



RESOURCE CONSERVATION AND RECOVERY ACT ENVIRONMENTAL INDICATOR CA725 REPORT

**PCC-VALIDATION
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LIST OF ACRONYMS

AISL	Acute Inhalation Screening Level
ACM	asbestos-containing materials
AMSL	above mean sea level
AOIs	Areas of Interest
AST	aboveground storage tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CBD	Central Business District
CCR	Current Conditions Report
CRA	Conestoga-Rovers & Associates
Csat	Soil Saturation Concentration Screening Level
DCC	Direct Contact Criteria
DSWD	Detroit Water and Sewerage Department
DWPC	Drinking Water Protection Criteria
DWC	Drinking Water Criteria
ELPO	Electrophoretic Deposition of Paint
ENCORE	Environmental Corporate Remediation
EPCRA	Emergency Planning and Community Right to Know Act
ERTK	Employee right to know
ESA	Environmental Site Assessment
FESL	Flammability and Explosivity Screening Level
FRDS	Federal Reporting Data System
FOIA	Freedom of Information Act
GCC	Groundwater Contact Criteria
GMC	General Motors Corporation
GCC	Groundwater Contact Criteria
GCPC	Groundwater Contact Protection Criteria
GSIC	Groundwater Surface Water Interface Criteria
GSIPC	Groundwater Surface Water Interface Protection Criteria
GTTR	Grand Traverse Railroad
GVIIC	Groundwater Volatilization to Indoor Air Inhalation Criteria
LIF	laser induced fluorescence
LBP	lead-based paint
LNAPL	light non-aqueous phase liquid
LUST	leaky underground storage tank
MDEQ	Michigan Department of Environmental Quality
MI	Michigan
MLC	Motors Liquidation Company
NWI	National Wetland Inventory
OCPC	Oakland County Planning Commission
PAOC	Potential Area of Concern
PAOR	Potential Area of Release
PCBs	polychlorinated biphenyls
PID	Photoionization detector

PNAAs	polynuclear aromatic hydrocarbons
PSIC	Particulate Soil Inhalation Criteria
PVC	Pontiac Validation Center
PWS	Public Water Supply
RACER	Revitalizing Auto Communities Environmental Response
RAP	Remedial Action Plan
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act
SVIIC	Soil Volatilization to Indoor Air Inhalation Criteria
SWMU	solid waste management unit
SVOCs	semi-volatile organic compounds
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
VOCs	volatile organic compounds
VSIC	Infinite Source Volatile Soil Inhalation Criteria
WMA	waste management area
WWTP	wastewater treatment plant

1.0 INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Environmental Indicator (EI) Report was prepared to fulfill provisions under Section VI.17.a of the 3008(h) Administrative Order on Consent (AOC), docket number RCRA-05-2011-0022, for the Revitalizing Auto Communities Environmental Response (RACER) Trust owned Pontiac Validation Center (PCC-Validation) located at 200 South Boulevard West in the City of Pontiac, Oakland County, Michigan (Site). The Site's United States Environmental Protection Agency (U.S. EPA) Identification Number is MID 980568836. The AOC, effective on September 3, 2011, included goals for completing the corrective Action EI determination for current human exposures (CA725) and migration of contaminated groundwater (CA750) by November 1, 2012 and March 1, 2013, respectively. In an email correspondence dated October 3, 2012 the USEPA and RACER agreed to extend the date for completing the CA725 determination by 90 days.

This document describes the technical approach, procedures, and results of the field activities associated with field work in accordance with the AOC. The information includes a comparison of the data with applicable MDEQ Part 201 Cleanup Criteria to identify whether there is a potentially significant release of hazardous waste or hazardous constituents from each Area of Interest (AOI) (or group of AOIs where they were grouped for investigation due to their proximity). Where a potentially significant release has been identified, the nature and extent of hazardous constituents in the environmental media characterized are discussed. In addition, current human exposures are assessed to provide a basis for determining whether the presence of these hazardous constituents poses an unacceptable risk to human health and the environment that would warrant corrective measures.

1.1 REPORT ORGANIZATION

This Report is organized as follows:

- Section 2.0 provides an overview, a summary of the AOIs, a summary of field investigations, and the general approach.
- Section 3.0 discusses the environmental setting regionally and in the vicinity of the Site, including information on surface water hydrology, geology, hydrogeology, background soil characteristics, land use, and groundwater use.
- Section 4.0 presents a summary and discussion of the field investigation results for each of the AOIs investigated as part of the Phase III Environmental Site Assessment (ESA) and Supplemental Phase III ESA. The discussion for each area investigated

includes a summary of the scope of the field investigations, a summary and evaluation of the data, and a discussion of whether a potentially significant release of hazardous constituents has been identified.

- Section 5.0 assesses current human exposures that evaluate the potential significance of reasonable maximum exposures to affected environmental media under current and reasonably expected future land use at and around the Site to determine whether corrective measures are warranted.
- Section 6.0 summarizes the conclusions, based on an evaluation of the of the field investigations.
- Section 7.0 lists the references cited in the Report.
- Tables and figures cited in the text of the Report are found at the end of the text.
- Appendix A contains the CA725 Form.
- Appendix B contains the soil boring logs and monitoring well construction logs for all of the soil borings and monitoring wells installed during Phase III ESA and Supplemental Phase III ESA.
- Appendix C contains summaries of the results of the data review and data validation performed by CRA during the Phase III ESA and the Supplemental Phase III ESA. The complete data deliverables provided by the laboratories that performed the analysis of the samples collected during the field investigations are available upon request.
- Appendix D contains a draft Background Soil Investigation Memorandum.
- Appendix E contains an LNAPL Memorandum describing the LNAPL investigation completed as part of the Phase III ESA and proposes a technically appropriate LNAPL management strategy.
- Appendix F contains ENVIRON's Quantitative Risk Assessment Results. ENVIRON performed a data screening and risk evaluation using soil, groundwater, and light non-aqueous phase liquid (LNAPL) data collected from historical and Phase II ESA results to identify potentially significant current and future exposures.

2.0 OVERVIEW

2.1 SITE DESCRIPTION

The Site is located at 200 South Boulevard West in the City of Pontiac, Oakland County, Michigan. Historical addresses associated with the Site have included 275 Franklin Street, 45399 Woodward Avenue, 600 and 660 South Saginaw Street, and (Lots 49 to 120 of the Woodward Estates Subdivision) located at the southeast corner of Howland Street and South Boulevard. The Site is comprised of asphalt paved parking areas, landscaped areas, Building 30, and concrete floor slabs remaining from the demolition of Plants 3, 4, and 5. Based on available information, the office building formerly located on the northern portion of the Site and the former aboveground storage tank (AST) farm located on the south parcel of the Site as stated in the 2009 Phase I ESA (CRA, 2009a) are no longer present. RACER is not currently conducting operations at the Site. A Site location map is presented on Figure 1 and a current Site plan is presented on Figure 2.

2.1.1 FACILITY SETTING

The Site is located in an area of mixed industrial, commercial, and residential land use. Based on the review of the City of Pontiac zoning map during the 2006 Phase I ESAs, the Site is zoned as M-2 Heavy Manufacturing and P-1 (Parking). Copies of a portion of the City of Pontiac Zoning map are presented in the 2006 and 2009 Phase I ESAs (CRA, 2006a, CRA, 2006b, and CRA, 2009a).

2.1.2 ADJACENT PROPERTIES

The surrounding areas are zoned as P-1 (Parking), M-2 (Heavy Manufacturing), R-1 (One Family Dwelling), R-2 (Two-Family and Terrace Dwelling), C-1 (Local Business), and C-3 (Fringe Central Business District (CBD) and Thoroughfare Frontage Business).

Additional information regarding the surrounding properties is available in the 2006 and 2009 Phase I ESAs (CRA, 2006a, CRA, 2006b, and CRA, 2009a).

2.2 HISTORICAL OPERATIONS

The CVO Parking and Product Vehicle Parking areas (located in the north portion of the Site) were located in the area of the former Plant 1. Plant 1 was purchased from the

Rapid Motor Company in 1906 and demolished in 1984. Based on the Phase I ESA (CRA, 2006), historical operations conducted at Plant 1 included metal finishing operations (plating, phosphating, pickling, heat treat, and painting), stamping, machining, grinding, polishing, solvent and oil storage, and several other manufacturing processes. Additionally, several underground storage tanks (USTs) and transformer substations were identified within the former Plant 1 area, along with a tunnel leading from a former adjacent Consumers Power Company facility. Building slabs and foundations reportedly remain beneath the existing paved parking areas.

GM acquired the former Plant 3 (located in the southwest portion of the Site) from the Wilson Foundry Company (Wilson) in 1940. According to historical documentation, Plant 3 was used by Wilson to manufacture motors and castings. Historical GM operations have included paint mixing, paint booths/ovens, a phosphate line, and hazardous waste storage. More recently, Plant 3 was referred to as the "Paint Shop", serving the entire complex. Plant processes included color painting; an 8-stage phosphate process located in the northeast corner; an electrode position paint operations (ELPO) dip tank centrally located along the western portion of the building; and paint storage and mixing operations in the basement along the south wall. A former powerhouse (Building 13) and former Buildings 12, 14, and 35 were located to the west of Plant 3.

The former Plant 4 (located in the southeast corner of the Site), reportedly acquired by GM from Wilson in 1937, consisted of Buildings 20, 25, 31, and 37. According to available information, Building 20 contained a spray booth and large in-ground conveyors. More recent operations have included a small test spray booth, plant maintenance, a lubricating oil fill station, an enclosed oil drum storage area, and small parts storage. Building 25 was used for material storage until the early 1970s, at which time it was converted to the G-Van body shop. More recently, Building 25 was utilized for welding operations. Historical operations at Building 31 have included a spray booth, material storage, and assembly for school buses. More recently, Building 31 was utilized for storage, shipping/receiving, quality assurance/quality control laboratories, and plant maintenance and miscellaneous repairs. Building 37 was previously used for assembly operations and as a body shop and, most recently, for equipment storage and maintenance activities.

GM reportedly acquired the former Plant 5 (located in the south-central portion of the Site) from Wilson in 1965. According to documentation reviewed by CRA, historical operations have included the manufacture of motors and castings, and machining operations. Most recently, GM utilized Plant 5 for the final assembly of small and mid-sized trucks.

Building 30 is located in the northeast corner of the Site and was constructed between 1964 and 1968. Building 30 is a long, rectangular one-story structure with high bay ceilings. While previous uses are unknown, the structure was used most recently for railcar loading/unloading operations and temporary parts/equipment storage, with railcars entering the north end of the building.

A switch yard and primary house belonging to Detroit Edison were previously located directly north of Plant 5, along with an industrial wastewater lift station. The industrial wastewater lift station included six large underground storage vaults. Wastewater was periodically pumped via five underground sewers to a neighboring GM facility (Pontiac Assembly Center [PAC]) for treatment.

Four fuel ASTs are located in a tank farm north of the industrial wastewater lift station. According to Site personnel, the ASTs will be emptied for decommissioning in April 2009. The tanks store gasoline and diesel fuel used to supply the adjacent dispensing pump, which dispenses fuel to company vehicles.

A Waste Management Area (WMA) was historically located adjacent to the north of the tank farm. This structure was used to store hazardous waste (up to 90 days) and non-hazardous waste prior to removal from the Site for disposal and for cleaning of empty drums. The structure was constructed on a sealed concrete containment pad with a self-contained spill collection sump, and is enclosed by a concrete curb with an access ramp.

Based on the Phase I ESA (CRA, 2006), and discussions with individuals associated with the Site, additional historical uses of the northern portion of the Site consisted of residential dwellings, commercial stores, and former Fire Station No. 2. West Wilson Avenue, previously known as West Foot Avenue, historically bisected the Site, running in an east-west direction. Additional uses of the southern portion of the Site consisted of: various commercial properties including a bank and a hospital, industrial properties including Flander's Electrical Company Incorporated (manufacturers of electric automobiles), Pontiac Drop Forge Company, the Wilson Foundry and Machine Company, and Detroit Weather Proof Body Company.

2.3 CURRENT OPERATIONS

The Site is vacant and no operations are conducted at the Site with the exception of investigation-related activities. A Site Plan is presented on Figure 2.

2.4 SUMMARY OF ENVIRONMENTAL INVESTIGATIONS AFTER IMPLEMENTATION OF THE AOC

Based on review of historical documents and CRA field investigations in 2009 and 2010, a draft CCR was completed in August 2011. The draft CCR identified 28 Areas of Interest (AOIs) at the Site based on a review of available files, interviews with Site personnel during the 2006 and 2009 Phase I ESAs, historical investigations and environmental activities described above. The twenty-eight AOIs include the following:

1. AOI 1 - Historical Operations – Former Plant 1
2. AOI 2 - Historical Operations – Plants 3, 4, and 5
3. AOI 3 - Historical Adjacent Properties
4. AOI 4 - USTs – Former Plant 1
5. AOI 5 - USTs - Plant 3
6. AOI 6 - USTs – Plant 4
7. AOI 7 - USTs – Plant 5
8. AOI 8 - Former Incinerator
9. AOI 9 - Tunnels
10. AOI 10 - Former Powerhouse
11. AOI 11 - Surficial Scarring
12. AOI 12 - Bare Soil Area
13. AOI 13 - WMA south of Plant 3
14. AOI 14 - AST Farm at Plant 1
15. AOI 15 - Potential Fill Pipes
16. AOI 16 - Bulk Loading/Unloading Areas
17. AOI 17 - Former Foundry Sand
18. AOI 18 - WMA at Plant 1
19. AOI 19 - Former Wastewater Treatment
20. AOI 20 - Former Transformers, Substations, and Large Capacitors
21. AOI 21 - Wastewater Lift Station and Process Lines
22. AOI 22 - Paint Mix Rooms
23. AOI 23 – Magnetometer Survey Anomalies in the Southern Parking Lot
24. AOI 24 – Below grade Pits, Trenches, Conveyors, and Sumps
25. AOI 25 – ASTs
26. AOI 26 – Releases to Sewers

- 27. AOI 27 – WMAs
- 28. AOI 28 – LNAPL Plume

Upon review and subsequent discussion with the USEPA, a Supplemental CCR was submitted to the EPA on December 12, 2011. The Supplemental CCR provided the rationale identifying which AOIs warranted additional investigation as part of the Phase III ESA. The Supplemental CCR recommended the following AOIs for further investigation:

- AOI 1 – Historical Operations – Former Plant 1
- AOI 2 – Historical Operations – Former Plants 3, 4, 5
- AOI 5 – USTs – Former Plant 3
- AOI 12 – Bare Soil Areas
- AOI 20 – Former Transformers Substations, and Large Capacitors
- AOI 21 – Wastewater Lift Station and Process Line
- AOI 22 – Paint Mix Rooms
- AOI 26 – Release to Sewers
- AOI 28 – LNAPL Plume

2.5 PHASE III ESA, AUGUST 2012

In August 2012, the EPA approved the Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan dated August 20, 2012 (SAP/QAPP). The SAP/QAPP was developed to investigate eight of the AOIs identified in Table 5.3 of the December 2011 Supplemental CCR. One AOI identified in the Supplemental CCR was not investigated as part of the Phase II ESA as described below:

- AOI 21 (Wastewater Lift-Station and Process Line) will not be investigated because elevated concentrations of on-Site metals in soils are below Site-specific background concentrations and the exact location of the off-Site October 1986 process line spill along the Grand Trunk Railroad was unable to be located

The Phase III ESA field activities were completed from August 17 through August 30, 2012 and included the installation of 14 soil borings, eight groundwater monitoring wells and two LNAPL recovery wells. The field work was completed to address eight AOIs and included the analysis of 40 soil samples (including three duplicates), and 16 groundwater samples (including one duplicate) and two soil cores. The soil cores were collected for LNAPL testing.

2.5.1 SUPPLEMENTAL PHASE III ESA, DECEMBER 2012

Prior to field work, the USEPA approved a supplemental scope of work in a correspondence email dated November 29, 2012. Based on results of the 2012 Phase III ESA and previous investigations, additional field work was completed at six AOIs as summarized below:

- AOI 1 - Potential off-Site volatile organic compounds (VOC) groundwater impacts above DWC.
- AOI 2 - VOCs in groundwater above Drinking Water Criteria (DWC) and GSI.
- AOI 12 - Polynuclear aromatic hydrocarbons (PAHs) in shallow soils above Residential direct contact criteria (DCC) and GSI.
- AOI 20/22 - PAHs in groundwater above GSI.
- AOI 28 - Collect LNAPL saturated soils for analytical characterization.

The Supplemental Phase III ESA field activities were completed from December 3 through December 7, 2012 and included the installation of eight soil borings, three groundwater monitoring wells and eight temporary monitoring wells. Two temporary monitoring wells (TMW3S-12 and TMW4S-12), did not produce enough groundwater for a sample. Therefore, during installation of TMW3I-12 and TMW4I-12 (located within 1 foot of TMW3S-12 and TMW4S-12), a soil sample was collected from the shallow monitoring zone. In total, six groundwater samples and two soil samples were collected from the installation of the eight temporary monitoring wells. In total, 14 soil samples (including one duplicate), and nine groundwater samples were collected to address the six AOIs stated above.

The additional field work followed methods and procedures (including drilling techniques, sample handling, field documentation requirements, field and laboratory analytical methods and QA/QC procedures) outlined in the approved SAP/QAPP.

2.6 OVERALL METHODOLOGY

The overall methodology, objectives and approach were described in the SAP/QAPP. The methods are described below and are applicable to the Phase III ESA and Supplemental Phase III ESA activities.

2.6.1 SOIL BORING INSTALLATION

A Geoprobe® drill rig or direct push technology (DPT) was utilized for soil borings to a maximum of 30 feet bgs. Using DPT, continuous soil samples will be collected in 4- or 5-foot long Macrocore samplers with disposable acetate liners. Soils were continuously logged from the surface to the bottom of each borehole. The sample interval submitted to the laboratory for chemical analysis was a designated interval based on previous results or determined in the field, based on field evidence of impact. Field evidence of impact was identified based on the interval with the highest indication of organic vapors and/or visual and/or incidental olfactory evidence. When no organic vapor, visual, or incidental olfactory evidence of impacts was observed/identified, the sample was collected from the 2-foot interval at least 1 foot above the saturated zone or the lower most interval of the soil boring (if the saturated zone was not encountered).

2.6.2 MONITORING WELL INSTALLATION

Monitoring wells were installed using hollow-stem auger drilling equipment. Based on data collected during CRA's 2009 Phase II ESAs, monitoring wells were screened in the sand layers or the interface between glacial clay and silt and sand layers.

The monitoring wells were constructed using a 2-inch diameter, 5-foot long, machine slotted 0.010-inch, polyvinyl chloride (PVC) well screen threaded to a 2-inch diameter PVC riser extending to just below ground surface. A #5 Global silica sand was placed in the annulus to approximately 2 feet above the well screen. Bentonite chips were placed above the sand pack and properly hydrated to create a seal. A flush-mount protective casing was set into concrete to complete the well. Upon completion, the monitoring wells were developed to a generally silt free condition.

2.6.3 TEMPORARY MONITORING WELL INSTALLATION

Temporary monitoring wells were installed using Geoprobe drilling equipment. Based on data collected during the 2012 Phase III ESA, temporary monitoring wells were screened in the sand layers or the interface between glacial clay and silt and sand layers.

The monitoring wells were constructed using a 1-inch diameter, 5-foot long, machine slotted 0.010-inch, polyvinyl chloride (PVC) well screen threaded to a 1-inch diameter PVC riser extending to just below ground surface. A #5 Global silica sand was placed in the annulus to approximately 2 feet above the well screen. Bentonite chips were placed above the sand pack and properly hydrated to create a seal. Upon completion, the monitoring wells were developed to a generally silt-free condition (if possible).

2.6.4 NAPL WELL INSTALLATION

NAPL wells were installed using hollow-stem auger drilling equipment. The wells were constructed at designated depths based on previous LIF results. The monitoring wells were constructed using a 4-inch diameter, 10-15-foot long machine slotted 0.010-inch, polyvinyl chloride (PVC) well screen threaded to a 4-inch diameter PVC riser extending to just below ground surface. A #5 Global silica sand was placed in the annulus to approximately 2 feet above the well screen. Bentonite chips were placed above the sand pack and properly hydrated to create a seal. A flush-mount protective casing was set into concrete to complete the well. The monitoring wells were developed to the extent possible. Given that they were installed in the LNAPL area.

2.6.5 GROUNDWATER ELEVATION MEASUREMENTS

Manual water level measurements were made using an electronic depth-to-water probe accurate to ± 0.01 foot and recorded in the field logbook. Water level measurements were converted to groundwater elevations by subtracting the measurements from the elevation of the measuring points. Hydraulic monitoring was conducted prior to sampling the monitoring wells. If LNAPL was encountered, depth-to-LNAPL and depth-to-groundwater were measured using an electronic interface probe accurate to ± 0.01 foot and recorded in the field logbook.

2.7 SAMPLE COLLECTION PROCEDURES

The following sections detail the sampling procedures for the Phase III ESA and Supplemental Phase III ESA. The sampling procedures were outlined in the approved SAP/QAPP.

2.7.1 SOIL SAMPLING

Soil sampling was completed using the procedures specified below:

1. A new pair of disposable nitrile gloves (or equivalent) was donned for each set of samples collected at each location.
2. Borings were advanced to pre-determined depth below grade as described in Section 2.4. Any surficial debris (i.e., grass cover) was removed from the area

where the sample was collected using a separate pre-cleaned device. The soil borings were completed using a Geoprobe® drill rig with direct push technology and pre-cleaned acetate liners. At each location, soil samples were continuously collected and described, classified and characterized using the Unified Soil Classification System (USCS). Soil samples were visually inspected for the presence of staining and field screened with a Photoionization Detector (PID).

3. Soil samples from the same depth interval designated for sample analysis were collected into the appropriate pre-cleaned, laboratory-supplied containers using decontaminated stainless-steel spatulas or disposable wooden tongue blades (e.g., tongue depressors). Sample labeling, documentation, and shipping procedures were consistent with requirements specified in Section 4.1 of the SAP/QAPP.
4. Soil samples collected for VOC analysis were retrieved directly from minimally disturbed soil using Terra Core Samplers® and placed directly into pre-cleaned vials with methanol consistent with U.S. EPA SW-846 Method 5035 requirements. Sample labeling, documentation, and shipping procedures were consistent with requirements specified in Section 4.1 of the SAP/QAPP.

2.7.2 GROUNDWATER SAMPLING

Each of the groundwater wells was developed prior to the first sampling event. Groundwater samples were collected from monitoring wells using the procedures specified below:

1. A new pair of disposable nitrile gloves (or equivalent) was donned at each location.
2. Measure the depth to water in each well to the nearest 0.01 foot using a pre-cleaned electronic depth-to-water water probe. Well depth was obtained from the well log.
3. Purging was conducted using a peristaltic pump and dedicated tubing (groundwater elevations correspond to water table depths on the order of 2.5 to 17.5 feet bgs; therefore, use of peristaltic pumps for sampling shallow groundwater is considered acceptable).
4. Purged the monitoring well at a pumping rate of between 100 and 200 milliliters per minute (mL/min).
5. Measured water field parameters approximately every 5 minutes using a field water quality meter.

6. Continued purging until stabilization is achieved. Stabilization is achieved after all parameters have stabilized for three consecutive readings and are within the following limits:
 - pH: ± 0.2 pH units of the median value of the three readings
 - Conductivity: ± 10 percent of the median value of the three readings
 - Temperature: ± 10 percent of the median value of the three readings
 - ORP: ± 10 millivolts (mV) of the average value of the three readings
 - DO: ± 10 percent of the average value of the three readings
 - Turbidity: ± 10 percent of the average value of the three readings, or a final value of less than 5 NTU

If stabilization is not achieved after 3 well volumes, the purging and recording of field parameters will continue to a maximum of 5 well volumes.
7. Collected groundwater through the tubing directly into laboratory-supplied containers in order of decreasing analyte volatility using techniques that minimize sample agitation. Sample labeling, documentation, and shipping procedures will be consistent with requirements specified in Section 4.1 of the SAP/QAPP.
8. In the event that the groundwater recharge to the monitoring well was insufficient, the well was pumped dry, and groundwater was allowed to recover to a level sufficient for sample collection. Upon recovery, groundwater samples were collected as described in Item 7. If the well does not recover within 24 hours, it was considered dry and not sampled.

2.7.3 SOIL CORE SAMPLING AND CORE PHOTOGRAPHY

Once at the appropriate depth below ground surface, soil cores were collected using the Geoprobe Macrocore sampling system. Macrocore samples were collected in 2-inch diameter, 5-foot long, clear acetate liners. In general, one or two 5-foot long cores were collected from each borehole to obtain a 5- to 10-foot vertical soil profile across the LNAPL impacted zone. Upon retrieval from the ground, the cores were sealed at each end to prevent fluid loss, stored on dry ice to freeze the cores and preserve the pore fluids, and shipped to a laboratory for soil core photography and subsequent mobility testing.

Core photography was performed consistent with American Society for Testing and Materials International (ASTM) D5079. More specifically, frozen soil cores were cut open along the vertical length of the sample tube to enable photographs to be taken of

the soil cores. Soil cores were allowed to partially thaw along the surface prior to photographing. The partial thawing allowed the LNAPL, where present, to pool to the surface of the profile. Photographs were taken in both white light and ultraviolet (UV) light. The white light photographs displayed the natural state (color, texture) of the soil profile including any pooled LNAPL, where applicable. The UV photos were used to identify LNAPL by the principle that LNAPL tends to fluoresce when exposed to UV light. For a given pairing of LNAPL and LNAPL-impacted soil type, the intensity of fluorescence was proportional to the amount of LNAPL, with higher intensities corresponding to greater LNAPL saturations. UV photos also provided qualitative information regarding the type of LNAPL. The UV photos are presented as part of a discussion of LNAPL in Appendix E.

2.8 SPOILS/INVESTIGATIVE DERIVED WASTE MANAGEMENT

During implementation of the above activities, various types of waste were generated including soil cuttings, decontamination water and purge water. The soil cuttings were collected into DOT approved 55-gallon drums or other suitable containers for temporary storage prior to characterization and off-Site disposal. The water from groundwater sampling and decontamination activities were collected into DOT approved 55-gallon drums or other suitable containers for temporary storage prior to characterization and off-Site disposal.

General refuse, including plastic sheeting, buckets, paper bags, personal protective equipment (PPE) etc., was collected in plastic bags and disposed of in waste receptacles on a regular basis.

2.9 SURVEYING

Following the Phase III ESA, a survey was completed by a licensed surveyor. Monitoring well locations were surveyed to a temporary, on-Site benchmark for development of a Site plan and groundwater contour map. The survey included ground-surface elevations at each soil boring and monitoring well, as well as monitoring well top-of-casing elevations at each monitoring well.

3.0 ENVIRONMENTAL SETTING

3.1 REGIONAL ENVIRONMENTAL SETTING

The Site is located in the City of Pontiac, Oakland County, in southeast Michigan. Oakland County is within the Central Lowlands portion of the Great Lakes Basin. Regional topography is variable, ranging from upland moraines to low-lying till plains and glacial outwash. The regional land surface slopes from the northwest to the southeast. Maximum topographic relief within Oakland County is approximately 360 feet (Westjohn and Weaver, 1998).

The regional overburden is primarily dominated by Quaternary-aged glacial drift, glaciolacustrine deposits, and glacial outwash deposits of Pleistocene age. The glacial deposits thickness for the City of Pontiac area is generally greater than 300 feet (Ferris, Burt, Stramel, and Crosthwaite, 2003). The glacial drift, glaciolacustrine, and glacial outwash deposits for the City of Pontiac region are underlain by a thick section of clay, sandy clay, and gravelly clay that separates a layer of buried outwash. This clay sequence is less permeable than the surrounding glacial drift and, therefore, acts as a confining layer (Ferris, Burt, Stramel, and Crosthwaite, 2003). The buried outwash ranges from 20 feet to 150 feet thick and overlies the bedrock throughout the region. The regional bedrock is from the Coldwater Shale Formation, which is approximately 400 feet thick, locally encountered at approximately 650 feet AMSL, and contains shales, sandy shales, and shaly sandstone.

The Site is located within the Clinton River and Rouge River drainage basins. The Clinton River is located approximately 0.75 miles north of the Site while the Rouge River is located approximately 3.5 miles southeast of the Site. Several surface water bodies and intermittent drains are also located within a mile of the Site, including Crystal Lake, which is approximately a half mile to the west of the Site. These water bodies are part of the Clinton River watershed which ultimately migrates east over a minimum distance of 26 miles towards the St. Clair River, and becomes part of the Great Lakes water system.

As part of the environmental database search during the 2009 Phase I ESA, a records search of the Federal USGS Well Information, Federal Reporting Data System (FRDS) Public Water Supply (PWS) System, and State databases of well information for wells located within approximately one mile of the Site. One Federal FRDS well, eight Federal USGS wells, and no state wells were identified within one mile of the Site (CRA, 2009a). A search of the MDEQ Water Well Record Retrieval System has been conducted for well records within a 1-mile radius of the Site; however, analysis of the water well records search is pending.

Groundwater resources exist with two separate aquifers in Oakland County, including the glacial drift and the bedrock aquifers. Marshall Sandstone is the main bedrock aquifer in Oakland County (Aichele, 2005). However, the primary water source for Pontiac area is from surface water from the Clinton River watershed and the Detroit Water and Sewerage Department (DWSD) (Aichele, 2000).

Additional information regarding the regional environmental setting is presented in the 2006 Phase I ESAs and 2009 Phase II ESA (CRA, 2006a, CRA, 2006b, and CRA, 2009a).

3.2 SITE GEOLOGY AND HYDROGEOLOGY

3.2.1 GEOLOGY

The geologic (stratigraphic) framework for the Site was defined from a review of stratigraphic and instrumentation logs from the previous Phase II ESA investigation along with additional instrumentation logs from the Phase III ESA and Supplemental Phase III ESA investigations. The Phase III ESA and Supplemental Phase III ESA stratigraphic logs are provided in Appendix B. The stratigraphic logs from the Phase II ESA are provided in the Phase II ESA investigation report.

During the Phase III ESA, 21 soil borings were conducted across the Site. Ten of the 21 soil borings were converted into permanent monitor wells. An additional 16 soil borings were conducted during the Supplemental Phase III ESA. Of the 16 soil borings, three were converted into permanent monitor wells and six of the soil borings were converted into temporary monitor wells. The soil borings conducted during the Phase III ESA and the Supplemental Phase III ESA were primarily terminated between 5 to 25 feet bgs with the deepest soil boring extending to approximately 40 feet bgs at MW79-12. The deepest soil boring conducted on site extended approximately to 60 feet bgs at MW28-07, conducted during the Phase II ESA.

Three geologic cross-sections were prepared utilizing the subsurface data obtained from the Site investigations. The locations of the geologic cross-sections are shown on Figure 3. Geologic cross-sections A-A' (north-south across the Site), B-B' (west-east along the southern portion of the Site), and C-C' (west-east across the northern portion of the Site) are presented on Figures 4, 5, and 6, respectively. Based on the distribution of the stratigraphic data shown on the geologic cross-sections, the main layers that underlie the Site to the maximum depth of investigation of 40 feet bgs are: fill and debris at the surface to a maximum depth of approximately 20 feet in some areas, over a clay unit with intermittent sand and silt lenses, followed by a sand unit that tended to extend across the site to the north and south (see x-section A-A') that ranged in thickness to

from 5 to 20 feet, over a regionally extensive clay unit to the maximum depth investigated.

The fill layer tends to exist with varying amounts of concrete, asphalt, wood, and brick debris. The thickness of this fill layer varies, but is generally between 0.5 feet to as great as 20 feet. The fill material is poorly to moderately graded, quite loose in terms of compaction, and ranges in color from brown to black. This layer is generally dry to moist, but is also a water-bearing unit.

Clay deposits were encountered below the fill material, extending to the depth of investigation (approximately 40 feet bgs and to 60 feet bgs during the Phase II ESA investigation). Stratigraphically isolated and discontinuous sand layers were encountered within this clay/silt glacial deposit.

The sand layers occur at various depths and range in thickness from 0.25 feet to a maximum thickness of 20 feet at BH9-07 (shown near the northernmost portion of geologic cross-section A-A').

The deep stratigraphy sequence at the Site was not investigated since the maximum depth of investigation was approximately 40 feet bgs during this investigation and approximately 60 feet bgs during the Phase II ESA. However, regional stratigraphic data indicated that the clay/silt glacial deposits and other fine-grained materials of glacial origin extend to the bedrock at depths of approximately 650 feet AMSL. According to regional information of Oakland County, a layer of buried outwash exists between the clay/silt glacial deposits and the bedrock (Ferris, Burt, Stramel, and Crosthwaite, 2003). Bedrock beneath the Site consists of Early Mississippian Coldwater Shale Formation, a gray to blue-gray shale.

3.2.2 HYDROGEOLOGY

The majority of the overburden beneath the Site is underlain by fine-grained material of the clay/silt glacial deposits and subordinate layers of sand. The hydrogeologic behavior of the overburden would therefore be controlled by the hydraulic (i.e., permeability or hydraulic conductivity) properties of the clay and silt material.

Vertical hydraulic conductivity values of the fine-grained material calculated by the Flexible Wall Permeameter (Constant Head Method ASTM D-5084) range from 1.4×10^{-7} to 1.5×10^{-8} centimeter per second (cm/sec), and are typical for this type of glacial environment. Horizontal hydraulic conductivity values for the fine-grained material would be approximately one order of magnitude less (Freeze and Cherry, 1979) or on

the order of 1×10^{-6} to 1×10^{-7} cm/sec. The clay materials provide a very good aquitard to the downward migration of groundwater. Although not measured, the hydraulic conductivity of the sand layers would be 1×10^{-3} cm/sec based on the textural nature of these layers (Freeze and Cherry, 1979).

It should be noted that the majority of the groundwater monitoring wells are screened primarily in the coarser-grained (sand layers) deposits or straddling the interface between the fine-grained and coarse-grained deposits at shallow depths (less than 15 feet bgs), equivalent to an approximate elevation of 935 feet AMSL or higher. This represents the shallower groundwater environment or the depths where groundwater was first encountered during drilling. Other wells were installed at deeper levels within the clay/silt glacial deposits primarily to screen the sand layers found at greater depths.

Groundwater contours were generated using the groundwater elevations measured on December 2, 2012 and are presented on Figure 7. The groundwater flow patterns show a general trending flow to the north or northwest with depression near former Building 17 and the LNAPL area followed by a mounding area to the northeast. In general, the groundwater gradient trends to the north-northwest.

Groundwater elevations in the shallow clay/silt glacial deposits range from about 955 feet AMSL at the extreme southeast part of the Site to about 935 feet AMSL at the extreme northern portion of the Site. These elevations correspond to water table depths on the order of 1.5 to 15.5 feet bgs.

As shown on Figure 7, groundwater flows generally to the north-northwest and generally follows the ground surface topography.

3.3 BACKGROUND SOIL CHARACTERIZATION

During the 2009 Phase II ESA, CRA completed a Background Soil Investigation to establish Site-specific background concentrations for metals in native soil. The Site-specific concentrations were developed using statistical calculation procedures presented in the 2002 MDEQ guidance document entitled "Sampling Strategies and Statistics Training Materials" for Part 201 Cleanup Criteria. A Draft Background Soil Investigation Memorandum was completed in 2009 outlining the procedures. It is included as Appendix D in this report.

3.4 WATER SUPPLY AND GROUNDWATER USE

The City of Pontiac's source water comes from the lower Lake Huron watershed, Lake Huron Water Treatment Plant in Port Huron. The Site and likely the surrounding properties are exclusively provided with municipal water as a source of drinking water, and it is not anticipated that future drinking water wells will be installed in the vicinity of the Site.

3.5 ECOLOGY

CRA obtained and reviewed the National Wetlands Inventory Map (NWIM) for the Site. No wetlands were mapped for the Site. A copy of the NWIM is presented in Appendix B of the Phase I ESA (CRA, 2006a).

There is adequate information to conclude that ecological risks are negligible at the Site. The Site is a formerly active industrial property that has relatively recently undergone decommissioning and demolition. The Site is located in an area of mixed industrial and commercial properties and residential neighborhoods. Almost all the land within the confines of the property was formerly developed and now consists of concrete pads and foundations, or regraded or otherwise disturbed surfaces as a result of recent Site activities. Only a small portion (i.e., approximately 10 percent) of the land within the Site property is undeveloped. No sensitive environments or protected species are known to occur in the Site vicinity.

4.0 INVESTIGATION RESULTS AND DISCUSSION

This section describes the results of the Phase II ESA, Phase III ESA and Supplemental Phase III ESA. Sections 4.2 through 4.8 describe the results of the investigative activities for each of the eight AOIs investigated.

Following the Phase II ESA, a Data Evaluation was completed by Environ (December 19, 2008) which incorporated a baseline screening against generic Part 201 criteria and a subsequent risk assessment to identify potentially significant current and future exposures. The data used in the evaluation included those collected from 1989 through 2008; however, the data collected in 2007 and 2008 were believed to be the most representative of current conditions at the Site. The Data Evaluation is presented in Appendix F. Based on the Data Evaluation, soil, groundwater, and LNAPL data used in the evaluation did not indicate a potential for significant worker exposures at the Site, with the exception of xylene concentrations in soil south of Building 17 (AOI 5) and chloromethane concentrations in LNAPL north of Building 17 (AOI 28). The xylene concentrations were historical (1989) and were investigated as part of the Phase II, with no impacts identified. The chloromethane was investigated as part of the Phase III ESA with no exceedances of applicable criteria identified in monitoring wells or groundwater samples associated with AOI 28.

4.1 APPLICABLE COMPARISON CRITERIA FOR INVESTIGATIONS

Future land use restrictions proposed for the Site include a Site-wide deed restriction to prevent use of groundwater, limit future Site use to non-residential uses and require vapor barriers and/or vapor intrusion assessments prior to construction for any new buildings. These restrictions will prevent complete exposure pathways for the soil volatilization to indoor air criteria (SVIIC), groundwater volatilization to indoor air criteria (GVIIC), drinking water criteria (DWC) and drinking water protection criteria (DWPC). Therefore, as identified in the 2012 Supplemental CCR, no further investigation is required for an AOI with SVIIC, GVIIC, DWC and DWPC pathway exceedances. Also, as identified in the draft CCR, groundwater to surface water interface (GSI) pathway was evaluated for the Site and the conclusion was reached that the GSI pathway does not apply at the Site.

Based on the intended land use (Nonresidential), and Site specific characteristics described above, the following Nonresidential criteria are applicable for the Site:

- Soil:
 - Groundwater Contact Protection Criteria (GCPC)

- Volatile Soil Inhalation Criteria (VSIC)
- Particulate Soil Inhalation Criteria (PSIC)
- Direct Contact Criteria (DCC)
- Soil Saturation Concentration Screening (C_{sat})
- Groundwater:
 - Groundwater Contact Criteria (GCC)
 - Water Solubility
 - Flammability/Explosivity Screening Level (FESL)
 - Acute Inhalation Screening Level (AISL)

The analytical data for soil and groundwater compared to all Part 201 criteria are presented in Tables 3-14, respectively. Site-specific background concentrations for metals in native soil were used for comparison to background (Appendix D). Although the applicable criteria for the Site do not include Residential pathways, DWC or GSI, the analytical data north of the property boundary as part of AOI 1 was compared to all Part 201 criteria, due to the potential for off-Site migration. Special considerations were also given to wells near the property boundaries.

Eight AOIs were investigated during the Phase III ESA and Supplemental Phase III ESA. The 2012 Supplemental CCR presents a table of AOIs, a brief summary of the AOIs, and whether further investigation is recommended. Locations of the eight AOIs are presented on Figure 2.

4.2 AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1

BACKGROUND

Based on the review of available information, former Plant 1 was initially developed in 1906 by the Rapid Motor Car Company, with subsequent additions to the facility over the years. The Rapid Motor Car Company, and later General Motors Corporation, utilized former Plant 1 for the manufacture and assembly of vehicles. Primary operations conducted at former Plant 1 included metal finishing operations (phosphating, pickling, plating, heat treating, and painting), stamping, grinding, machining, and polishing. Ancillary operations included hazardous and non-hazardous waste accumulation, handling, and storage, as well as the use and storage of raw petroleum products and solvents in both above and belowground storage tanks and drums. Former Plant 1 was razed in sections, with demolition occurring between 1972 and 1974 for Buildings 1A, 1B, 1C, 1D, and 2; between 1974 and 1980 for Buildings 2B, 6,

10, and 13; and the remainder of the Plant circa 1984. According to individuals associated with the Site, demolition debris from former Plant 1 was utilized as backfill for below grade structures associated with former Plant 1. Portions of the former Plant 1 portion of the Site were previously utilized as residential and commercial properties as early as 1909. No information regarding historical use of heating oil USTs or ASTs, septic systems, or property demolition procedures were available for CRA to review.

During the Phase II ESA, soil borings BH-1-07, MW-2-07, MW-7-07, MW-4-07, BH-5-07, MW-7-07, MW-11-07, BH-18-07, MW-19-07, MW-20-07, and BH-24-07 were advanced to investigate potential impacts to the Site associated with the historical operations at Plant 1. Monitoring wells were installed at MW-2-07, MW-4-07, MW-7-07, MW-11-07, MW-19-07, and MW-20-07 based on the presence of groundwater during soil boring advancement; however, insufficient groundwater was present in well MW-20-07 at the time of sampling to obtain a groundwater sample.

Groundwater impacts were encountered at MW2-07 which included PCBs above GSIC and Residential and Nonresidential DWC and TCE above Residential and Nonresidential DWC.

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

During investigation of the off-Site monitoring wells, there was limited availability to place a monitoring well directly down gradient from MW72-08. The adjacent right-of-way located directly down gradient from the Site had limited access and CRA was not granted permission to place a monitoring well north of the sidewalk from the City of Pontiac.

Soil investigation: Soil samples were collected from temporary monitoring wells TMW3I-12 and TMW4I-12 and permanent monitoring well MW79-12. The locations are presented on Figure 8. Soil boring logs are presented in Appendix B.

A sample key for the soil samples collected is presented in Table 2. Five discrete soil samples (one from TMW3I-12 and TMW4I-12; and three from MW79-12) were submitted for laboratory analysis. Soil samples collected from the temporary monitoring wells were analyzed for VOCs. Soil samples collected from MW79-12 were analyzed for VOCs, and PCBs.

Groundwater investigation: Six temporary monitoring wells (TMW1S-12, TMW1I-12, TMW2S-12, TMW2I-12, TMW3I-12 and TMW4I-12) and three permanent monitoring wells MW79-12, MW80-12 and MW81-12 were installed to investigate groundwater

conditions near MW2-07. The location of each well is presented on Figure 9. A sample key for the groundwater samples collected is presented in Table 2. Six groundwater samples were collected and analyzed from the TMWs mentioned above for VOCs and groundwater samples were collected from MW2-07, MW79-12, MW80-12 and MW81-12 and analyzed for VOCs and PCBs.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 1 are summarized in Table 3. According to Table 3, no contaminants exceeding applicable Part 201 criteria were detected in soil at AOI 1.

Although no soil sample exceeded applicable Part 201 Criteria, soil collected from the right of way (ROW) or off-site borings were compared to all MDEQ cleanup criteria because the off-site locations are not subject to future land restrictions. Benzene was detected at TMW4I-12, at concentrations exceeding Residential and Non-Residential Drinking Water Protection Criteria (DWPC). Figure 8 presents the exceedances of applicable Part 201 criteria for soil at AOI 1 and the off-Site locations compared against all MDEQ criteria.

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 1 are summarized in Table 4. According to Table 4, no contaminants exceeding applicable Part 201 criteria were detected in groundwater in AOI 1.

Although no groundwater sample exceeded applicable Part 201 Criteria, groundwater collected from temporary monitoring wells in the ROW and off-site wells were compared to all MDEQ cleanup criteria. Therefore, trichloroethene (TCE) was detected at TMW2I-12 above Residential Drinking Water Criteria (DWC) and Non-Residential DWC. Iron and manganese was detected at MW80-12 above Residential and Non-Residential DWC. Aluminum, iron, manganese, selenium and silver were detected above Residential and Non-Residential DWC and/or groundwater surface water interface (GSI) at MW81-12. Figure 9 presents the exceedances of applicable Part 201 criteria for groundwater for AOI 1 and the off-site groundwater data compared against all MDEQ Cleanup Criteria. It should be noted, that although a soil sample collected from TMW4I-12 had a concentration of benzene exceeding DWPC, the corresponding groundwater sample did not exceed DWC.

4.3 AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4 AND 5

BACKGROUND

Based on the review of available information, the area formerly occupied by Plants 3, 4, and 5 was developed as early as 1915 as Flander's Electrical Company Inc. (manufacturers of electric automobiles); Pontiac Drop Forge Company; the Wilson Foundry and Machine Company; and/or Detroit Weather Proof Body Company, with subsequent additions/changes to the facilities over the years. Primary operations conducted on this portion of the Site included degreasing, drop forging, metal finishing operations, casting, incinerating, stamping, grinding, and machining. Ancillary operations included hazardous and non-hazardous waste accumulation, handling, and storage, as well as the use and storage of raw petroleum products and solvents in both above and belowground storage tanks and drums. Portions of the Wilson Foundry were noted on Sanborn Fire Insurance maps to have an earthen floor. Staining was historically observed and excavated west of former Plant 5 and an eight stage phosphate system was investigated in 1997 in former Plant 3. Based on information reviewed during the 2006 Phase II ESA, releases historically had occurred from various operations at the plants.

During the 2009 Phase II ESA, soil borings BH-30-07, MW-32-07, BH-41-07, BH-42-07, BH-44-07, MW-48-07, BH-61-08, BH-62-08, MW-63-08, MW-64-08, BH-65-08, BH-67-08, MW-68-08, MW-69-08, MW-69-08, TMW-70-08, MW-74-08, MW-78-08, BH-79-08, TMW-81-08, BH-82-08, BH-83-08, and TMW-87-08 were advanced to investigate potential impacts to the Site associated with the historical operations. Monitoring wells and temporary monitoring wells were installed at MW-32-07, MW-48-07, MW-63-08, MW-64-08, MW-68-08, MW-69-08, TMW-70-08, MW-74-08, MW-78-08, TMW-81-08, and TMW-87-08 based on the presence of groundwater during soil boring advancement; however, insufficient groundwater was present in wells MW-69-08, TMW-70-08, MW-74-08, and TMW-87-08 at the time of sampling to obtain groundwater samples.

Sudan IV field test at BH79-08 indicated the potential for LNAPL. In addition, Semi-volatile organic compounds (SVOCs) were detected above water solubility in groundwater at MW74-08, located in the northeastern portion of former Plant 3.

PHASE III ESA AND SUPPLEMENTALPHASE III ESA

During the 2012 Phase III ESA, the potential LNAPL was investigated by installing one soil boring (BH97-12) near BH79-08. Monitoring well MW74-08 was re-sampled to investigate SVOC impacts.

Soil investigation: Soil samples were collected from boring BH97-12. The location is presented in Figure 10. The soil boring log is presented in Appendix B.

A sample key for the soil samples collected is presented in Table 2. Three discrete soil samples from BH87-12 were submitted for laboratory analysis. Soil samples collected from BH97-12 were analyzed for VOCs, SVOCs and PCBs.

Groundwater investigation: Monitoring well MW74-08 was re-sampled to investigate historic VOC and SVOC impacts. Analytical results from the Phase III ESA indicated VOCs exceeded DWC and GSI. Currently, groundwater is delineated to the north, west and southwest. To delineate VOCs in groundwater, one groundwater monitoring well (MW91-12) was installed approximately 150 feet east and one groundwater monitoring well (MW90-12) was installed approximately 150 feet south of MW74-08. Samples were collected and analyzed for VOCs. Monitoring well MW90-12, located approximately 150 feet south of MW74-08 also served to evaluate the eastern extent of impacts for AOIs 20 and 22 (See sections below). Monitoring well locations are presented on Figure 11.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 2 are summarized in Table 5. According to Table 5, no contaminants exceeding applicable Part 201 criteria were detected in soil at AOI 2. Figure 10 presents the results compared against applicable Part 201 criteria.

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 2 are summarized in Table 6. According to Table 6, groundwater analytical results indicate that Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene and Indeno(1,2,3-cd)pyrene were detected at MW74-08 at concentrations exceeding GCC and/or Water Solubility in a sample collected and analyzed in 2008. During the Phase III ESA, the well was re-sampled and analytical results were below applicable MDEQ Cleanup Criteria. In addition, results were below applicable Part 201 criteria from groundwater collected at MW90-12 and MW91-12. Figure 11 presents the exceedances of applicable Part 201 criteria for groundwater for AOI 2.

4.4 AOI 5 - USTS - FORMER PLANT 3

BACKGROUND

Based on the review of available information, at least 14 historic USTs were present in the vicinity of former Plant 3. No information regarding closure of four of these tanks (i.e., removed, abandoned in place, etc.) of the aforementioned USTs at Plant 3 was available. The remaining 10 USTs were removed and at least five received closure from the MDEQ. During closure of the tanks, samples were collected for analysis for BTEX, PNAs, PCBs, lead, cadmium, and/or arsenic; however, a complete VOC and SVOC analysis was not conducted. Based on a review of historic information, residual impacts are present at the Site in groundwater at concentrations above Residential and Non-residential DWL, GSIC, and water solubility criteria, and in soil at concentrations above GSIPCL, DWPL, Csat, Residential and Nonresidential DWL, SVIIC, VSIC, DCC, and Residential PSIC.

During the 2009 Phase II ESA, soil borings MW-33-07, MW-34-07, BH-36-07, MW-37-07, MW-40-07, MW43-07, BH-89-08, BH-90-08, and BH-94-08 through BH-96-08 were advanced throughout the former Plant 3 to investigate potential impacts associated with historic USTs. Soil samples were not collected from soil borings BH-94-08 and BH-95-08 based on negative jar test results and low PID readings, and given that additional subsurface data in the vicinity had already been collected (e.g., MW-43-07). Monitoring wells were installed at MW-33-07, MW-34-07, MW-37-07, MW-40-07, and MW-43-07 based on the presence of groundwater during soil boring advancement; however, insufficient groundwater was present in the wells MW-33-07 and MW-43-07 at the time of sampling to obtain groundwater samples.

SVOCs were detected above water solubility in groundwater at MW37-07 located east of former Plant 3.

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

During the 2012 Phase III ESA, monitoring well MW37-07 was re-sampled to investigate SVOC impacts.

Soil investigation: Soil samples were not collected as part of the Phase III ESA or Supplemental Phase III ESA. The historical soil boring locations are presented on Figure 12.

Groundwater Investigation: Monitoring well MW37-07 was re-sampled to investigate SVOC impacts. One groundwater sample from MW37-07 was collected for analysis of

SVOCs. The location of the well is presented on Figure 13. A sample key for the groundwater sample collected is presented in Table 2.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 5 are summarized in Table 7. According to Table 7, no contaminants exceeding applicable Part 201 criteria were detected in soil at AOI 5. Figure 12 presents the results compared against applicable Part 201 criteria.

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 5 are summarized in Table 8. According to Table 8, groundwater analytical results show that Benzo(g,h,i)perylene, and Indeno(1,2,3-cd)pyrene were detected at MW37-07 at concentrations exceeding Water Solubility. The sample was collected and analyzed in 2008. During the Phase III ESA, the well was re-sampled and analytical results were below applicable MDEQ Cleanup Criteria. Figure 13 presents the exceedances of applicable Part 201 criteria for groundwater for AOI 5.

4.5 AOI 12 - BARE SOIL AREA

BACKGROUND

Based on the review of the aerial photographs and previous Phase I Site inspections, vegetation in the area north/northwest of Building 30 is sparse. Site personnel interviewed during the 2006 and 2009 Phase I ESAs indicated that this area was historically part of a thermal soil remediation effort. No additional information regarding the remediation was available to CRA.

During the 2009 Phase II ESA, soil boring MW13-07 was advanced to investigate potential impacts associated with the bare soil area. A monitoring well was installed at MW13-07. Four test pits (TP-1 through TP-4) were excavated in the bare soil area to investigate potential impacts associated with past thermal soil destruction operations (1995) and the general area where a UST tank farm was historically located. Four soil samples were collected from test pit TP-1 (two floor samples, two wall samples), and two samples were collected from each of test pits TP-2 through TP-4 (one floor sample and one wall sample from each). Brick, asphalt, and concrete debris were observed in excavated material from each test pit.

SVOCs were detected above DCC, PSIC and VSIC in soil at TP-1 located north of Building 30 at a depth of 10 feet bgs. Specifically, soil analytical results show that Anthracene, Benzo(a) anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene and Pyrene were detected at TP-1 at concentrations exceeding GCPC and/or DCC and/or VSIC

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

Soil investigation: During the 2012 Phase III ESA, soil impacts at TP-1 were investigated by installing five soil borings (BH98-12, BH99-12, BH100-12, BH101-12 and BH107-12). The soil borings were placed to the north (BH98-12), east (BH99-12), south (BH100-12) and west (BH101-12). In addition, boring BH107-12 was installed within 2 feet of TP-1 to delineate vertical extent of historic impacts. Fifteen soil samples (which include one duplicate) were collected from the five soil borings for analysis of SVOCs. SVOCs were detected below applicable Part 201 criteria but above Residential DCC at BH101-12 and BH107-12.

During the 2012 Supplemental Phase III ESA, additional soil samples were collected to delineate the extent of impact at BH101-12 and BH107-12. Soil samples from the Phase III ESA delineated BH107-12 to the north, south, east and west. To investigate and delineate impacts at BH101-12, a geoprobe was utilized to collect soil samples from boring locations to the north (BH111-12), south (BH109-12) and west (BH110-12) of BH101-12. Delineation to the east was already completed during the Phase III ESA. Three step-out soil borings were installed farther to the north (BH114-12), south (BH116-12) and west (BH115-12). Two soil samples were collected from each soil boring (0-2 feet bgs and 3-4 feet bgs). Soil borings BH109-12, BH110-12, BH111-12 were analyzed for SVOCs. Soil borings BH114-12, BH115-12 and BH116-12 were placed on hold pending analysis of the first set of samples. Based on the analysis, BH115-12 was removed from hold and analyzed for SVOCs.

A sample key for the soil samples collected is presented in Table 2. The locations are presented on Figure 14. The soil boring logs are presented in Appendix B.

Groundwater investigation: Groundwater was not encountered in AOI 12. Therefore no investigation was conducted.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 12 are summarized in Table 9. According to Table 9, soil was delineated to the

north, east, south and west of historic impacts at TP-1. In addition, soil was vertically delineated at TP-1. Soil impacted below applicable Part 201 criteria was also delineated to the north, south east and west.

Figure 14 presents the exceedances of applicable Part 201 criteria for soil at AOI 12

Groundwater Sample Analytical Results: No groundwater was encountered.

4.6 AOI 20 - FORMER TRANSFORMER SUBSTATIONS AND LARGE CAPACITORS AND AOI 22 - PAINT MIX ROOMS

BACKGROUND

AOI 20 and AOI 22 were investigated together because they are located in the same area. A brief background of both AOIs is presented below.

AOI 20 – Former Transformer Substations and Large Capacitors

Numerous transformers and/or substations were historically located throughout the Site and were operated since at least 1909 in some instances. No information was available regarding the historical types of dielectric fluids utilized in the majority of the former transformers at the Site. Historical documentation for the Site indicates that transformers and large capacitors containing Askarel may have been present at the Site. There was evidence of PCBs from a rooftop transformer on Plant 4 in 1978. Former transformers, substations, and large capacitors were not specifically investigated during this Phase II ESA as the exact location of these items could not easily be targeted. The results from the overall 2009 Phase II ESA investigation contributed to the evaluation of historical transformers and/or substations. PCBs were analyzed in all soil samples collected from the Site during the 2009 Phase II ESA. PCBs were detected in the soil sample collected from BH-72-08 (AOI 22) at a concentration exceeding the Residential and Nonresidential DCC and in a groundwater sample collected at MW-2-07 (AOI 1) at a concentration exceeding the GSIC and Residential and Nonresidential DWC.

AOI 22 – Paint Mix Rooms

Based on observations during the 2006 Phase I ESA, a paint mix room was located in the former Plant 3. Historically, paint mixing was conducted in the basement of former Plant 3. Additional information regarding historical paint mixing areas was not available.

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

During the 2009 Phase II ESA, soil borings BH72-08 and BH-73-08 were advanced to investigate potential impacts associated with the paint mix rooms. PCBs were detected above DCC in the soil at BH72-08 located in the southern portion of former Plant 3. Sudan IV field test indicated the potential for NAPL. Impacts were detected at a depth of 12-14 feet bgs.

Soil investigation:

During the 2012 Phase III ESA, soil impacts at BH72-08 were investigated by installing five soil borings (BH102-12, BH103-12, BH104-12, BH105-12 and BH106-12) to the north, south, east, and west and near BH72-08. Boring BH106-12 was collected within 2 feet of BH72-08 and two samples were collected from 15-17 and 18-12 feet bgs for vertical delineation. In total, fifteen soil samples (which include one duplicate) were collected from the five soil borings for analysis of PCBs. In addition, three soil samples were collected from BH102-12, BH103-12, BH104-12 and BH105-12 from 12-14 feet bgs for additional analysis of VOCs and SVOCs. The additional analysis was completed because field evidence of potential impacts were encountered in the vadose zone from 12-14 feet bgs in soil borings BH104, BH105-12 and BH106-12. A sample was not collected from BH106-12 for analysis of VOC or SVOCs at 12-14 feet bgs because historical data from BH72-08 was already available. The locations are presented on Figure 15. The soil boring logs are presented in Appendix B.

Groundwater investigation: Investigation of groundwater included the installation of one down-gradient monitoring well (MW88-12). The monitoring well was placed in the same vicinity as BH102-12 due to the presence of groundwater. Groundwater was encountered at other borings; however, none displayed enough potential for sampling. A groundwater sample was collected from MW88-12 for analysis of metals, VOCs, SVOCs and PCBs. Metals and SVOCs were detected in groundwater above Residential and Non-Residential DWL and GSI.

During the 2012 Supplemental Phase III ESA, additional delineation of groundwater near the former Paint Mix Rooms was completed. One groundwater monitoring well was installed south (MW89-12) and one groundwater monitoring well was installed east (MW90-12) of the former Paint Mix Rooms. SVOCs were analyzed from the groundwater sample collected from MW89-12. SVOCs and VOCs were analyzed from the groundwater sample collected from MW90-12. The additional VOC analysis was completed to delineate VOCs to the south of MW74-08 as discussed in the AOI 28 – LNAPL Plume section. The locations are presented on Figure 16. The well construction details are presented in Appendix B.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 20 and 22 are summarized in Table 10. According to Table 10, PCBs were detected in BH72-08 at concentrations exceeding DCC. Soil samples collected from the north (BH102-12), east (BH103-12), south (BH104-12) and west (BH105-12) were below all Part 201 criteria for PCBs. Therefore, PCB impacts at BH72-08 are delineated. Figure 15 presents the results compared against applicable Part 201 criteria.

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 20 and 22 are summarized in Table 11. According to Table 11, no contaminants exceeding applicable Part 201 criteria were detected in groundwater in AOI 20 and 22. Additionally, no PCBs were detected above all Part 201 criteria for the groundwater collected at MW88-12. Figure 16 presents the results compared against applicable Part 201 criteria.

4.7 AOI 26 - RELEASES TO SEWERS

BACKGROUND

Based on the review of available documentation, numerous releases of process wastewater to the storm sewer system have occurred. In addition, there was evidence of industrial waste entering the sanitary sewers when industrial waste backed up in the plant due to valves at the wastewater lift station were closed for a release that occurred in November 1987. Released materials included acids, solvents, and petroleum products. Potential impacts to Site soil and/or groundwater could not be confirmed.

During a conference call on September 28, 2011, the EPA requested additional investigation of storm sewers as potential conduits for off-Site migration and potential Site exit points.

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

Soil Investigation: The soil was not investigated as part of the Phase III ESA or Supplemental Phase III ESA.

Groundwater Investigation: During the 2012 Phase III ESA, storm sewer depths were measured and two monitoring wells (MW82-12 and MW83-12) were installed in or immediately adjacent to the bedding of the utility corridor. The two monitoring wells

were installed along the western boundary of the Site and represent potential Site exit points. Groundwater samples were collected for analysis of PCBs, SVOCs and VOCs. The locations are presented on Figure 17. The well construction details are presented in Appendix B.

ANALYTICAL RESULTS

Soil Sample Analytical Results: No soil samples were collected or analyzed as part of the Phase III ESA or Supplemental Phase III ESA.

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 26 are summarized in Table 12. According to Table 12, no contaminants exceeding applicable Part 201 criteria were detected in groundwater in AOI 26. Figure 17 presents the results compared against applicable Part 201 criteria.

4.8 AOI 28 - LNAPL PLUME

BACKGROUND

During the 2009 Phase II ESA, CRA encountered a LNAPL plume on the south parcel of the Site, and an LIF survey was conducted to delineate the vertical and horizontal extent of the plume. From April 2008 through March 2012 quarterly LNAPL recovery was conducted at MW69-08. The recovery events removed a total of 8.59 gallons of LNAPL.

PHASE III ESA AND SUPPLEMENTAL PHASE III ESA

Soil and LNAPL Investigation: During the 2012 Phase III ESA, LNAPL was evaluated to select the appropriate remedy for AOI 28. In addition, the EPA requested additional groundwater delineation of potential impacts from dissolved constituents related to the LNAPL plume. To address these requests, two 4-inch recovery/monitoring wells (MW84-12 and MW86-12) were installed within the LNAPL plume and soil cores were collected from each. Core photography was completed on the soil cores and soil samples were selected for the following analysis:

- Grain size analysis (ASTM D422/D4464M)
- Soil bulk density, grain density, total and air-filled porosity, hydraulic conductivity measurements (various)
- Initial pore fluid (water and LNAPL) saturations (American Petroleum Institute [API] RP40)

- Initial and final LNAPL saturations using a water drive method (Proprietary/ API RP40)
- Residual water saturation and van Genuchten parameters (ASTM D6836)

The results of the soil core analysis and the appropriate remedy for LNAPL recovery is discussed in Appendix E - LNAPL Memorandum.

The EPA requested samples of LNAPL for analysis; however, no samples were collected due to minimal LNAPL (<.01 feet) encountered in monitoring wells MW69-08, MW84-12 and MW86-12.

Soil samples were collected during installation of MW85-12 and MW87-12 to investigate potential soil impacts associated with the LNAPL. Five soil samples (including one duplicate) were collected from the two locations for analysis of VOCs, SVOC, PCBs, and metals.

During the 2012 Supplemental Phase III ESA, two soil borings (BH112-12 and BH113-12) were completed to a maximum of 20 and 25 feet bgs, respectively. The soil borings were installed to collect LNAPL saturated soil samples. Upon identification of an LNAPL saturated interval, soil from that interval was collected and analyzed for TCL VOCs, SVOCs, PCBs and metals. The locations are presented on Figure 18. The soil boring logs are presented in Appendix B.

Groundwater Investigation: One monitoring well (MW85-12) was installed down-gradient and one monitoring well (MW87-12) was installed west of the LNAPL plume. Groundwater samples collected from the two monitoring wells were analyzed for VOCs, SVOC, PCBs, and metals.

As requested by the EPA, four existing monitoring wells (MW63-08, MW64-08, MW68-08 and MW74-08) were re-sampled to further delineate potential dissolved LNAPL constituents in the groundwater. Groundwater samples collected from the four monitoring wells were analyzed for VOCs, SVOC, PCBs, and metals. The locations are presented on Figure 19. The well construction logs are presented in Appendix B.

ANALYTICAL RESULTS

Soil Sample Analytical Results: The analytical results for all soil samples associated with AOI 28 are summarized in Table 13, except the soil core photography which is discussed in Appendix E. According to Table 13, no contaminants exceeding applicable Part 201

criteria were detected in soil at AOI 28. Figure 18 presents the exceedances of applicable Part 201 criteria for soil at AOI 28

Groundwater Sample Analytical Results: The analytical results for all groundwater samples associated with AOI 28 are summarized in Table 14. According to Table 14, and as discussed in Section 4.3, groundwater analytical results show that Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene and Indeno(1,2,3-cd)pyrene were detected at MW74-08 at concentrations exceeding GCC and/or Water Solubility in a sample collected and analyzed in 2008. During the Phase III ESA, the well was re-sampled and analytical results were below applicable MDEQ Cleanup Criteria. In addition, results were below applicable Part 201 criteria from groundwater collected at MW84-21, MW85-12, MW87-12, MW63-08, MW64-08, MW68-08 and MW74-08. Figure 19 presents the exceedances of applicable Part 201 criteria for groundwater at AOI 28.

LNAPL Results: A discussion of the results of the Phase III ESA investigation of the LNAPL is discussed in the LNAPL Memorandum provided in Appendix D. The LNAPL Memorandum provides the following discussion pertaining to the LNAPL impacts:

- A summary of CRA's understanding of the LNAPL Conceptual Site Model (LCSM)
- An evaluation of potential remedial drivers in a manner consistent with Interstate Technology & Regulatory Council (ITRC) LNAPL guidance and a draft RACER LNAPL remedial decision-making process developed in conjunction with the Michigan Department of Environmental Quality
- Propose a technically appropriate LNAPL management strategy based on Items 1 and 2 above.

The results of the soil core petrophysical testing are discussed as part of the LCSM discussion in Appendix D.

5.0 CURRENT HUMAN EXPOSURES UNDER CONTROL

5.1 INFORMATION REVIEWED

All relevant information has been considered in preparing this report (Section 2.0). Specifically, information from the following sources was reviewed to support the evaluation of whether current human exposures at the Site are under control:

- Various Phase I Environmental Site Assessment Reports
- Quantitative Risk Assessment Results (ENVIRON, 2008)
- Phase II Environmental Site Assessment Report (CRA, 2009)
- Draft Current Conditions Report (CRA, 2011)
- Supplemental Current Conditions Report (CRA, 2012a)
- Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan (CRA, 2012b)
- August 2012 Phase III ESA and December 2012 Supplemental Phase III ESA results

The reports and work plans listed above have been provided to the USEPA.

5.2 PRESENCE OF CONTAMINATION

"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors or solids that are subject to RCRA) in concentrations in excess of appropriate protective risk-based "levels" (for the media that identify risks within the acceptable risk range).

In this report, the presence of "contamination" is identified based on comparison of the applicable MDEQ Part 201 generic cleanup criteria. The applicable MDEQ Part 201 Cleanup Criteria are described in Section 4.1 and reviewed by the USEPA through the completion of the draft CCR and Supplemental CCR.

5.2.1 SOIL

The Section 4.0 tables and figures summarize the soil characterization data for each AOI. As discussed in Section 4.0, the screening criteria for on-Site soil include the applicable MDEQ Part 201 generic cleanup criteria. They also include conservative Site-specific criteria that were developed for evaluating inorganics in soil. The methodology for development of the criteria is presented in the draft Background Soil Investigation

Memorandum located in Appendix D of this report. The ENVIRON Quantitative Risk Assessment was taken into account for soils, specifically for soils collected during the Phase II ESA; however, the main determination was comparison against applicable Part 201 criteria.

Soil that meets the definition of "contamination" at an area is identified on the tables from Section 4.0 by comparing the highest site-related concentration of each constituent in soil at the area to the screening criteria. For metals, site-related concentrations are conservatively considered to be those higher than the Site-Specific Cleanup Criteria. For other constituents, all concentrations are conservatively assumed to be site-related.

In AOI 1, AOI 12, and AOI 20 one or more constituents have concentrations that are higher than the applicable Part 201 Criteria. In AOI 1, the constituent is benzene. Although benzene does not exceed applicable Part 201 criteria, the location was off-site and therefore subject to all MDEQ Part 201 criteria due to the lack of future site restrictions. In AOI 12, these constituents are Anthracene, Benzo(a) anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene and Pyrene, and in AOI 20, these constituents are PCBs.

In addition to the soil data summarized in the Section 4.0 tables and figures, chemical characterization data for LNAPL were collected during the investigations. The LNAPL characterization data are summarized in Appendix E.

No other AOI has constituents with concentrations that are higher than the applicable Part 201 criteria. The locations and depth intervals at which concentrations in soil are considered to meet the definition of "contamination" are summarized on tables and shown on the databox figures in Section 4.0.

The potential for current human exposure to the constituents in soil with concentrations higher than the screening criteria and constituents in the LNAPL is discussed in Section 5.3 and the significance of any potential exposure is discussed in Section 5.4.

5.2.2 GROUNDWATER

The Section 4.0 tables summarize the groundwater characterization data for each AOI. As discussed in Section 4.0, the screening criteria for on-Site groundwater include the applicable MDEQ Part 201 generic cleanup criteria. For groundwater collected off-Site the applicable criteria includes all MDEQ Part 201 generic cleanup criteria.

Groundwater that meets the definition of "contamination" at an area is identified on the tables from Section 4.0 by comparing the highest site-related concentration of each constituent in groundwater at the area to the screening criteria. All concentrations are conservatively assumed to be site-related.

In AOI 1, AOI 2, AOI 5, and AOI 28 one or more constituents have concentrations that are higher than the applicable Part 201 Criteria. In AOI 1, the constituents are TCE, aluminum, iron, manganese, selenium and silver. Although the constituents do not exceed applicable Part 201 criteria, the location was off-site and therefore compared to all MDEQ Part 201 criteria due to the lack of future site restrictions. In AOI 2 and AOI 28, these constituents are Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene and Indeno(1,2,3-cd)pyrene. These constituents were detected at MW74-08 which is also used to monitor AOI 2 and AOI 28, so the constituents are also part of both AOIs but located in one area. In AOI 5, these constituents are Benzo(g,h,i)perylene, and Indeno(1,2,3-cd)pyrene, in MW37-07. The SVOC exceedances at monitoring wells MW74-08 and MW37-07 reflect data collected in 2008. During the Phase III ESA, both monitoring wells were re-sampled and the analytical results indicated SVOCs were below applicable Part 201 criteria.

No other area has constituents with concentrations that are higher than the screening criteria. The locations at which concentrations in groundwater are considered to meet the definition of "contamination" are summarized on tables and shown on the databox plans in Section 4.0.

The potential for current human exposure to the constituents in groundwater with concentrations higher than the screening criteria is discussed in Section 5.3 and the significance of any potential exposure is discussed in Section 5.4.

5.3 EXPOSURE PATHWAYS

The potential for exposure to the media that meet the definition of "contamination" identified in Section 5.2 under current conditions at the Site is discussed in Table 15 – Scenarios for Potential Human Exposure and summarized below:

Soil and LNAPL

Currently, no operations are conducted at the site, and the former manufacturing buildings have been demolished so that only foundation slabs remain. Current workers at the Site are limited to those supporting environmental investigations. Current and future workers need to follow a Site-specific health and safety plan to avoid the potential

for significant exposures during all activities on-Site, including subsurface activities. Therefore, the only potential for current on-Site exposure to contaminated soil is exposure of trespassers to surface soil in unpaved areas, although the Site is fenced to control. AOI 12 is unpaved with soil exceedances of direct contact collected from test pit TP-1 at a depth of 10 feet bgs. During the Phase III ESA and Supplemental Phase III ESA, soil samples were collected from the surface soil at TP-1 and to the north, south, east and west with results all below applicable Part 201 Criteria. Therefore there is no potential for direct contact with contaminated soils on-Site.

Potential exposure of workers during off-Site construction activities along the ROW or adjacent ROW north of the site are a potential exposure pathway. The impacts are limited to a Benzene exceedance of DWC. Since it did not exceed DCC, there is no potential for direct contact with contaminated soils off-Site.

Based on the results of ENVIRON Quantitative Risk Assessment results summarized in Table 3b, Table 4, and Table 5 of Appendix F, the constituent concentrations above do not indicate a potential for significant worker exposures at the Site

Groundwater

The Site and the surrounding area obtain potable water from the municipal drinking water system and do not use local groundwater as drinking water or industrial water supply. Therefore, current exposure to potable groundwater use is not a complete pathway. Potential exposure via non-potable groundwater use at off-site areas down-gradient of the Site is possible. Potential exposure of workers during off-Site construction activities that extend into the water table at areas with contaminated groundwater is also possible.

There is no other complete exposure pathway between media that meet the definition of "contamination" and human receptors at the Site that can be reasonably expected under current conditions. The potential significance of exposure pathways via these complete pathways are discussed in Section 5.4.

5.4 SIGNIFICANCE OF POTENTIAL EXPOSURES

The significance of potential exposures identified in Section 5.3 is discussed below.

5.4.1 SOIL

The significance of potential exposure to soil that meets the definition of "contamination" under current conditions at the Site is evaluated by comparing soil analytical results against applicable Part 201 generic cleanup criteria. If a soil exceedance is greater than the criteria, the surrounding soils were investigated to delineate the extent of potential for significant exposure.

At AOI 1, AOI 12, AOI 20 soil was encountered with constituents detected above applicable Part 201 criteria. Based on the Phase III and Supplemental Phase III ESA no significant exposures in soil exist on-Site. The soil impacts at AOI 12 were delineated by samples to the north (BH98-12), east (BH99-12), south (BH100-12) and west (BH115-12). In addition, boring BH107-12 was installed within 2 feet of TP-1 to delineate vertical extent impacts. The soil impacts at AOI 20 were delineated to the north (BH102-12), east (BH103-12), south (BH104-12) and west (BH105-12). Based on the delineation of impacts, it is unlikely soil located on-Site pose a potential for significant exposure. In addition, ENVIRON Quantitative Risk Assessment results summarized in Appendix F, indicate the concentrations of impacts at AOI 12 and AOI 20 (from the Phase II ESA Results) do not indicate a potential for significant worker exposure.

AOI 1 had impacts in soil along the ROW to the north of the Site. The impacted soil was detected below the applicable Part 201 criteria, however the area is not subject to future land use restrictions so the soil was compared to all MDEQ criteria. Impacts were detected above DWPC; however, a corresponding groundwater sample from the same location did not exceed DWC. Since the Site and the surrounding area obtain potable water from the municipal drinking water system and do not use local groundwater as drinking water or industrial water supply it is unlikely to pose a potential for significant exposure.

5.4.2 GROUNDWATER

Potential exposure to groundwater that meets the definition of "contamination" under current conditions is limited to the off-site area down-gradient of AOI 1. The significance of potential exposure of workers and residents in these areas are discussed below.

Residents

Potential exposure of residents to site-related constituent to groundwater is limited to outdoor recreation since groundwater is not currently or reasonable expected for future potable water supply. Therefore, since the impacted groundwater only exceeded DWC

and GSI, the Site generated groundwater migrating off Site does not pose significant exposure to residents.

Construction Workers

Workers performing construction that extends into the groundwater could be exposed to constituents in shallow groundwater in areas where the groundwater is within typical excavations depths. Potential routes of exposure would include dermal, contact and inhalation of vapor. Therefore, since the impacted groundwater only exceeded DWC and GSI, the site generated groundwater migrating off-site does not pose significant exposure to construction workers.

6.0 CONCLUSIONS

The presence of "contamination" at the Site is identified based on a comparison of the site investigations and characterization data for soil and groundwater with applicable Part 201 criteria. Soil and groundwater at certain AOIs are considered to meet the definition of "contamination" when the highest concentration of each constituent at the AOI exceeds the screening criteria. Also, LNAPL at the water table was found during the investigations at AOI 28.

Current exposure to on-site contaminated soil, LANPL and contaminated groundwater at these areas are limited to potential exposure of trespassers to surface soil because the Site is currently inactive. The only on-Site personnel are workers who conduct environmental investigations, and they follow a Site-specific health and safety plan to avoid significant exposures during all on-Site activities.

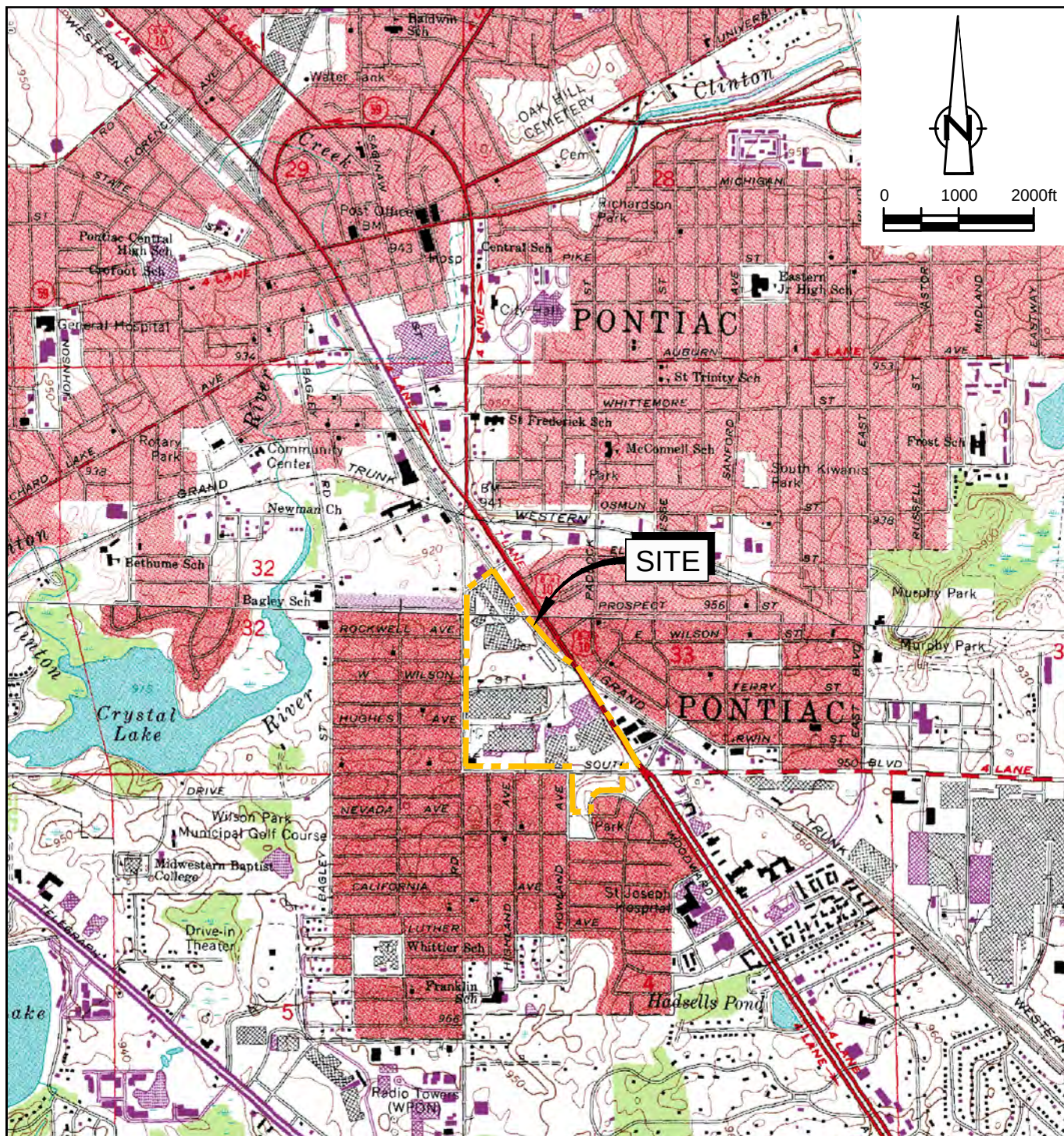
Current exposure to off-Site contaminated groundwater via potable use is not possible because potable water in the area is provided by a municipal source. However, potential exposure to contaminated off-Site groundwater is possible if construction workers excavate in the water table. Potential exposure to contaminated off-site groundwater is also possible if residents in the area have non-potable groundwater uses.

When the magnitude of potential exposure is considered, the concentrations of constituents in the on-Site and off-Site soil, LNAPL and on-site and off-site groundwater do not present a significant exposure. The significance of potential exposure is evaluated by comparing the impacts against applicable Part 201 criteria and the delineation activities completed during the Phase II ESA, Phase III ESA and Supplemental Phase III ESA. The results of this assessment of risk show that the data collected at the Site support a determination that all current human exposures to "contamination" at or from the Site are under control.

7.0 REFERENCES

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- CRA, Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan, PCC-Validation, Pontiac, Michigan, 2012b

FIGURES



SOURCE: USGS QUADRANGLE MAPS;
PONTIAC NORTH AND SOUTH, MICHIGAN; 1968

LEGEND

— — — — — APPROXIMATE SITE BOUNDARY

figure 1

SITE LOCATION
PCC - VALIDATION
PONTIAC VALIDATION CENTER
200 South Boulevard West, Pontiac, Michigan



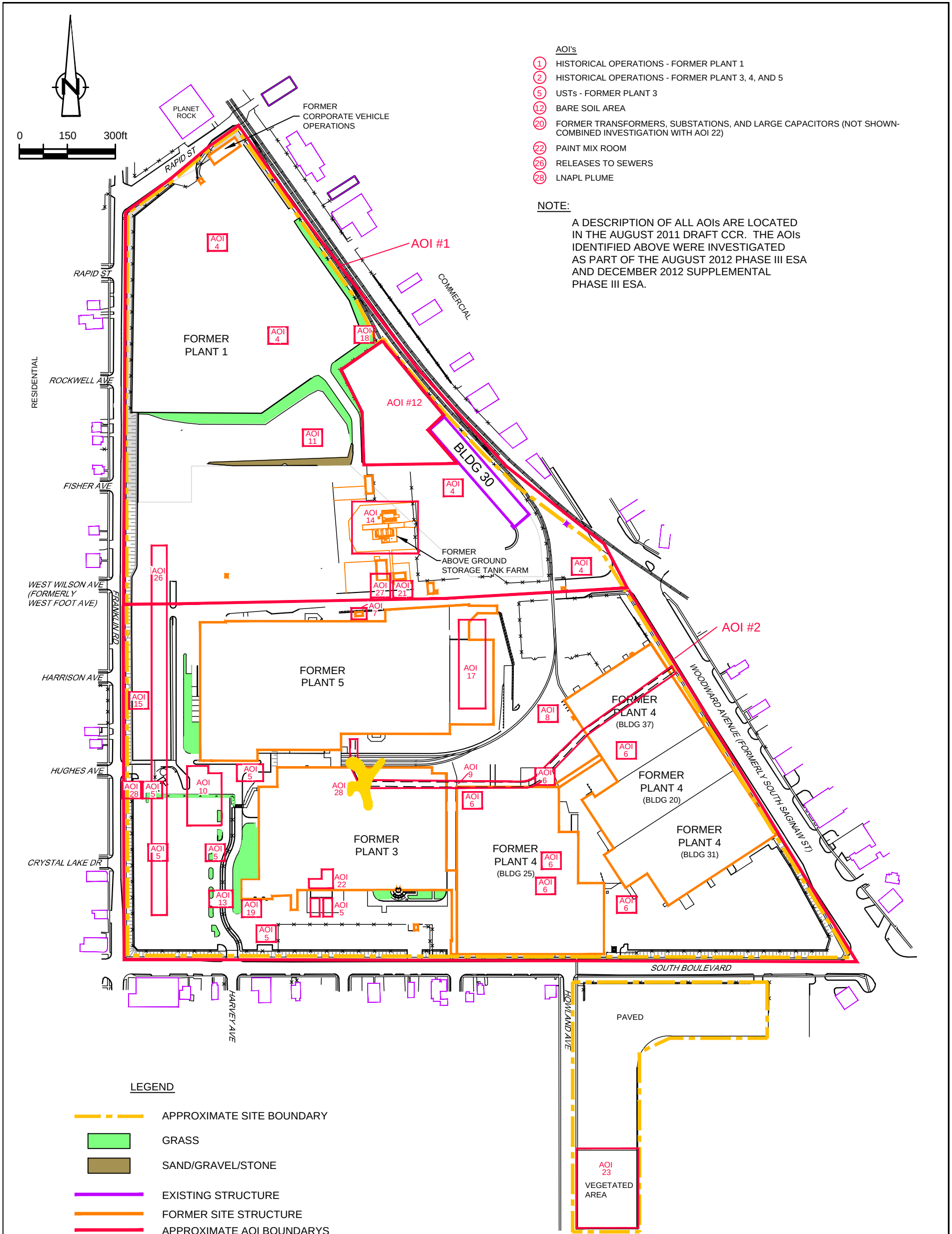


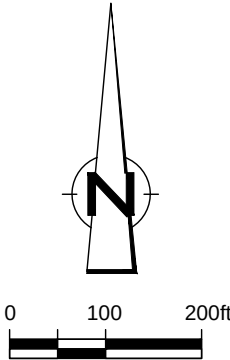
figure 2

SITE PLAN WITH AOI LOCATIONS
PCC - VALIDATION
200 South Boulevard West, Pontiac, Michigan





No	Revision	Date	Initial



LEGEND

- BH-98-12 COMPLETED SOIL BORING LOCATION BY CRA IN 2012
- MW98-12 COMPLETED MONITORING WELL LOCATION BY CRA IN 2012
- TP1-07 COMPLETED TEST PIT LOCATION
- MW28-07 COMPLETED MONITORING WELL LOCATION
- TMW71-08 COMPLETED TEMPORARY MONITORING WELL LOCATION
- BH8-07 COMPLETED SOIL BORING LOCATION
- MW2-07 MONITORING WELL LOCATION RE-SAMPLED BY CRA IN 2012
- BH111-12 COMPLETED SOIL BORING LOCATION - DECEMBER 2012
- MW90-12 COMPLETED MONITORING WELL LOCATION - DECEMBER 2012
- APPROXIMATE SITE BOUNDARY
- EXISTING STRUCTURE
- FORMER SITE STRUCTURE
- M.H. MANHOLE
- C.B. CATCH BASIN
- CROSS-SECTION LINE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

CROSS-SECTION LOCATION MAP

PCC-VALIDATION

PONTIAC, MICHIGAN



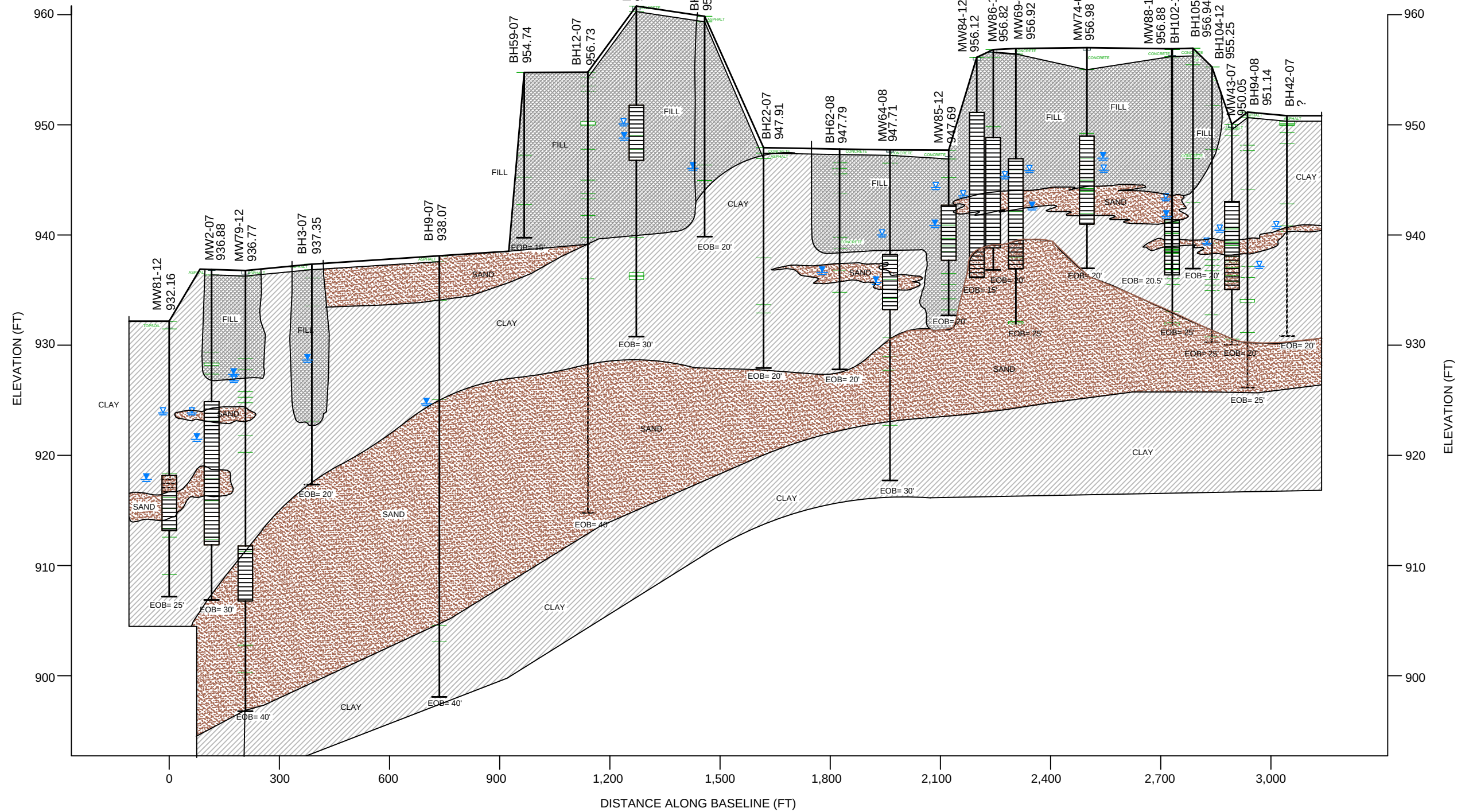
CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: T.K.	Reviewed By: M.C.	Date: JANUARY 2013
Scale: 1:200	Project N°: 017322-T01	Report N°: 017 Drawing N°: 3

A
NORTH

A'
SOUTH



- SAND
- CLAY
- FILL
- SILTY

GROUND
WELL
SCREEN
EOB = END OF BORING

▼ GROUNDWATER ELEVATION 10/2/12
▼ WET DURING BORING

SCALE:
HORIZONTAL 1" = 300
VERTICAL 1" = 10'

figure 4

CROSS-SECTION A-A'
PCC - VALIDATION
Pontiac, Michigan



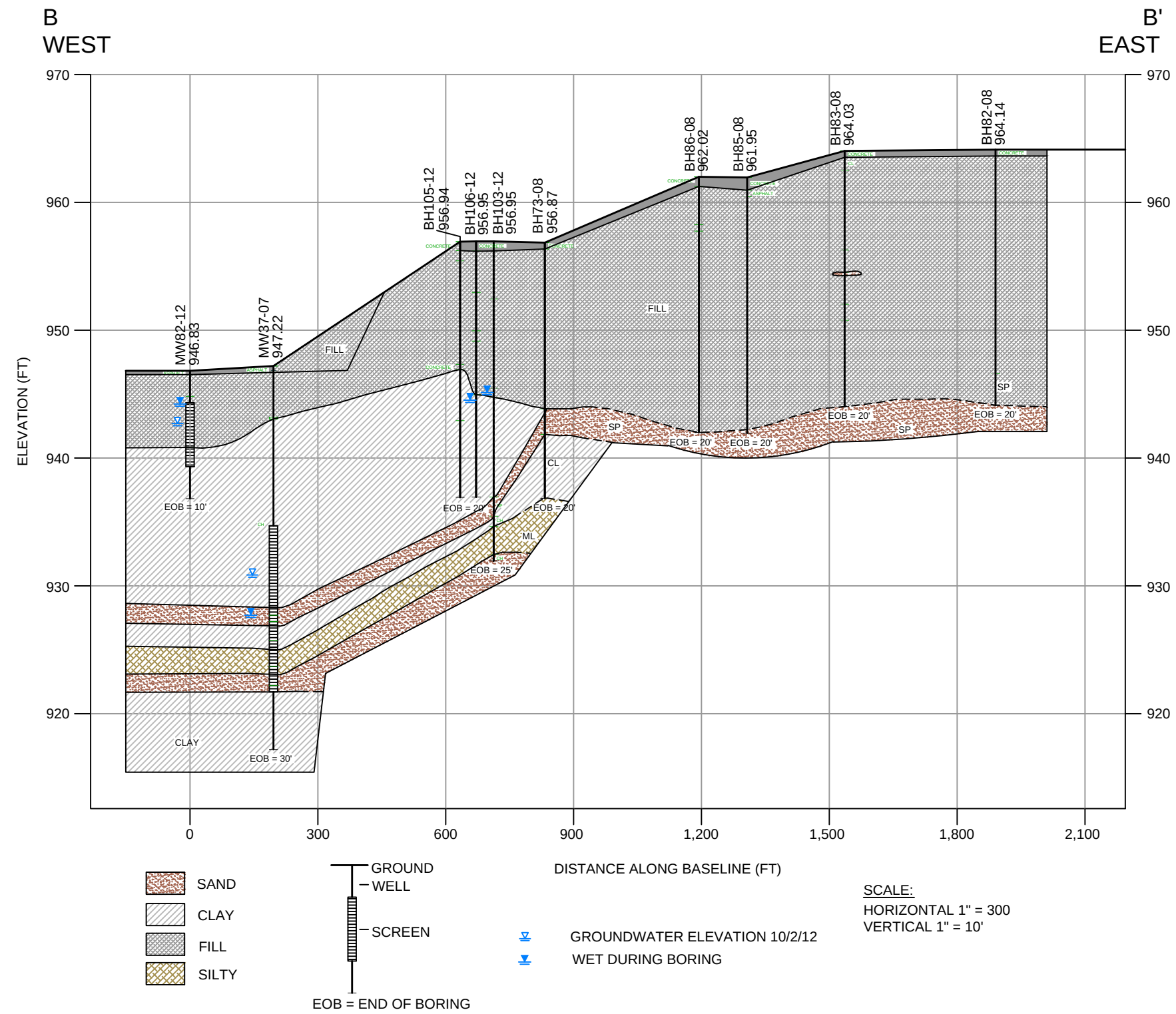


figure 5

CROSS-SECTION B-B'
 PPC - VALIDATION
Pontiac, Michigan



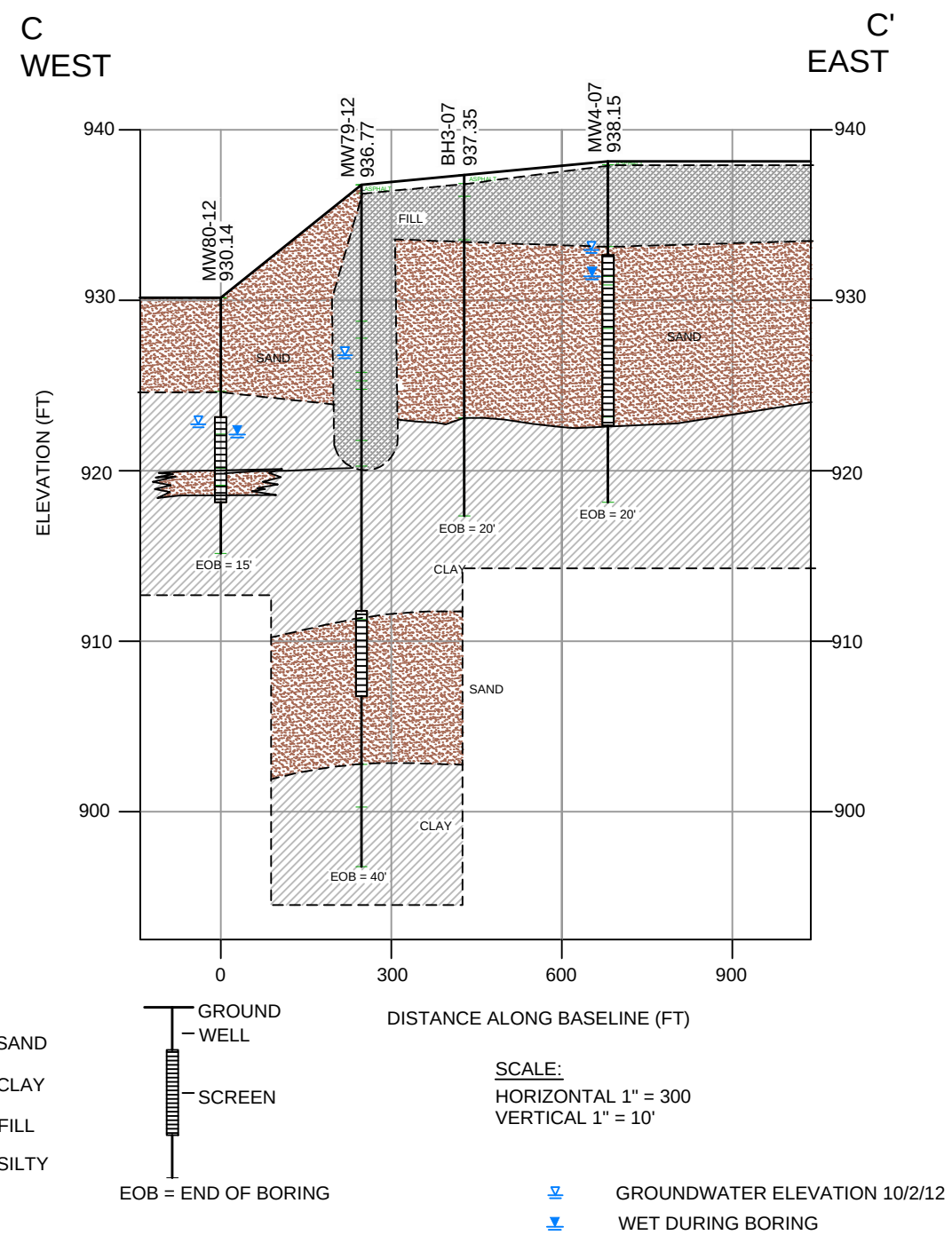


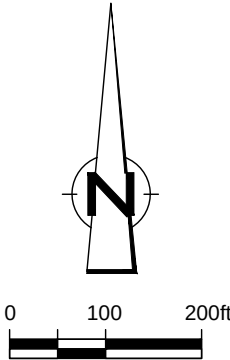
figure 6

CROSS-SECTION C-C'
 PCC - VALIDATION
 Pontiac, Michigan





No	Revision	Date	Initial



- LEGEND**
- BH-98-12 COMPLETED SOIL BORING LOCATION BY CRA IN 2012
 - MW88-12 COMPLETED MONITORING WELL LOCATION BY CRA IN 2012
 - TP1-07 COMPLETED TEST PIT LOCATION
 - MW28-07 COMPLETED MONITORING WELL LOCATION
 - TMW71-08 COMPLETED TEMPORARY MONITORING WELL LOCATION
 - BH8-07 COMPLETED SOIL BORING LOCATION
 - MW2-07 MONITORING WELL LOCATION RE-SAMPLED BY CRA IN 2012
 - BH111-12 COMPLETED SOIL BORING LOCATION - DECEMBER 2012
 - MW90-12 COMPLETED MONITORING WELL LOCATION - DECEMBER 2012
 - APPROXIMATE SITE BOUNDARY
 - EXISTING STRUCTURE
 - FORMER SITE STRUCTURE
 - M.H. MANHOLE
 - C.B. CATCH BASIN
 - 945 GROUNDWATER CONTOUR
 - NU ELEVATION NOT USED

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved	
DRAWING STATUS	
Status	Date Initial

GROUNDWATER CONTOUR
OCTOBER 2012

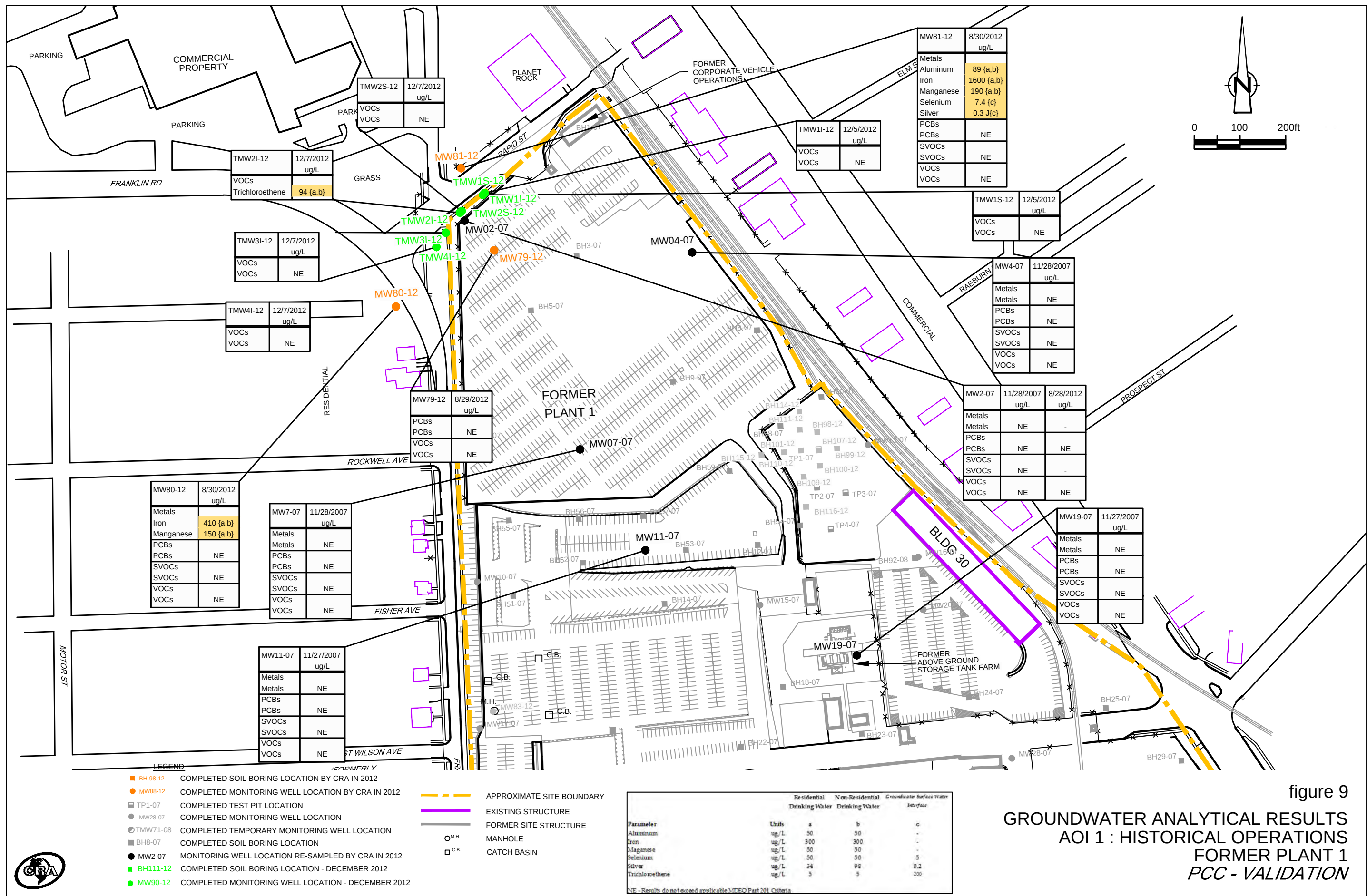
PCC-VALIDATION

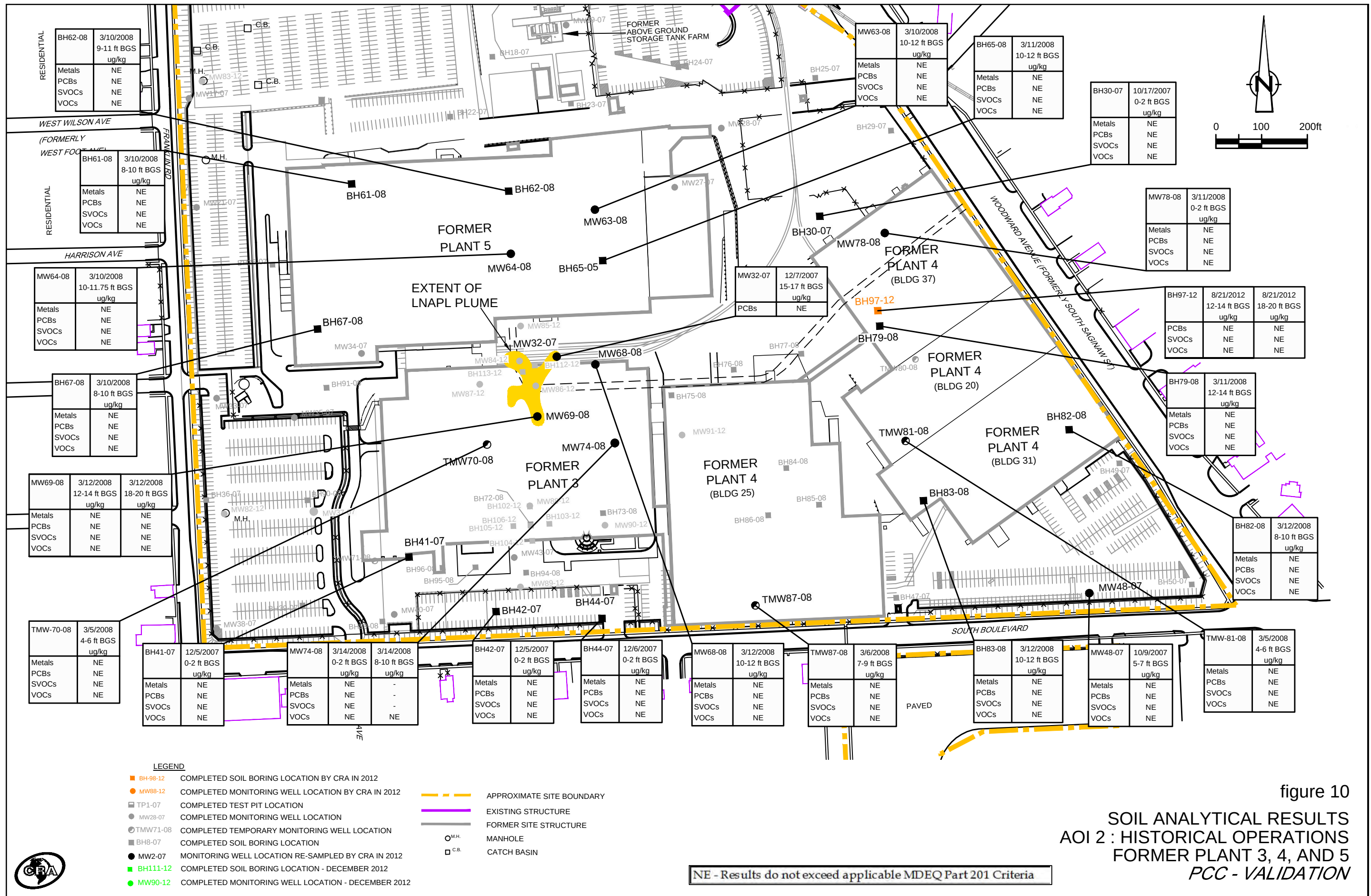
PONTIAC, MICHIGAN

**CONESTOGA-ROVERS & ASSOCIATES**

Source Reference:

Project Manager: T.K.	Reviewed By: M.C.	Date: JANUARY 2013
Scale: 1:200	Project N°: 017322-T01	Report N°: 017 Drawing N°: 7





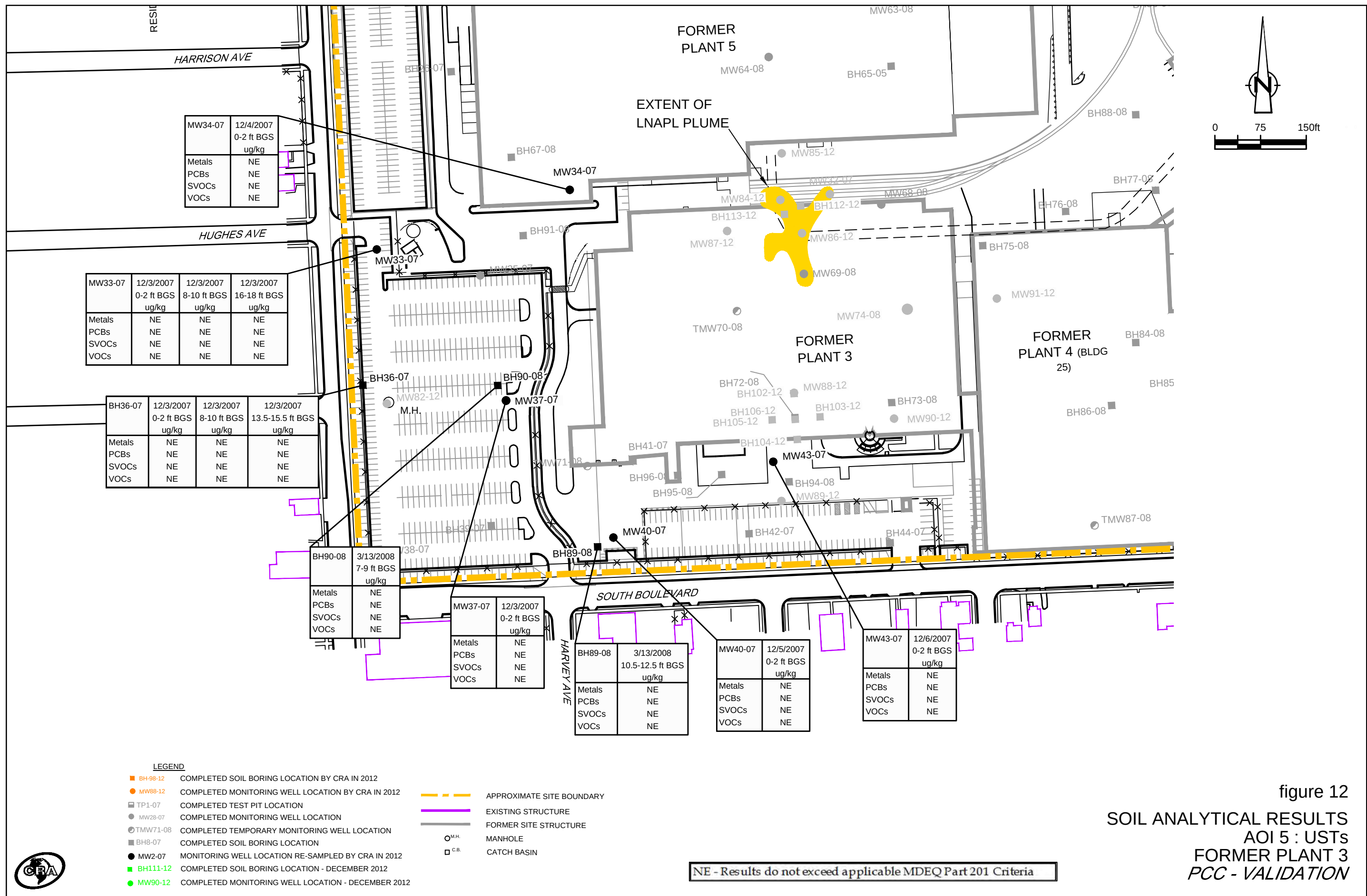
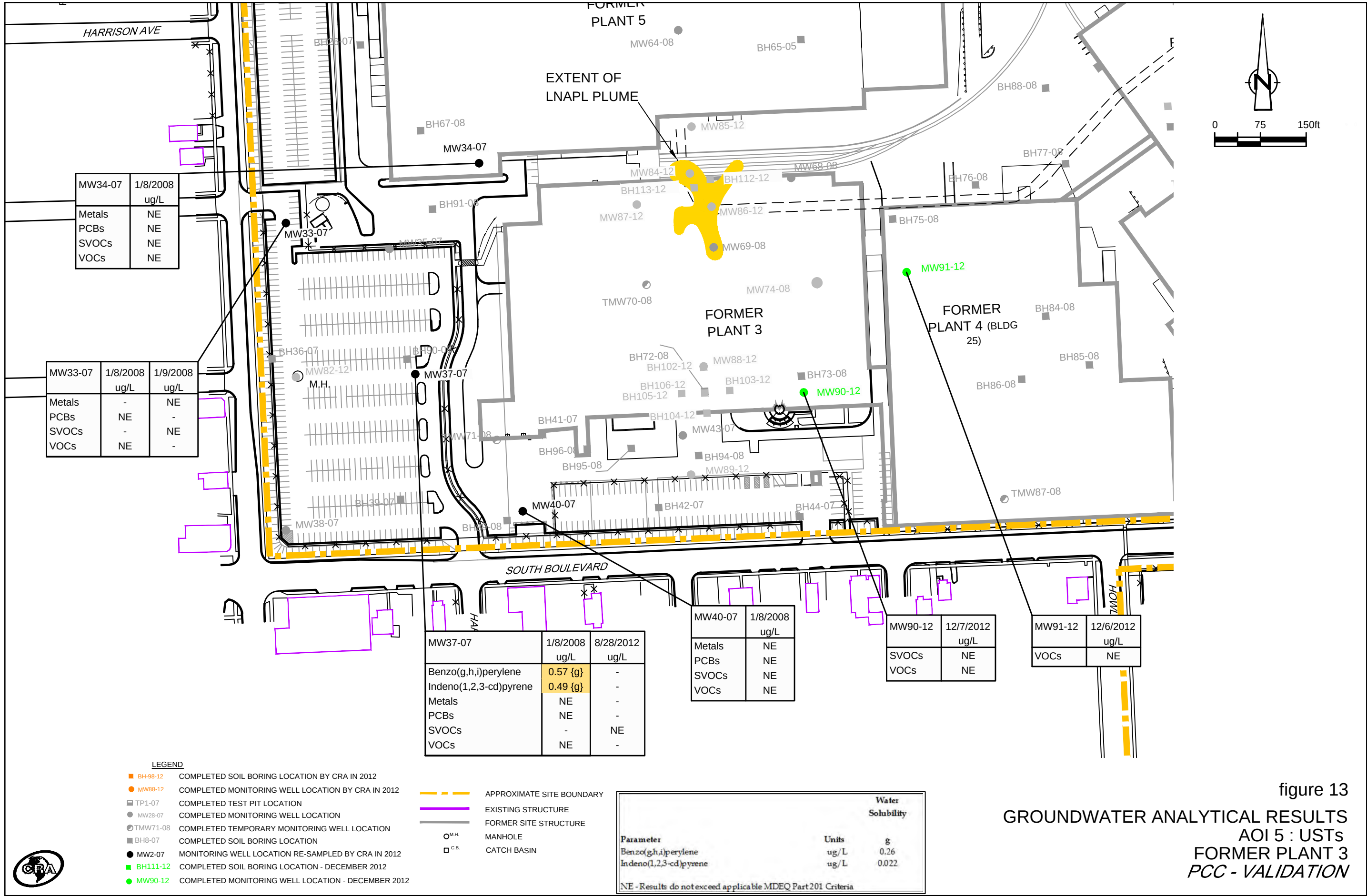
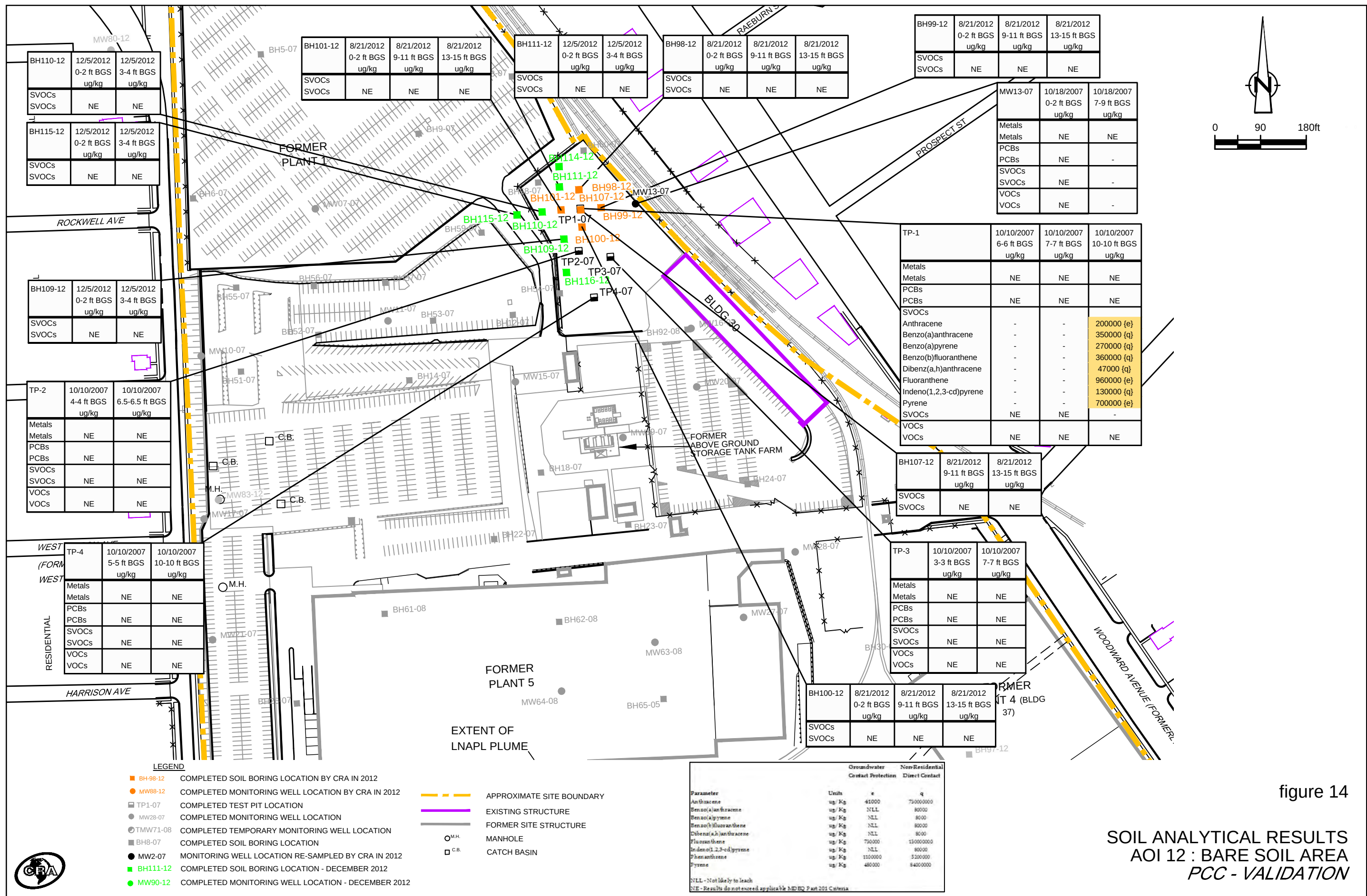
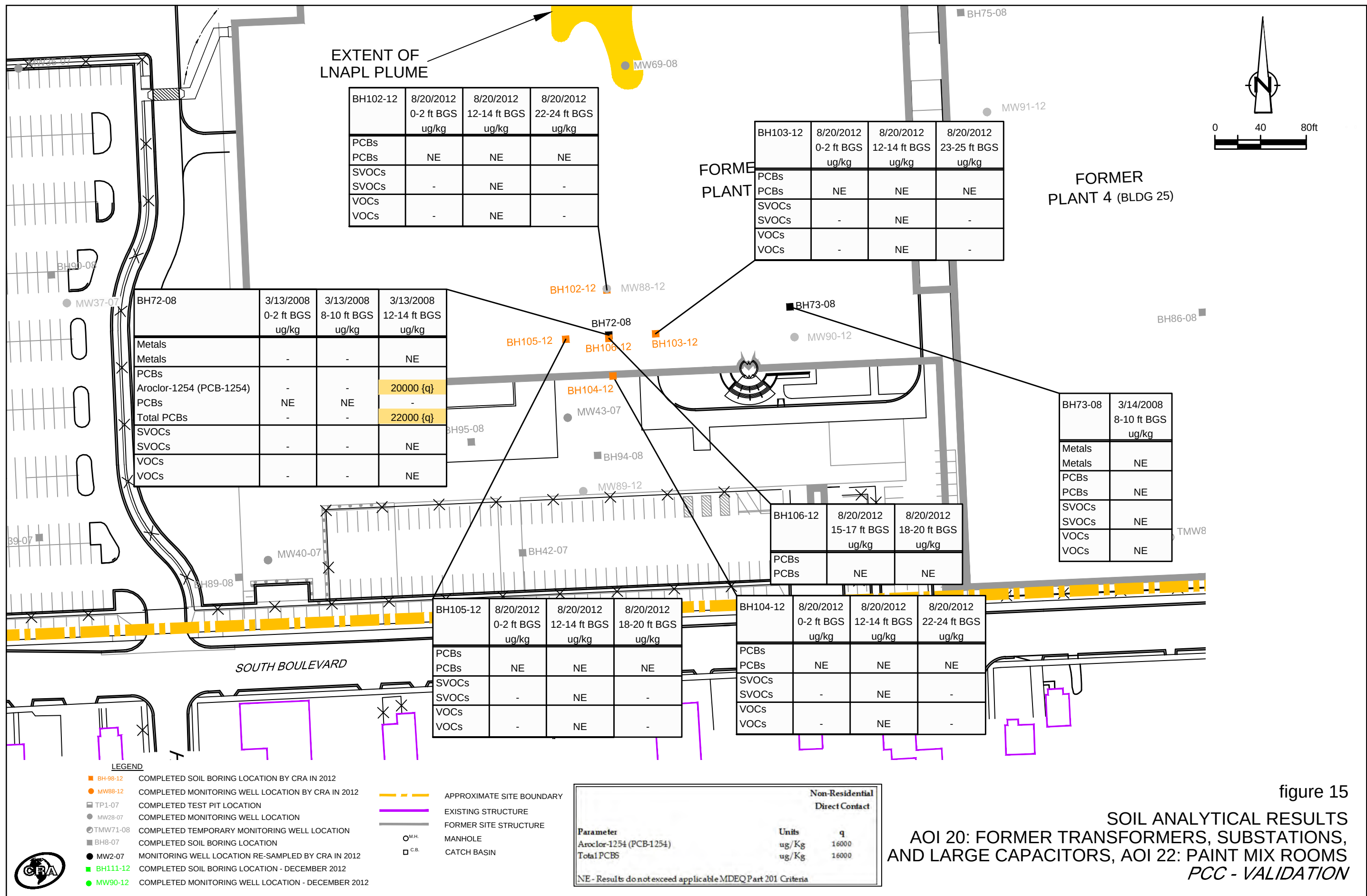


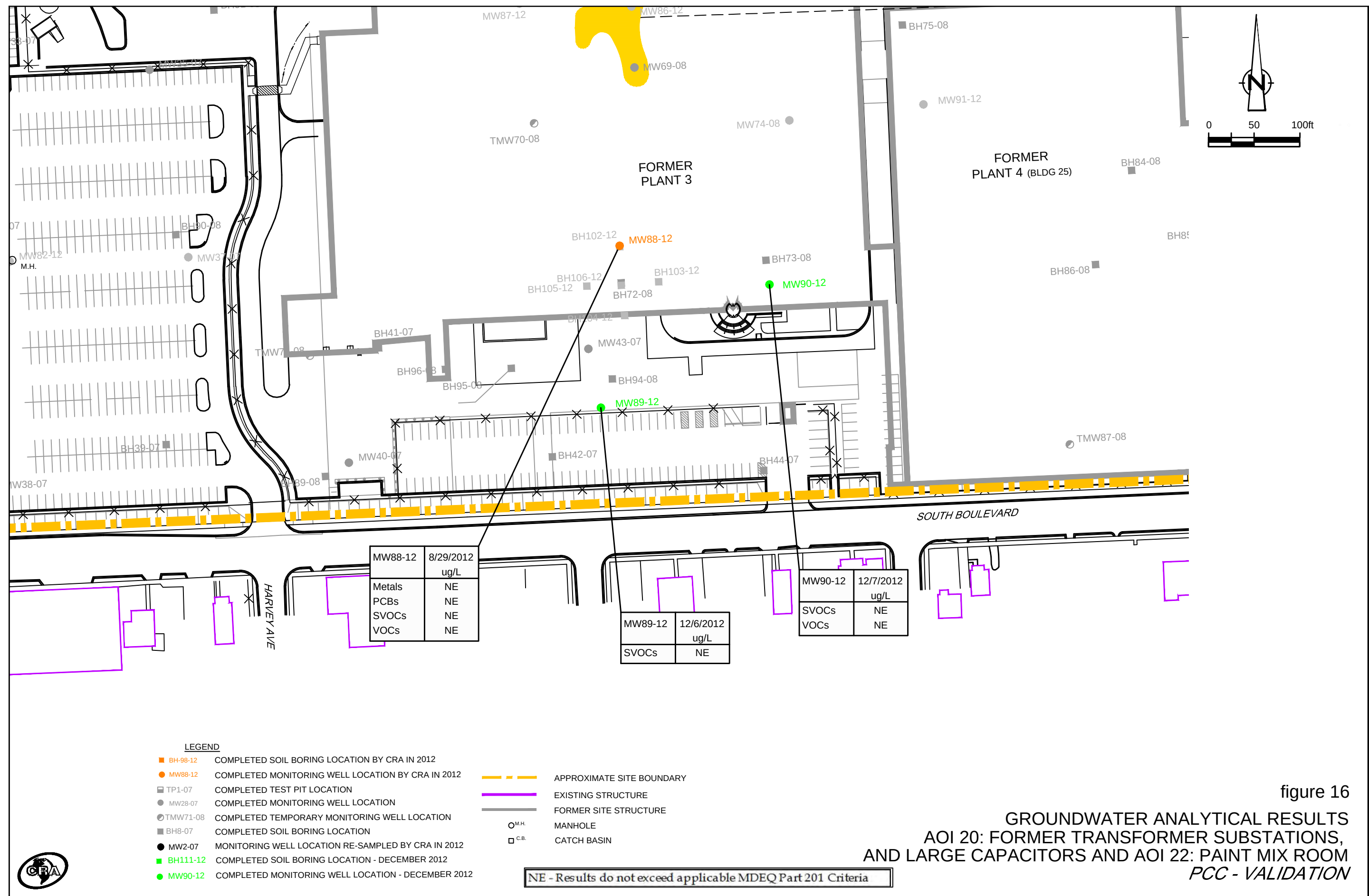
figure 12
SOIL ANALYTICAL RESULTS
AOI 5 : USTs
FORMER PLANT 3
PCC - VALIDATION











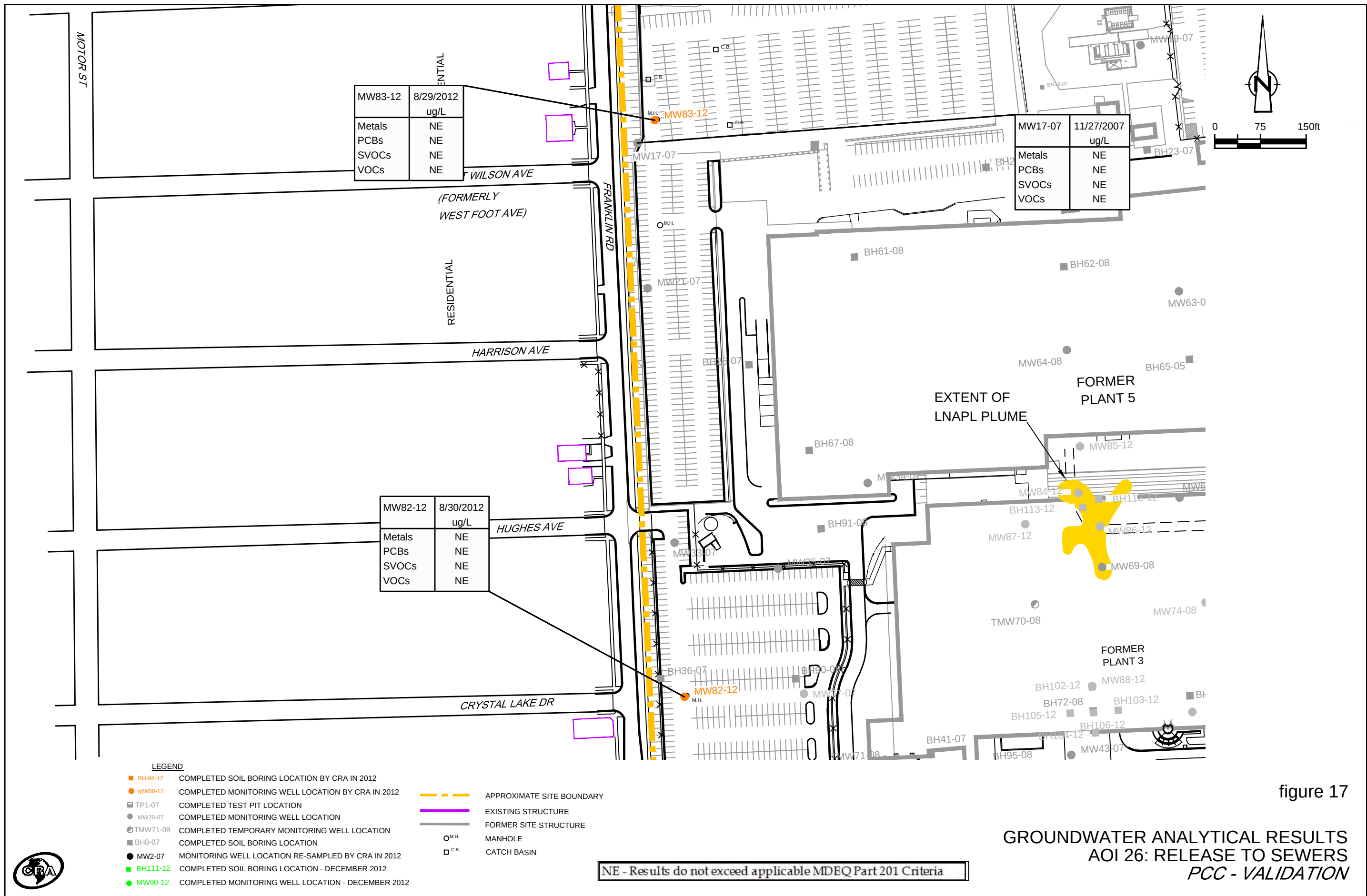


figure 17

GROUNDWATER ANALYTICAL RESULTS
 AOI 26: RELEASE TO SEWERS
 PCC - VALIDATION



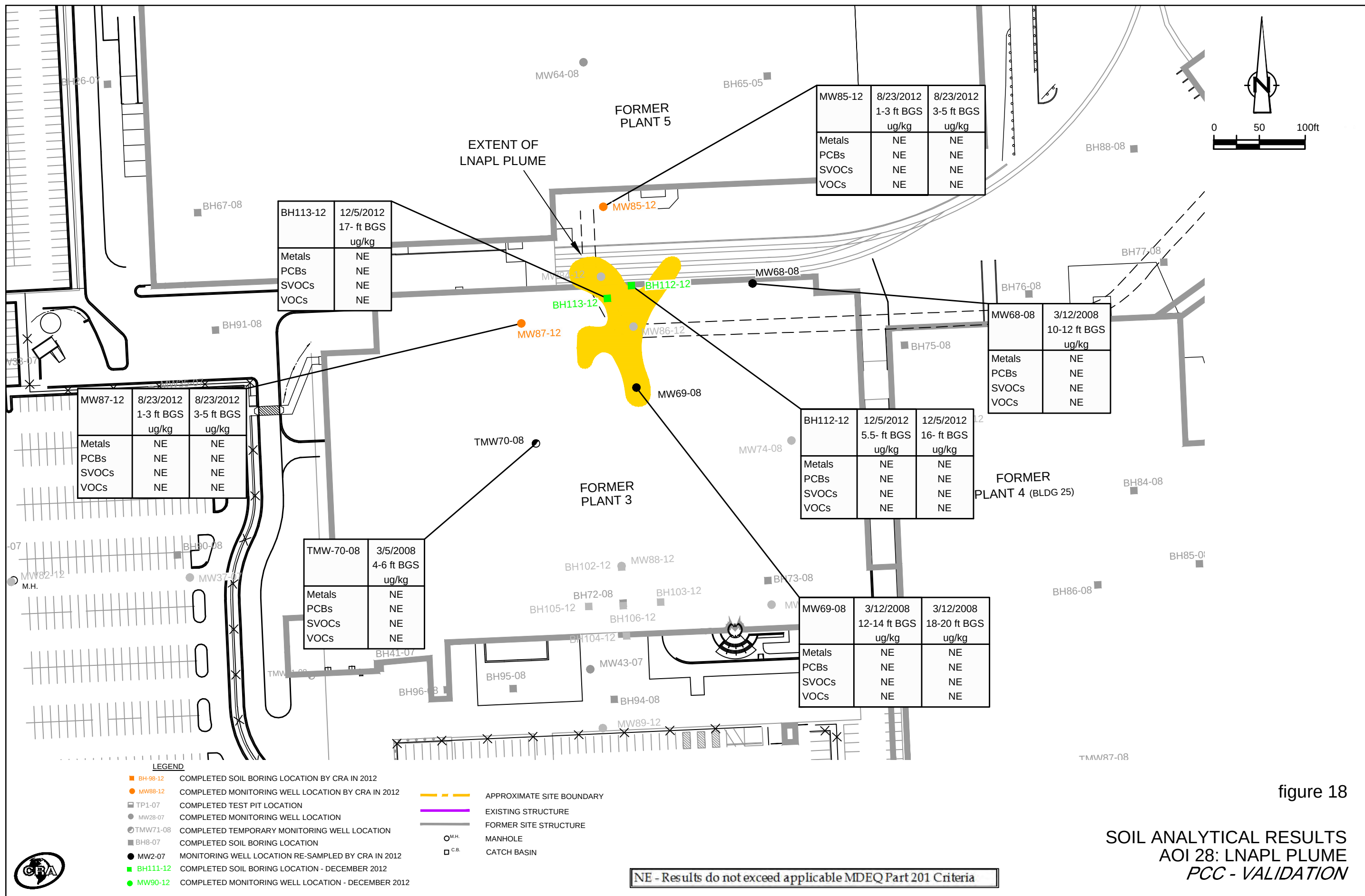


figure 18

SOIL ANALYTICAL RESULTS
AOI 28: LNAPL PLUME
PCC - VALIDATION

TABLES

TABLE 1
MONITOR WELL CONSTRUCTION DETAILS
PCC VALIDATION CENTER
PONTIAC, MICHIGAN

<i>Well ID</i>	<i>Date Installed</i>	<i>Ground Surface</i>	<i>Top of Riser</i>	<i>Screened Interval</i>		<i>Screened Interval</i>		<i>Groundwater Elevation 10/2/2012</i>
		<i>Elevation (ft AMSL)</i>	<i>Elevation (ft AMSL)</i>	<i>Top (ft bgs)</i>	<i>Bottom (ft bgs)</i>	<i>Top (ft AMSL)</i>	<i>Bottom (ft AMSL)</i>	
MW2-07	10/12/2007	936.88	936.77	12	25	924.88	911.88	923.73
MW4-07	10/11/2007	938.15	937.82	5.5	15.5	932.65	922.65	932.80
MW7-07	10/12/2007	937.94	937.55	10	15	927.94	922.94	927.01
MW10-07	10/15/2007	941.43	941.02	3.5	13.5	937.93	927.93	937.56
MW11-07	10/16/2007	954.59	954.11	7	12	947.59	942.59	946.94
MW13-07	10/18/2007	953.04	956.28	7	14	946.04	939.04	Dry
MW15-07	10/16/2007	960.74	960.42	9	14	951.74	946.74	949.71
MW16-07	10/18/2007	956.06	955.87	6	16	950.06	940.06	Dry
MW17-07	10/16/2007	952.54	952.08	3	10	949.54	942.54	942.68
MW19-07	10/17/2007	959.95	959.68	8	13	951.95	946.95	949.89
MW20-07	10/17/2007	960.21	960.03	6.5	13	953.71	947.21	Dry
MW21-07	12/4/2007	952.28	952.08	10.5	20.5	941.78	931.78	942.12
MW27-07	12/7/2007	946.92	946.56	3	13	943.92	933.92	Dry
MW28-07	10/18/2007	960.20	960.07	10	20	950.20	940.20	Dry
MW33-07	12/4/2007	947.01	946.49	10.5	20.5	936.51	926.51	930.61
MW34-07	12/4/2007	951.11	950.80	11	16	940.11	935.11	943.53
MW35-07	12/4/2007	946.58	946.39	6	11	940.58	935.58	941.59
MW37-07	12/4/2007	947.22	946.87	12.5	25.5	934.72	921.72	930.52
MW38-07	12/4/2007	949.38	949.15	9.5	14.5	939.88	934.88	943.53
MW40-07	12/6/2007	948.74	948.41	11	16	937.74	932.74	939.61
MW43-07	12/6/2007	950.05	949.75	7	15	943.05	935.05	Dry
MW48-07	10/9/2007	960.96	960.63	5	15	955.96	945.96	956.63
MW63-08	3/10/2008	947.74	947.45	9.5	15.5	938.24	932.24	941.02
MW64-08	3/10/2008	947.71	947.52	9.5	14.5	938.21	933.21	939.79
MW68-08	3/12/2008	956.87	956.53	9	19	947.87	937.87	944.71
MW69-08	3/13/2008	956.92	956.46	10	20	946.92	936.92	945.37
MW74-08	3/14/2008	956.98	956.77	8	16	948.98	940.98	945.64
MW78-08	3/11/2008	964.06	963.96	8	13	956.06	951.06	953.75
MW79-12	8/22/2012	936.77	936.45	25	30	911.77	906.77	926.46
MW80-12	8/28/2012	930.14	929.72	7	12	923.14	918.14	922.31
MW81-12	8/28/2012	932.16	931.54	14	19	918.16	913.16	923.23
MW82-12	8/23/2012	946.83	946.53	2.5	7.5	944.33	939.33	942.41
MW83-12	8/23/2012	951.98	951.74	6	11	945.98	940.98	943.85
MW84-12	8/28/2012	956.12	955.86	5	20	951.12	936.12	943.28
MW85-12	8/23/2012	947.69	947.13	5	10	942.69	937.69	943.73
MW86-12	8/24/2012	956.82	956.56	8	18	948.82	938.82	945.00
MW87-12	8/23/2012	946.14	945.70	4	9	942.14	937.14	942.24
MW88-12	8/20/2012	956.88	956.29	15.5	20.5	941.38	936.38	942.68
MW89-12	12/3/2012	NS	NS	6	11	NA	NA	NA
MW90-12	12/3/2012	NS	NS	10	15	NA	NA	NA
MW91-12	12/3/2012	NS	NS	16.5	21.5	NA	NA	NA
TMW1S-12	12/4/2012	NS	NS	10	15	NA	NA	NA
TMW1I-12	12/4/2012	NS	NS	17	22	NA	NA	NA
TMW2S-12	12/4/2012	NS	NS	4	6	NA	NA	NA
TMW2I-12	12/4/2012	NS	NS	12	17	NA	NA	NA
TMW3I-12	12/4/2012	NS	NS	12	17	NA	NA	NA
TMW4I-12	12/4/2012	NS	NS	13	18	NA	NA	NA

Notes:

ft AMSL - Feet Above Mean Sea Level.

ft bgs - Feet below ground surface.

MW - Monitoring well.

TMW - Temporary monitoring well.

Dry - Groundwater was not encountered in the well during the last groundwater elevation survey.

NS - Wells currently have not been surveyed.

NA - Data not available

TABLE 2

**SOIL AND GROUNDWATER SAMPLE KEY
PHASE III ESA AND SUPPLEMENTAL PHASE III ESA
PCC-VALIDATION
PONTIAC, MICHIGAN**

Sample ID	Location Description	Boring Interval (ft. BGS)	Collection Date (mm/dd/yy)	Sample Type	Matrix Code	QAQC	Lab ID	Analysis
SO-17322-082012-DR-001	BH102-12	0-2	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-002	BH102-12	12-14	8/20/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082012-DR-003	BH102-12	22-24	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-004	BH103-12	0-2	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-005	BH103-12	12-14	8/20/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082012-DR-006	BH103-12	23-25	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-007	BH104-12	0-2	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-008	BH104-12	12-14	8/20/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082012-DR-009	BH104-12	22-24	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-010	BH105-12	0-2	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-011	BH105-12	12-14	8/20/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082012-DR-012	BH105-12	18-20	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-013	BH105-12	18-20	8/20/2012	Soil	SO	DUP	ALS	PCBS
SO-17322-082012-DR-014	BH106-12	15-17	8/20/2012	Soil	SO		ALS	PCBS
SO-17322-082012-DR-015	BH106-12	18-20	8/20/2012	Soil	SO	MS/MSD	ALS	PCBS
SO-17322-082112-DR-016	BH97-12	12-14	8/21/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082112-DR-017	BH97-12	18-20	8/21/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS
SO-17322-082112-DR-018	BH101-12	0-2	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-019	BH101-12	9-11	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-020	BH101-12	13-15	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-021	BH98-12	0-2	8/21/2012	Soil	SO	MS/MSD	ALS	SVOCs
SO-17322-082112-DR-022	BH98-12	9-11	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-023	BH98-12	13-15	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-024	BH99-12	0-2	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-025	BH99-12	9-11	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-026	BH99-12	13-15	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-027	BH100-12	0-2	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-028	BH100-12	9-11	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-029	BH100-12	13-15	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-030	BH100-12	13-15	8/21/2012	Soil	SO	DUP	ALS	SVOCs
SO-17322-082112-DR-031	BH107-12	9-11	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-032	BH107-12	13-15	8/21/2012	Soil	SO		ALS	SVOCs
SO-17322-082112-DR-033	MW79-12	0-2	8/21/2012	Soil	SO		ALS	TCL VOCs, PCBS
SO-17322-082112-DR-034	MW79-12	17-19	8/21/2012	Soil	SO		ALS	TCL VOCs, PCBS
SO-17322-082112-DR-035	MW79-12	20-22	8/21/2012	Soil	SO		ALS	TCL VOCs, PCBS
TB	TRIP	NA	NA	NA	NA	TRIP	ALS	TCL VOCs
SO-17322-082312-DR-036	MW87-12	1-3	8/23/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
SO-17322-082312-DR-037	MW87-12	1-3	8/23/2012	Soil	SO	DUP	ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
SO-17322-082312-DR-038	MW87-12	3-5	8/23/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
SO-17322-082312-DR-039	MW85-12	1-3	8/23/2012	Soil	SO	MS/MSD	ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
SO-17322-082312-DR-040	MW85-12	3-5	8/23/2012	Soil	SO		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
TB	TRIP	NA	NA	NA	NA	TRIP	ALS	TCL VOCs
TB	TRIP	NA	NA	NA	NA	TRIP	ALS	TCL VOCs
GW-17322-082812-DD-036	MW2-07	NA	8/28/2012	Groundwater	WG	MS/MSD	ALS	TCL VOCs, PCBS
GW-17322-082812-DD-037	MW37-07	NA	8/28/2012	Groundwater	WG	MS/MSD	ALS	SVOCs
GW-17322-082812-DD-038	MW64-08	NA	8/28/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs
GW-17322-082812-DD-039	MW63-08	NA	8/28/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs
GW-17322-082812-DD-040	MW68-08	NA	8/28/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs
GW-17322-082812-DD-041	MW74-08	NA	8/28/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs
GW-17322-082912-DD-042	MW79-12	NA	8/29/2012	Groundwater	WG		ALS	TCL VOCs, PCBS
GW-17322-082912-DD-043	MW83-12	NA	8/29/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-082912-DD-044	MW88-12	NA	8/29/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-082912-DD-045	MW85-12	NA	8/29/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-046	MW81-12	NA	8/30/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-047	MW84-12	NA	8/30/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-048	MW84-12	NA	8/30/2012	Groundwater	WG	DUP	ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-049	MW80-12	NA	8/30/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-050	MW82-12	NA	8/30/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
GW-17322-083012-DD-051	MW87-12	NA	8/30/2012	Groundwater	WG		ALS	TCL VOCs, SVOCs, PCBS, TAL METALS
TB	TRIP	NA	NA	NA	NA	TRIP	ALS	TCL VOCs
S-17322-120412-DD-001	TMW41-12	8.0	12/4/2012	Soil	SO		ALS	VOCs
S-17322-120412-DD-002	TMW31-12	7.5	12/4/2012	Soil	SO		ALS	VOCs
S-17322-120412-DD-003	TMW25-12	5.5	12/4/2012	Soil	SO		ALS	VOCs
S-17322-120412-DD-004	TMW11-12	13.0	12/4/2012	Soil	SO		ALS	VOCs
S-17322-120512-DD-005	BH112-12	5.5	12/5/2012	Soil	SO		ALS	VOC SVOC PCB Metals
S-17322-120512-DD-006	BH112-12	16.0	12/5/2012	Soil	SO		ALS	VOC SVOC PCB Metals

TABLE 2

**SOIL AND GROUNDWATER SAMPLE KEY
PHASE III ESA AND SUPPLEMENTAL PHASE III ESA
PCC-VALIDATION
PONTIAC, MICHIGAN**

Sample ID	Location Description	Boring Interval (ft. BGS)	Collection Date (mm/dd/yy)	Sample Type	Matrix Code	QAQC	Lab ID	Analysis
S-17322-120512-DD-007 TB-17322	BH113-12 -	17.0 -	12/5/2012 -	Soil -	SO QC	Trip	ALS	VOC SVOC PCB Metals
							ALS	VOCs
S-17322-120512-DD-008	BH109-12	0-2	12/5/2012	Soil	SO	DUP MS/MSD	ALS	PAH
S-17322-120512-DD-009	BH109-12	3-4	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-010	BH110-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-011	BH110-12	3-4	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-012	BH111-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-013	BH111-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-014	BH111-12	3-4	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-015	BH114-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-016	BH114-12	3-4	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-017	BH115-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-018	BH115-12	3-4	12/5/2012	Soil	SO	Trip	ALS	PAH
S-17322-120512-DD-019	BH116-12	0-2	12/5/2012	Soil	SO		ALS	PAH
S-17322-120512-DD-020	BH116-12	3-4	12/5/2012	Soil	SO		ALS	PAH
GW-17322-120512-CT-021	TMW11-12	NA	12/5/2012	Groundwater	WG		ALS	VOCs
GW-17322-120512-CT-022	TMW1S-12	NA	12/5/2012	Groundwater	WG		ALS	VOCs
GW-17322-120612-CT-023	MW91-12	NA	12/6/2012	Groundwater	WG		ALS	VOCs
GW-17322-120612-CT-024	MW89-12	NA	12/6/2012	Groundwater	WG		ALS	PAHs (VOCs on hold)
GW-17322-120712-CT-025	TMW4I-12	NA	12/7/2012	Groundwater	WG		ALS	VOCs
GW-17322-120712-CT-026	TMW3I-12	NA	12/7/2012	Groundwater	WG		ALS	VOCs
GW-17322-120712-CT-027	TMW2S-12	NA	12/7/2012	Groundwater	WG		ALS	VOCs
GW-17322-120712-CT-028	TMW2I-12	NA	12/7/2012	Groundwater	WG	Trip	ALS	VOCs
GW-17322-120712-CT-029 TB-17322	MW90-12 -	NA -	12/7/2012 -	Groundwater -	WG QC		ALS	VOCs and PAHs VOCs

TABLE 3
SOIL ANALYTICAL RESULTS
AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1
PCC - VALIDATION
PONTIAC, MICHIGAN

		Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic								
Sample Location:				Cleanup Criteria ⁽¹⁾			BH1-07	MW2-07	MW2-07	MW2-07	MW7-07	MW4-07
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	8-10 ft BGS	0-2 ft BGS	11.75-13.75 ft BGS	8-10 ft BGS	0-2 ft BGS	15-17 ft BGS
Sample Date:		Background	Background	Drinking Water	Drinking Water	Surface Water	12/07/2007	10/12/2007	10/12/2007	10/12/2007	10/12/2007	10/11/2007
Sample Type:		Value(2)	Value(2)	Protection	Protection	nterface Protection						
Parameters	Units	a	a	b	c	d						
VOCs												
1,1,1,2-Tetrachloroethane	ug/kg	NA	NA	1500	6400	ID	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	4.1 U	4.2 U	--	--	4.7 U	3.5 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	4.1 U	4.2 U	--	--	4.7 U	3.5 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	4.1 U	4.2 U	--	--	4.7 U	3.5 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	8.1 U	8.5 U	--	--	9.5 U	7.0 UJ
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	4.1 U	4.2 U	--	--	4.7 U	3.5 UJ
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	16 U	17 U	--	--	19 U	14 U
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	16 UJ	17 U	--	--	19 U	14 UJ
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	16 U	17 U	--	--	19 U	14 U
Acetone	ug/kg	NA	NA	15000	42000	34000	16 U	17 U	--	--	19 U	14 U
Benzene	ug/kg	NA	NA	100	100	4000 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	4.1 U	4.2 U	--	--	4.7 U	3.5 U
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	4.1 U	4.2 U	--	--	4.7 U	3.5 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.1 U	8.5 U	--	--	9.5 U	7.0 U
Dibromochloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ

TABLE 3

SOIL ANALYTICAL RESULTS
AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location: Sample Depth: Sample Date: Sample Type:	<u>Michigan Act 451, Part 201 Cleanup Criteria</u> <u>and Part 213 Risk-based Screening Levels:</u> <u>Residential and Non-Residential Generic</u>											
	Sandy (shallower) soils	Clay (deeper) soils	<u>Cleanup Criteria</u> ⁽¹⁾				BH1-07	MW2-07	MW2-07	MW2-07	MW7-07	MW4-07
	Selected	Selected	Residential	Non-Residential	Groundwater	8-10 ft BGS	0-2 ft BGS	11.75-13.75 ft BGS	8-10 ft BGS	0-2 ft BGS	15-17 ft BGS	
	Background Value(2)	Background Value(2)	Drinking Water Protection	Drinking Water Protection	Surface Water nterface Protection	12/07/2007	10/12/2007	10/12/2007	10/12/2007	10/12/2007	10/11/2007	
Parameters	Units	a	a	b	c	d						
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	R	8.5 U	--	--	9.5 U	7.0 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.1 U	8.5 U	--	--	9.5 U	7.0 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	16 U	17 U	--	--	19 U	14 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	4.1 U	4.2 U	--	--	4.7 U	1.2 J
Styrene	ug/kg	NA	NA	2700	2700	2100 X	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Toluene	ug/kg	NA	NA	16000	16000	5400	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.1 UJ	4.2 U	--	--	4.7 U	3.5 UJ
Trichloroethene	ug/kg	NA	NA	100	100	4000 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Trichlorofluoromethane (CFC-11)	ug/kg	NA	NA	52000	150000	NA	4.1 UJ	4.2 U	--	--	4.7 U	3.5 U
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	NA	550000 C	550000 C	1700	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Vinyl chloride	ug/kg	NA	NA	40	40	260 X	4.1 U	4.2 U	--	--	4.7 U	3.5 U
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	8.1 UJ	8.5 U	--	--	9.5 U	7.0 UJ
SVOCs												
All SVOCs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE
Metals												
All Metals	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE
PCBs												
All PCBs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE
General Chemistry												
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	220 UJ	210 U	--	--	220 U	680 ^{ad}
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	--	--	--	--	--	--
Total solids	%	NA	NA	NA	NA	NA	91.0	94.3	84.8	84.7	90.5	90.9

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 3
SOIL ANALYTICAL RESULTS
AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1
PCC - VALIDATION
PONTIAC, MICHIGAN

Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels:																			
		Sandy (shallower) soils	Clay (deeper) soils	Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾			BH5-07	MW11-07	BH18-07	MW19-07	MW20-07	MW20-07	BH24-07	MW79-12	MW79-12	MW79-12	TMW4I-12	TMW3I-12	
Sample Location:		Selected	Selected	Residential	Non-Residential	Groundwater	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	17-19 ft BGS	20-22 ft BGS	8 ft BGS	7.5 ft BGS	
Sample Depth:		Background	Background	Drinking Water	Drinking Water	Surface Water	10/15/2007	10/16/2007	10/16/2007	10/17/2007	10/17/2007	10/17/2007	10/17/2007	10/17/2007	08/21/2012	08/21/2012	08/21/2012	12/04/2012	12/04/2012
Sample Date:		Value(2)	Value(2)	Protection	Protection	nterface Protection							Duplicate						
Sample Type:																			
Parameters	Units	a	a	b	c	d													
VOCs																			
1,1,1,2-Tetrachloroethane	ug/kg	NA	NA	1500	6400	ID	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 UJ	4.7 UJ	5.5 UJ	33 U	34 U	33 U	36 U	36 U	36 U
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 UJ	4.7 UJ	5.5 UJ	33 U	34 U	33 U	36 U	36 U	36 U
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	3.7 U	3.6 U	3.6 U	3.8 U	2.5 J	4.7 UJ	5.5 UJ	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	7.4 U	7.2 U	7.3 U	7.5 U	7.5 UJ	9.4 UJ	11 UJ	33 U	34 U	33 U	36 U	36 U	36 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	3.7 U	0.34 J	3.6 U	3.8 U	3.8 UJ	4.7 UJ	5.5 UJ	33 U	34 U	33 U	36 U	36 U	36 U
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	3.7 U	3.6 U	3.6 U	3.8 U	2.2 J	4.7 UJ	5.5 UJ	--	--	--	--	--	--
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	3.7 U	0.32 J	3.6 U	3.8 U	3.8 UJ	4.7 UJ	5.5 UJ	33 U	34 U	33 U	36 U	36 U	36 U
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	3.7 U	3.6 U	3.6 U	3.8 U	3.8 UJ	4.7 UJ	5.5 UJ	33 U	34 U	33 U	36 U	36 U	36 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	15 U	14 U	2.7 J	1.3 J	8.8 J	3.9 J	22 U	220 U	220 U	220 U	240 U	240 U	240 U
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	15 U	14 U	15 U	15 U	15 U	19 UJ	22 U	33 U	34 U	33 U	36 U	36 U	36 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	15 U	14 U	15 U	15 U	15 U	19 U	22 U	33 U	34 U	33 U	36 U	36 U	36 U
Acetone	ug/kg	NA	NA	15000	42000	34000	15 U	14 U	25	5.8 J	43 J	14 J	22 UJ	75 J	160 B	110 J	120 U	120 U	120 U
Benzene	ug/kg	NA	NA	100	100	4000 X	3.7 U	3.6 U	3.6 U	3.8 U	0.23 J	0.24 J	5.5 U	33 U	34 U	33 U	130 ^{bc}	36 U	36 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	3.7 U	3.6 UJ	3.6 UJ	3.8 U	3.8 U	4.7 U	5.5 U	83 U	84 U	82 U	89 U	91 U	91 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	3.7 U	3.6 U	3.6 U	3.8 U	1.0 J	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	110 U	110 U	110 U	120 U	120 U	120 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	110 U	110 U	110 U	120 U	120 U	120 U
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	7.4 U	7.2 U	7.3 U	7.5 U	7.5 U	9.4 U	11 U	33 U	34 U	33 U	36 U	36 U	36 U
Dibromochloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	3.7 U	3.6 UJ	3.6 UJ	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U	36 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	3.7 U	3.6 U	3.6 U	3.8 U	0.26 J	4.7 UJ	5.5 U	33 U	34 U	33 U	33 J	36 U	36 U

TABLE 3
SOIL ANALYTICAL RESULTS
AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location: Sample Depth: Sample Date: Sample Type:	<u>Michigan Act 451, Part 201 Cleanup Criteria</u> <u>and Part 213 Risk-based Screening Levels:</u> <u>Residential and Non-Residential Generic</u>																	
	Sandy (shallower) soils	Clay (deeper) soils	Cleanup Criteria ⁽¹⁾				BH5-07	MW11-07	BH18-07	MW19-07	MW20-07	MW20-07	BH24-07	MW79-12	MW79-12	MW79-12	TMW4I-12	TMW3I-12
	Selected	Selected	Residential	Non-Residential	Groundwater	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	17-19 ft BGS	20-22 ft BGS	8 ft BGS	7.5 ft BGS
	Background Value(2)	Background Value(2)	Drinking Water Protection	Drinking Water Protection	Surface Water nterface Protection	10/15/2007	10/16/2007	10/16/2007	10/17/2007	10/17/2007	10/17/2007	10/17/2007	10/17/2007	08/21/2012	08/21/2012	08/21/2012	12/04/2012	12/04/2012
Parameters	Units	a	a	b	c	d							Duplicate					
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	7.4 U	7.2 U	7.3 U	7.5 U	7.5 U	9.4 U	11 U	220 U	220 U	220 U	240 U	240 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	7.4 U	7.2 U	7.3 U	7.5 U	7.5 U	9.4 U	11 U	33 U	34 U	33 U	36 U	36 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	15 U	14 U	15 U	15 U	15 U	19 U	22 U	33 U	34 U	33 U	36 U	36 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	47	33 U	36 U	36 U
Styrene	ug/kg	NA	NA	2700	2700	2100 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U
Toluene	ug/kg	NA	NA	16000	16000	5400	0.21 J	3.6 U	3.6 U	3.8 U	0.26 J	0.56 J	5.5 U	33 U	34 U	33 U	150	36 U
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 UJ	5.5 U	33 U	34 U	33 U	36 U	36 U
Trichloroethene	ug/kg	NA	NA	100	100	4000 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U
Trichlorofluoromethane (CFC-11)	ug/kg	NA	NA	52000	150000	NA	3.7 U	3.6 UJ	3.6 UJ	3.8 U	3.8 UJ	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	NA	550000 C	550000 C	1700	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U
Vinyl chloride	ug/kg	NA	NA	40	40	260 X	3.7 U	3.6 U	3.6 U	3.8 U	3.8 U	4.7 U	5.5 U	33 U	34 U	33 U	36 U	36 U
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	7.4 U	7.2 U	7.3 U	7.5 U	3.1 J	0.87 J	11 U	100 U	100 U	99 U	230	110 U
SVOCs																		
All SVOCs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Metals																		
All Metals	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PCBs																		
All PCBs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																		
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	210 U	230 U	220 U	130 J	130 J	220 U	230 U	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	3.8	11	8.7	16	18
Total solids	%	NA	NA	NA	NA	NA	94.8	86.5	89.3	94.5	90.2	90.0	86.1	--	--	--	--	--

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imp
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 4
GROUNDWATER ANALYTICAL RESULTS
AOI 1 - HISTORICAL OPERATIONS - FORMER PLANT 1
PCC - VALIDATION
PONTIAC, MICHIGAN

<i>Michigan Act 451, Part 201 Cleanup Criteria and Part 213</i>																			
<i>Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</i>																			
<i>Sample Location:</i>					MW2-07	MW2-07	MW4-07	MW7-07	MW11-07	MW19-07	MW79-12	MW80-12	MW81-12	TMW11-12	TMW1S-12	TMW2I-12	TMW2S-12	TMW3I-12	TMW4I-12
<i>Sample Date:</i>					11/28/2007	08/28/2012	11/28/2007	11/28/2007	11/27/2007	11/27/2007	08/29/2012	08/30/2012	08/30/2012	12/05/2012	12/05/2012	12/07/2012	12/07/2012	12/07/2012	12/07/2012
<i>Sample Type:</i>																			
		Residential	NonResidential	Groundwater															
		Drinking Water	Drinking Water	Surface Water															
				Interface															
<i>Parameters</i>	<i>Units</i>	<i>a</i>	<i>b</i>	<i>c</i>															
<i>SVOCs</i>																			
All SVOCs	ug/L	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<i>Metals</i>																			
Aluminum	ug/L	50 V	50 V	NA	11.6 J	--	14.2 J	50.0 U	523 ^{ab}	463 ^{ab}	--	30	89 ^{ab}	--	--	--	--	--	--
Antimony	ug/L	6 A	6 A	130 X	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	--	0.19 J	0.35 J	--	--	--	--	--	--
Arsenic	ug/L	10 A	10 A	10	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	--	2.5 J	5 U	--	--	--	--	--	--
Barium	ug/L	2000 A	2000 A	G	394	--	79.5	197	52.6 J	12.0 J	--	98	280	--	--	--	--	--	--
Beryllium	ug/L	4 A	4 A	G	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	2 U	2 U	--	--	--	--	--	--
Cadmium	ug/L	5 A	5 A	G,X	1.0 U	--	1.0 U	0.71 J	1.0 U	1.0 U	--	0.052 J	0.13 J	--	--	--	--	--	--
Calcium	ug/L	NA	NA	NA	323000	--	226000	324000	67500	29400	--	--	--	--	--	--	--	--	--
Chromium	ug/L	100 A	100 A	11	5.1	--	5.0 U	5.0 U	5.0 U	5.0 U	--	0.97 J	1.4 J	--	--	--	--	--	--
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	5.1 J	--	5 UJ	5 UJ	5 UJ	5 UJ	--	--	--	--	--	--	--	--	--
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	10 UJ	--	10 UJ	10 UJ	10 UJ	10 UJ	--	--	--	--	--	--	--	--	--
Cobalt	ug/L	40	100	100	2.5 J	--	7.0 U	2.1 J	7.0 U	7.0 U	--	1.1 J	4.1 J	--	--	--	--	--	--
Copper	ug/L	1000 E	1000 E	G	2.0 U	--	2.4 U	2.2 U	2.1 U	2.5 U	--	3 J	6.6	--	--	--	--	--	--
Iron	ug/L	300 E	300 E	NA	1810 J ^{ab}	--	87.1 J	125 J	879 J ^{ab}	829 J ^{ab}	--	410 ^{ab}	1600 ^{ab}	--	--	--	--	--	--
Lead	ug/L	4 L	4 L	G,X	3.0 U	--	3.0 U	3.0 U	3.0 U	3.0 U	--	0.092 J	0.25 J	--	--	--	--	--	--
Magnesium	ug/L	400000	1100000	NA	56000	--	16200	70900	23400	4700	--	--	--	--	--	--	--	--	--
Manganese	ug/L	50 E	50 E	G,X	2150 ^{ab}	--	57.7 ^{ab}	192 ^{ab}	245 ^{ab}	14.5 J	--	150 ^{ab}	190 ^{ab}	--	--	--	--	--	--
Mercury	ug/L	2 A	2 A	0.0013	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	0.2 U	0.2 U	--	--	--	--	--	--
Nickel	ug/L	100 A	100 A	G	6.7 J	--	20.0 U	3.5 J	4.0 J	20.0 U	--	10	33	--	--	--	--	--	--
Potassium	ug/L	NA	NA	NA	5270 J	--	11000 J	7370 J	1860 J	2370 J	--	--	--	--	--	--	--	--	--
Selenium	ug/L	50 A	50 A	5	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	--	2.8 J	7.4 ^c	--	--	--	--	--	--
Silver	ug/L	34	98	0.2 M	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	5 U	0.3 J ^c	--	--	--	--	--	--
Sodium	ug/L	120000	350000	NA	876000 ^{ab}	--	643000 ^{ab}	488000 ^{ab}	444000 ^{ab}	284000 ^a	--	--	--	--	--	--	--	--	--
Thallium	ug/L	2 A	2 A	3.7 X	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	0.088 J	5 U	--	--	--	--	--	--
Vanadium	ug/L	4.5	62	27	4.0 U	--	4.0 U	4.0 U	4.0 U	3.2	--	5 U	5 U	--	--	--	--	--	--
Zinc	ug/L	2400	5000 E	G	5.8 J	--	20.0 U	5.8 J	6.0 J	10.5 J	--	2.1 J	5.6 J	--	--	--	--	--	--
<i>PCBs</i>																			
Aroclor-1016 (PCB-1016)	ug/L	0.5 A	0.5 A	0.2 M	0.10 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/L	0.5 A	0.5 A	0.2 M	0.10 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1232 (PCB-1232)	ug/L	0.5 A	0.5 A	0.2 M	0.10 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1242 (PCB-1242)	ug/L	0.5 A	0.5 A	0.2 M	0.10 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1248 (PCB-1248)	ug/L	0.5 A	0.5 A	0.2 M	0.33 ^c	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/L	0.5 A	0.5 A	0.2 M	0.10 U	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/L	0.5 A	0.5 A	0.2 M	0.29 ^c	0.25 U	0.10 U	0.10 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	--	--	--	--	--	--
Total PCBs	ug/L	0.5 A	0.5 A	0.2 M	0.62 ^{abc}	--	0.10 U	0.10 U	0.10 U	0.10 U	--	--	--	--	--	--	--	--	--
<i>General Chemistry</i>																			
Cyanide (amenable)	ug/L	200 A	200 A	NA	5 U	--	5 U	5 U	5 U	5 U	--	--	--	--	--	--	--	--	--

Notes:
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 5
SOIL ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

		Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾			BH30-07	MW32-07	BH41-07	BH42-07	BH42-07	BH44-07	MW48-07	BH61-08	BH62-08	MW63-08	MW64-08	BH65-08
Sample Location:		Selected	Selected	Residential	Non-Residential	Groundwater	0-2 ft BGS	15-17 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	5-7 ft BGS	8-10 ft BGS	9-11 ft BGS	10-12 ft BGS	0-11.75 ft BGS	10-12 ft BGS
Sample Depth:																		
Sample Date:		Background	Background	Drinking Water	Drinking Water	Surface Water	10/17/2007	12/07/2007	12/05/2007	12/05/2007	12/05/2007	12/06/2007	10/09/2007	03/10/2008	03/10/2008	03/10/2008	03/10/2008	03/11/2008
Sample Type:		Value(2)	Value(2)	Protection	Protection	Interface Protection					Duplicate							
Parameters	Units	a	a	b	c	d												
VOCs																		
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	46 U	3.9 U	3.3 U	4.4 U
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	230 U	3.9 U	3.3 U	4.4 UJ
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	93 U	3.9 U	3.3 U	4.4 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	9.0 U	--	8.3 U	8.4 U	7.7 U	9.2 U	8.7 UJ	8.5 UJ	230 UJ	7.8 U	6.6 U	8.7 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	93 U	3.9 U	3.3 U	4.4 U
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	93 U	3.9 U	3.3 U	4.4 U
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	93 U	3.9 U	3.3 U	4.4 U
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 UJ	93 U	3.9 U	3.3 U	4.4 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	18 U	--	2.3 J	5.3 J	11 J	9.6 J	17 UJ	17 U	700 U	16 U	13 U	17 U
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	18 U	--	17 UJ	17 U	15 U	18 UJ	17 UJ	17 U	2300 U	16 U	13 U	17 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	18 U	--	17 U	17 U	15 U	18 U	17 UJ	17 U	2300 U	16 U	13 U	17 U
Acetone	ug/kg	NA	NA	15000	42000	34000	18 UJ	--	6.6 J	20	43	33	24 J	17 U	700 U	16 U	13 U	17 U
Benzene	ug/kg	NA	NA	100	100	4000 X	4.5 U	--	0.22 J	4.2 U	3.9 U	0.55 J	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	93 U	3.9 U	3.3 U	4.4 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	93 UJ	3.9 U	3.3 U	4.4 U
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	4.5 U	--	0.41 J	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 UJ	3.9 U	3.3 U	4.4 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	4.5 U	--	0.88 J	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 UJ	3.9 U	3.3 U	4.4 U
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	9.0 U	--	0.53 J	8.4 U	7.7 U	9.2 U	0.73 J	8.5 U	1100 U	7.8 U	6.6 U	8.7 U
Dibromochloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 UJ	3.9 U	3.3 U	4.4 U
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	93 U	3.9 U	3.3 U	4.4 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	4.5 U	--	21 J	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	9.0 U	--	R	R	R	R	8.7 UJ	8.5 U	1100 U	7.8 U	6.6 U	8.7 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	9.0 U	--	8.3 U	8.4 U	7.7 U	9.2 U	8.7 UJ	8.5 U	1100 U	7.8 U	6.6 U	8.7 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	18 U	--	17 U	17 U	15 U	18 U	17 UJ	17 U	230 U	16 U	13 U	17 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Styrene	ug/kg	NA	NA	2700	2700	2100 X	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 UJ	3.9 U	3.3 U	4.4 U
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	4.5 U	--	2.1 J	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Toluene	ug/kg	NA	NA	16000	16000	5400	4.5 U	--	4.1 UJ	4.2 U	3.9 U	0.36 J	4.3 UJ	4.2 U	93 U	3.9 U	3.3 U	4.4 U
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.5 U	--	4.1 UJ	4.2 U	3.9 U	4.6 UJ	4.3 UJ	4.2 U	46 UJ	3.9 U	3.3 U	4.4 U
Trichloroethene	ug/kg	NA	NA	100	100	4000 X	4.5 U	--	2.7 J	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	46 U	3.9 U	3.3 U	4.4 U
Trichlorofluoromethane (CFC-11)	ug/kg	NA	NA	52000	150000	NA	4.5 UJ	--	4.1 UJ	4.2 UJ	3.9 UJ	4.6 UJ	4.3 UJ	1.2 J	93 U	3.9 U	3.3 U	4.4 U
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	NA	550000 C	550000 C	1700	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	230 U	3.9 U	3.3 U	4.4 U
Vinyl chloride	ug/kg	NA	NA	40	40	260 X	4.5 U	--	4.1 U	4.2 U	3.9 U	4.6 U	4.3 UJ	4.2 U	37 U	3.9 U	3.3 U	4.4 U

TABLE 5
SOIL ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

				Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾															
Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Non-Residential			BH30-07	MW32-07	BH41-07	BH42-07	BH42-07	BH44-07	MW48-07	BH61-08	BH62-08	MW63-08	MW64-08	BH65-08		
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	0-2 ft BGS	15-17 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	5-7 ft BGS	8-10 ft BGS	9-11 ft BGS	10-12 ft BGS	0-11.75 ft BGS	10-12 ft BGS		
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	10/17/2007	12/07/2007	12/05/2007	12/05/2007	12/05/2007	12/05/2007	12/06/2007	10/09/2007	03/10/2008	03/10/2008	03/10/2008	03/10/2008	03/11/2008	
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection						Duplicate								
Parameters	Units	a	a	b	c	d													
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	9.0 U	--	2.0 J	8.4 U	7.7 U	9.2 UJ	8.7 UJ	8.5 U	140 U	7.8 U	6.6 U	8.7 U	
SVOCs																			
All SVOCs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
Metals																			
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	1880000	--	7060000	4620000	3250000	5300000	2690000	9680000	6040000	7110000	6250000	3190000	
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	170 UJ	--	180 UJ	250 J	150 J	460 J	110 J	60 J	74 J	77 J	74 J	63 J	
Arsenic	ug/kg	7020	9610	4600	4600	4600	4400	--	3700	2700	2700	2000	3500	2500 J	4700 J	4100 J	4700 J	6000	
Barium	ug/kg	240000	79700	1300000	1300000	G	14700	--	38300	50800 J	16800 J	92500 J	21600	55700	23800	35300	29500	26000	
Beryllium	ug/kg	584	600	51000	51000	G	170 U	--	120 J	91 J	180 U	190 UJ	200 U	440	290	370	330	200	
Cadmium	ug/kg	549	673	6000	6000	G,X	180	--	82 J	270	91 U	470	66 J	250	160	310	260	300	
Calcium	ug/kg	NA	NA	NA	NA	NA	102000000	--	63200000	9370000	7950000	7860000	2750000 J	75800000	64000000	81100000	75800000	75200000	
Chromium	ug/kg	NA	NA	NA	NA	NA	13400	--	11600	9700	5600	12400 J	4400 J	18600	13600	12900	11300	6500	
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	11700	--	11600	8600	5000	10000 J	3700 J	18600	13600	12900	11300	6500	
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	1800	--	920 U	1100	610 J	2400	980 U	900 U	930 U	940 U	880 U	910 U	
Cobalt	ug/kg	NA	NA	NA	NA	NA	3800	--	6900	3800	3000	5800 J	2600 J	7100	6800	8100	7400	4400	
Copper	ug/kg	NA	NA	NA	NA	NA	8800	--	11700	21500	11600	30400	5000 J	15900	16900	21000	18000	18200	
Iron	ug/kg	NA	NA	NA	NA	NA	8830000	--	12200000	8040000	6120000	31900000 ^{abc}	8660000	14900000	12400000	18600000	13900000	9560000	
Lead	ug/kg	NA	NA	NA	NA	NA	4900	--	7000	36500 J	7200 J	78200	6400	7400	9400	8200	6900	6100	
Lead - coarse fraction	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	139000	--	--	--	--	--	--	
Lead - fine fraction	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	237000	--	--	--	--	--	--	
Lead - total (calculated by fine/coarse fraction)	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	175000	--	--	--	--	--	--	
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA	39700000 J ^{abc}	--	14200000	2860000	2140000	2410000 J	941000 J	15700000	11500000	14200000	13700000	10900000	
Manganese	ug/kg	4560000	677000	1000	1000	G, X	541000	--	373000 J	101000 J	91800 J	327000	74000	419000	339000	542000	394000	286000	
Mercury	ug/kg	54.1	52 U	1700	1700	50 M	43 U	--	24 J	740 J ^{ad}	71 J	170 ^{ad}	49 U	25 J	46 U	20 J	44 U	45 U	
Nickel	ug/kg	20000	31300	100000	100000	G	10400	--	14200	9900	5800	10300	4100 J	22200 J	19200 J	21800 J	19200 J	11500 J	
Potassium	ug/kg	1280000	2660000	NA	NA	NA	468000	--	1210000	586000	346000 J	754000	253000 J	2390000	1480000	1710000	1490000	819000	
Selenium	ug/kg	922	803	4000	4000	400	180	--	200 U	270	120 J	160 J	280	550 J	720 J	860 J	650 J	480	
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M	38 J	--	64 J	99	31 J	160	32 J	22 J	26 J	35 J	34 J	24 J	
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA	416000	--	422000	999000	473000	937000	212000	98800	134000	99400	167000	85300 J	
Thallium	ug/kg	190	432	2300	2300	4200 X	210 J	--	120	130	90 J	160	98 U	210	210	230	230	190	
Vanadium	ug/kg	30800	23800	72000	990000	430000	16000	--	16100	11700	10400	12800	6800 J	20200	14400	16700	15500	10100	
Zinc	ug/kg	56300	64100	2400000	5000000	G	27700 J	--	30600	68000 J	21100 J	92400	25500 J	39700 J	33700 J	41700 J	79400 J	34700 J	
PCBs																			
All PCBs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
General Chemistry																			
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	220 U	--	230 U	230 U	230 U	240 U	360 J	230 U	230 U	240 U	220 U	230 U	
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	
Total solids	%	NA	NA	NA	NA	NA	92.6	--	87.2	85.4	87.8	D 98.9 D 8	82.0	88.6	86.2	84.8	90.8	88.0	

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 5
SOIL ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

				Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾			BH67-08	MW68-08	MW69-08	MW69-08	TMW-70-08	MW74-08	MW74-08	MW78-08	MW78-08	BH79-08	TMW-81-08	BH82-08	BH82-08	BH83-08	TMW87-08	BH97-12	BH97-12
Sample Location:	Sandy (shallower) soils	Clay (deeper) soils				8-10 ft BGS	10-12 ft BGS	12-14 ft BGS	18-20 ft BGS	4-6 ft BGS	0-2 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	12-14 ft BGS	4-6 ft BGS	8-10 ft BGS	8-10 ft BGS	10-12 ft BGS	7-9 ft BGS	12-14 ft BGS	18-20 ft BGS
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater																		
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	03/10/2008	03/12/2008	03/12/2008	03/12/2008	03/05/2008	03/14/2008	03/14/2008	03/11/2008	03/11/2008	03/11/2008	03/05/2008	03/12/2008	03/12/2008	03/12/2008	03/12/2008	03/06/2008	08/21/2012	08/21/2012
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection										Duplicate				Duplicate				
Parameters	Units	a	a	b	c	d																	
VOCs																							
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	4.3 U	4.4 U	3.5 UJ	91 UJ	4.9 U	400	1300	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	4.3 U	4.4 U	R	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	18 J	74 J	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	110	260 ^{bc}	3.4 J	1.8 J	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	4.3 U	4.4 U	3.5 UJ	450 U	4.9 U	260 U	460 U	6.4 U	7.0 U	220 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	4.3 U	4.4 U	R	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	460	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	--	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	8.6 U	8.8 U	R	450 U	9.7 U	260 U	460 U	13 U	14 U	220 UJ	8.2 U	7.4 U	8.0 U	11 U	9.9 U	35 U	35 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	4.3 U	4.4 U	3.5 UJ	450 UJ	4.9 U	260 U	460 U	6.4 U	7.0 U	220 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	4.3 U	4.4 U	0.31 J	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	89 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	4.3 U	4.4 U	R	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	230	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	--	--
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	4.3 U	4.4 U	0.40 J	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	89 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	4.3 U	4.4 U	0.47 J	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	89 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	17 U	18 U	14 UJ	1400 UJ	19 U	790 UJ	1400 UJ	25 U	28 U	660 U	3.1 J	15 U	16 U	3.4 J	20 U	230 U	230 U
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	17 U	18 U	14 UJ	4500 U	19 U	2600 UJ	4600 U	25 U	28 U	2200 U	16 U	15 U	16 U	21 U	20 U	35 U	35 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	17 U	18 U	14 UJ	4500 U	19 U	2600 UJ	4600 U	25 U	28 U	2200 U	0.89 J	15 U	16 U	21 U	20 U	35 U	35 U
Acetone	ug/kg	NA	NA	15000	42000	34000	17 U	18 U	14 UJ	1400 UJ	19 UJ	790 UJ	1400 UJ	25 U	28 U	660 U	16 UJ	15 U	16 U	20 J	20 UJ	100 J	87 J
Benzene	ug/kg	NA	NA	100	100	4000 X	4.3 U	4.4 U	3.5 UJ	91 U	0.32 J	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.3 U	4.4 U	3.5 UJ	180 UJ	4.9 U	100 UJ	190 UJ	6.4 U	7.0 U	89 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	4.3 U	4.4 U	3.5 UJ	180 U	4.9 U	100 U	190 U	6.4 U	7.0 U	89 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	4.3 U	4.4 U	3.5 UJ	450 U	R	260 U	460 U	6.4 U	7.0 U	220 U	R	3.7 U	4.0 U	5.3 U	R	86 U	86 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	4.3 U	4.4 U	0.55 J	450 U	0.78 J	260 U	460 U	6.4 U	7.0 U	220 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	4.3 U	4.4 U	3.5 UJ	91 UJ	4.9 U	52 UJ	93 U	6.4 U	7.0 U	44 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	4.3 U	4.4 U	3.5 UJ	450 UJ	R	260 UJ	460 UJ	6.4 U	7.0 U	220 U	R	3.7 U	4.0 U	5.3 U	R	120 U	120 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	4.3 U	4.4 U	3.5 UJ	450 UJ	4.9 U	260 UJ	460 UJ	6.4 U	7.0 U	220 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	120 U	120 U
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 U	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.3 U	4.4 U	3.5 UJ	91 UJ	4.9 U	52 U	93 U	6.4 U	7.0 U	44 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.6 U	8.8 U	6.9 UJ	2200 UJ	0.67 J	1300 UJ	2200 UJ	13 U	14 U	27 J	8.2 U	7.4 U	8.0 U	11 U	9.9 U	35 U	35 U
Dibromochloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	44 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	4.3 U	4.4 U	3.5 UJ	180 U	4.9 U	100 UJ	190 U	6.4 U	7.0 U	89 UJ	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	4.3 U	4.4 U	3.5 UJ	91 U	4.9 U	52 U	93 U	6.4 U	7.0 U	25 J	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	4.3 U	4.4 U	3.5 UJ	170 J	4.9 U	260 U	460 U	6.4 U	7.0 U	54 J	4.1 U	3.7 U	4.0 U	5.3 U	5.0 U	35 U	35 U
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	8.6 U	8.8 U	6.9 UJ	2200 U	R	1300 U	2200 U	13 U	14 U	1100 U	R	7.4 U	8.0 U	11 U	R	230 U	230 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.6 U	8.8 U	6.9 UJ	320 J	1.7 J	1300 UJ											

TABLE 5
SOIL ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location: Sample Depth: Sample Date: Sample Type:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																										
			Residential			Non-Residential			Groundwater			BH67-08 8-10 ft BGS	MW68-08 10-12 ft BGS	MW69-08 12-14 ft BGS	MW69-08 18-20 ft BGS	TMW-70-08 4-6 ft BGS	MW74-08 0-2 ft BGS	MW74-08 8-10 ft BGS	MW78-08 0-2 ft BGS	MW78-08 0-2 ft BGS	BH79-08 12-14 ft BGS	TMW-81-08 4-6 ft BGS	BH82-08 8-10 ft BGS	BH82-08 8-10 ft BGS	BH83-08 10-12 ft BGS	TMW87-08 7-9 ft BGS	BH97-12 12-14 ft BGS	BH97-12 18-20 ft BGS	
			Drinking Water	Drinking Water	Surface Water	03/10/2008	03/12/2008	03/12/2008	03/12/2008	03/05/2008	03/14/2008	03/14/2008	03/11/2008	03/11/2008	03/11/2008	03/05/2008	03/12/2008	03/12/2008	03/12/2008	03/12/2008	03/06/2008	08/21/2012	08/21/2012						
			Protection	Protection	Interface Protection											Duplicate				Duplicate									
Parameters	Units	a	a	b	c	d																							
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	8.6 U	8.8 U	6.9 UJ	270 U	9.7 U	160 U	280 U	13 U	14 U	92 J	0.63 J	7.4 U	8.0 U	11 U	9.9 U	100 U	100 U						
SVOCs																													
All SVOCs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE						
Metals																													
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	7900000	6190000	5720000	1930000	2740000	1600000	--	2930000	3450000	6920000	6070000	7610000	6990000	10400000	4140000	--	--						
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	71 J	72 J	70 J	42 J	R	170 UJ	--	98 J	81 J	57 J	47 J	92 J	80 J	140 J	51 J	--	--						
Arsenic	ug/kg	7020	9610	4600	4600	4600	4400 J	3800 J	3300 J	2200	4400 J	2700 J	--	5100	6400	5000	3800 J	4800 J	4700 J	5200 J	4200 J	--	--						
Barium	ug/kg	2400000	79700	1300000	1300000	G	56400	38700	28200	6400	19600	6900	--	17100	17400	39300	65600	47300	45800	83900	20400	--	--						
Beryllium	ug/kg	584	600	51000	51000	G	390	440 U	410 U	180 U	210	170 U	--	210	220	330	320	510	480 U	1100	210	--	--						
Cadmium	ug/kg	549	673	6000	6000	G,X	250	170 U	150 U	82 J	270	85 U	--	300	360	280	310	190 U	200 U	170 U	420	--	--						
Calcium	ug/kg	NA	NA	NA	NA	NA	88800000	63200000	77200000	53300000	72100000	39500000 J	--	45600000	37500000	75600000	101000000	83700000	74200000	2240000	93800000	--	--						
Chromium	ug/kg	NA	NA	NA	NA	NA	14800	10200	9700	5200	8000	3600 J	--	6500	7100	13700	12100	13000	12300	18400	13600	--	--						
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	14800	10200	9700	5200	7400	430 U	--	4700	5000	13200	12100	12000	12300	18400	13600	--	--						
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	900 U	900 U	890 U	910 U	680 J	4100 ^{ad}	--	1800	2100	470 J	890 U	1000	890 U	970 U	920 U	--	--						
Cobalt	ug/kg	NA	NA	NA	NA	NA	6600	6000	6200	2400	3300	2200	--	4300	4800	7400	4000	7800	7000	7200	5000	--	--						
Copper	ug/kg	NA	NA	NA	NA	NA	15900	17500	15500	8800	13500	5100 J	--	9600	12700	13700	11600	17500	17200	13400	15400	--	--						
Iron	ug/kg	NA	NA	NA	NA	NA	16000000	12400000	11800000	5300000	8640000	4370000	--	7900000	9870000	13500000	9780000	16100000	14500000	29300000 ^{abc}	10800000	--	--						
Lead	ug/kg	NA	NA	NA	NA	NA	6200	6400	5600	3000	4200	2900 J	--	5900	6700	6100	6400	6600	6500	9900	5400	--	--						
Lead - coarse fraction	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
Lead - fine fraction	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
Lead - total (calculated by fine/coarse fraction)	ug/kg	18200	27600	700000	700000	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA	14400000	9690000	15300000	11500000	10700000	7430000 J	--	11800000	11400000	19600000	16500000	14100000	12600000	2210000	12100000	--	--						
Manganese	ug/kg	4560000	677000	1000	1000	G, X	351000	331000	356000	151000	263000	138000	--	250000	228000	349000	222000	421000	391000	230000	365000 J	--	--						
Mercury	ug/kg	54.1	52 U	1700	1700	50 M	45 U	45 U	18 J	45 U	49 U	43 U	--	43 U	17 J	21 J	44 U	22 J	22 J	37 J	46 U	--	--						
Nickel	ug/kg	20000	31300	100000	100000	G	19500 J	15800	16300	5700	9900 J	5500 J	--	11200 J	13300 J	18000 J	11600 J	20800	19700	15400	13400	--	--						
Potassium	ug/kg	1280000	2660000	NA	NA	NA	1790000	1210000	1280000	392000 J	569000	239000 J	--	639000	683000	1320000	1280000	1540000	1460000	861000	727000	--	--						
Selenium	ug/kg	922	803	4000	4000	400	520 J	430 J	430 J	300	580 J	150 J	--	310	330	390	890 J	490 J	430 J	900 J	1400 J ^{ad}	--	--						
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M	19 J	90 U	26 J	91 U	2100 J ^{ad}	85 U	--	19 J	88 U	89 U	55 J	90 U	89 U	40 J	92 U	--	--						
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA	93800	106000	86600 J	87900 J	123000	85300 U	--	87000 U	87700 U	627000	323000	90000 U	78700 J	1850000	115000	--	--						
Thallium	ug/kg	190	432	2300	2300	4200 X	240	160	240	91 U	130	67 J	--	220	220	180	110	250	220	110 U	200	--	--						
Vanadium	ug/kg	30800	23800	72000	990000	430000	20400	14700	13800	7800	9100	6100 J	--	9900	10800	18400	14300	17400	16000	44600	12500	--	--						
Zinc	ug/kg	56300	64100	2400000	5000000	G	33400 J	33800 J	31900 J	19700	22000 J	17100	--	40900 J	90600 J	33400 J	20400 J	37400 J	35600 J	43100 J	29700	--	--						
PCBs																													
All PCBs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE						
General Chemistry																													
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	220 U	230 U	220 U	230 U	240 U	210 U	--	220 U	220 U	220 U	1200 ^{ad}	220 U	220 U	240 U	210 J	--	--						
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	13	12						
Total solids	%	NA	NA	NA	NA	NA	89.1	88.7	89.9	88.2	82.4	93.8	86.2	92.0	91.2	90.3	90.4	88.9	89.6	82.5	86.5	--	--						

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or impreci
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 6
GROUNDWATER ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)								MW32-07	MW48-07	MW48-07	MW63-08	MW63-08
Sample Date:									01/09/2008	04/08/2008	04/08/2008	04/07/2008	08/28/2012
Sample Type:	Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	Residential Groundwater Volatilization IndoorAir Inhalation	Non-Residential Groundwater Volatilization IndoorAir Inhalation	Groundwater Contact	Water Solubility				Duplicate		
Parameters	Units	a	b	c	d	e	f	g					
VOCs													
1,1,1-Trichloroethane	ug/L	200 A	200 A	89	660000	1300000 S	1300000 S	1330000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2,2-Tetrachloroethane	ug/L	8.5	35	78 X	12000	77000	4700	2970000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	5 A	5 A	330 X	17000	110000	21000	4420000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	880	2500	740	1000000	2300000	2400000	5060000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	7 A	7 A	130	200	1300	11000	2250000	0.47 J	0.65 J	0.68 J	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	70 A	70 A	99 X	300000 S	300000 S	19000	300000	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U
1,2,4-Trimethylbenzene	ug/L	63 E	63 E	17	56000 S	56000 S	56000 S	55890	1.0 U	1.0 U	1.0 U	1.0 U	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2 A	0.2 A	NA	220 S	1200 S	390	1230	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05 A	0.05 A	5.7 X	2400	15000	25	4200000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	600 A	600 A	13	160000 S	160000 S	160000 S	156000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	5 A	5 A	360 X	9600	59000	19000	8520000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	5 A	5 A	230 X	16000	36000	16000	2800000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3,5-Trimethylbenzene	ug/L	72 E	72 E	45	61000 S	61000 S	61000 S	61150	1.0 U	1.0 U	1.0 U	1.0 U	--
1,3-Dichlorobenzene	ug/L	6.6	19	28	18000	41000	2000	111000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	75 A	75 A	17	16000	74000 S	6400	73800	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	13000	38000	2200	240000000 S	240000000 S	240000000 S	240000000	25 U	25 U	0.74 J	25 U	25 U
2-Hexanone	ug/L	1000	2900	ID	4200000	8700000	5200000	16000000	50 U	50 U	50 U	50 U	50 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	1800	5200	ID	20000000 S	20000000 S	13000000	20000000	50 UJ	50 U	50 U	50 U	50 U
Chloroethane	ug/L	430	1700	1100 X	5700000 S	5700000 S	440000	5740000	1.0 U	1.0 U	1.0 UJ	1.0 UJ	5.0 U
Chloroform (Trichloromethane)	ug/L	80 A,W	80 A,W	350	28000	180000	150000	7920000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	260	1100	ID	8600	45000	490000	6340000	1.0 U	1.0 U	1.0 U	1.0 UJ	5.0 U
cis-1,2-Dichloroethene	ug/L	70 A	70 A	620	93000	210000	200000	3500000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Dibromochloromethane	ug/L	80 A,W	80 A,W	ID	14000	110000	18000	2600000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1700	4800	ID	220000	300000 S	300000 S	300000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Ethylbenzene	ug/L	74 E	74 E	18	110000	170000 S	170000 S	169000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Isopropyl benzene	ug/L	800	2300	28	56000 S	56000 S	56000 S	56000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methyl cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methyl tert butyl ether (MTBE)	ug/L	40 E	40 E	7100 X	47000000 S	47000000 S	610000	46800000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Methylene chloride	ug/L	5 A	5 A	1500 X	220000	1400000	220000	17000000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Styrene	ug/L	100 A	100 A	80	170000	310000 S	9700	310000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	5 A	5 A	60 X	25000	170000	12000	200000	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Toluene	ug/L	790 E	790 E	270	530000 S	530000 S	530000 S	526000	0.24 J	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	100 A	100 A	1500 X	85000	200000	220000	6300000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 UJ	1.0 U
Trichloroethene	ug/L	5 A	5 A	200 X	2200	4900	22000	1100000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	2600	7300	NA	1100000 S	1100000 S	1100000 S	1100000	0.22 J	1.0 U	1.0 U	1.0 UJ	1.0 U
Trifluorotrichloroethane (Freon 113)	ug/L	170000 S	170000 S	32	170000 S	170000 S	170000 S	170000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Vinyl chloride	ug/L	2 A	2 A	13 X	1100	13000	1000	2760000	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U
Xylenes (total)	ug/L	280 E	280 E	41	190000 S	190000 S	190000 S	186000	2.0 U	2.0 U	2.0 U	2.0 U	3.0 U

TABLE 6
GROUNDWATER ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)								MW32-07	MW48-07	MW48-07	MW63-08	MW63-08
Sample Date:									01/09/2008	04/08/2008	04/08/2008	04/07/2008	08/28/2012
Sample Type:	Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	Residential Groundwater Volatilization IndoorAir Inhalation	Non-Residential Groundwater Volatilization IndoorAir Inhalation	Groundwater Contact	Water Solubility				Duplicate		
Parameters	Units	a	b	c	d	e	f	g					
SVOCs													
2,4,5-Trichlorophenol	ug/L	730	2100	NA	NLV	NLV	170000	1200000	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	ug/L	120	470	5	NLV	NLV	10000	800000	4.0 U	4.0 U	4.0 U	4.0 U	5.0 U
2,4-Dichlorophenol	ug/L	73	210	11	NLV	NLV	48000	4500000	2.0 U	2.0 U	2.0 U	2.0 U	10 U
2-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
4-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Acenaphthene	ug/L	1300	3800	38	4200 S	4200 S	4200 S	4240	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Acenaphthylene	ug/L	52	150	ID	3900 S	3900 S	3900 S	3930	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Acetophenone	ug/L	1500	4400	NA	6100000 S	6100000 S	6100000 S	6100000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	ug/L	43 S	43 S	ID	43 S	43 S	43 S	43.4	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Atrazine	ug/L	3 A	3 A	7.3	NLV	NLV	5400	70000	1.0 U	1.0 U	1.0 U	1.0 U	10 U
Benzaldehyde	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	ug/L	2.1	8.5	ID	NLV	NLV	9.4 S,AA	9.4	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Benzo(a)pyrene	ug/L	5 A	5 A	ID	NLV	NLV	1 M,AA	1.62	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Benzo(b)fluoranthene	ug/L	1.5 S,AA	1.5 S,AA	ID	ID	ID	1.5 S,AA	1.5	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Benzo(g,h,i)perylene	ug/L	1 M	1 M	NA	NLV	NLV	1 M	0.26	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Benzo(k)fluoranthene	ug/L	1 M	1 M	NA	NLV	NLV	1 M,AA	0.8	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
bis(2-Chloroethyl)ether	ug/L	2	8.3	1 M	38000	210000	5700	17200000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6 A	6 A	25	NLV	NLV	320 AA	340	0.93 J	1.0 U	1.0 U	1.0 U	5.0 U
Butyl benzylphthalate (BBP)	ug/L	1200	2700 S	67 X	NLV	NLV	2700 S	2690	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Caprolactam	ug/L	5800	17000	NA	NLV	NLV	390000000	5250000000	5.0 U	5.0 UJ	5.0 UJ	5.0 UJ	10 U
Carbazole	ug/L	85	350	10 M	NLV	NLV	7400	7480	1.0 U	1.0 U	1.0 U	1.0 U	10 U
Chrysene	ug/L	1.6 S	1.6 S	ID	ID	ID	1.6 S,AA	1.6	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	NLV	NLV	400	3000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Fluoranthene	ug/L	210 S	210 S	1.6	210 S	210 S	210 S	206	0.20 U	0.24	0.20 U	0.20 U	5.0 U
Fluorene	ug/L	880	2000 S	12	2000 S	2000 S	2000 S	1980	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Hexachlorobenzene	ug/L	1 A	1 A	0.2 M	440	3000	4.6	6200	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Hexachlorobutadiene	ug/L	15	42	0.053	1600	3200 S	400	3230	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Hexachlorocyclopentadiene	ug/L	50 A	50 A	ID	130	420	1600	1800	5.0 U	5.0 U	5.0 U	5.0 U	20 U
Hexachloroethane	ug/L	7.3	21	6.7 X	27000	50000 S	1900	50000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Indeno(1,2,3-cd)pyrene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	0.022	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Isophorone	ug/L	770	3100	1300 X	NLV	NLV	990000	12000000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Naphthalene	ug/L	520	1500	11	31000 S	31000 S	31000 S	31000	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Nitrobenzene	ug/L	3.4	9.6	180 X	280000	550000	11000	2090000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Pentachlorophenol	ug/L	1 A	1 A	G,X	NLV	NLV	200	1850000	5.0 U	5.0 U	5.0 U	5.0 U	20 U
Phenanthrene	ug/L	52	150	2 M	1000 S	1000 S	1000 S	1000	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Phenol	ug/L	4400	13000	450	NLV	NLV	29000000	82800000	1.0 U	1.0 U	1.0 U	1.0 U	5.0 U
Pyrene	ug/L	140 S	140 S	ID	140 S	140 S	140 S	135	0.20 U	0.20 U	0.20 U	0.20 U	5.0 U
Pyridine	ug/L	20 M	21	NA	5500	12000	94000	300000	1.0 U	1.0 U	1.0 U	1.0 U	--

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Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)								MW32-07	MW48-07	MW48-07	MW63-08	MW63-08
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Sample Type:		Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	Residential Groundwater Volatilization IndoorAir Inhalation	Non-Residential Groundwater Volatilization IndoorAir Inhalation	Groundwater Contact	Water Solubility			Duplicate		
Parameters	Units	a	b	c	d	e	f	g					
Metals													
Aluminum	ug/L	50 V	50 V	NA	NLV	NLV	64000000	NA	325 ^{ab}	22.5 J	26.2 J	172 ^{ab}	--
Antimony	ug/L	6 A	6 A	130 X	NLV	NLV	68000	NA	1.7 J	2.0 U	2.0 U	0.17 J	--
Arsenic	ug/L	10 A	10 A	10	NLV	NLV	4300	NA	5.0 U	5.0 U	5.0 U	5.0 U	--
Barium	ug/L	2000 A	2000 A	G	NLV	NLV	14000000	NA	8.1 J	299	293	111	--
Beryllium	ug/L	4 A	4 A	G	NLV	NLV	290000	NA	1.0 U	1.0 U	1.0 U	1.0 U	--
Cadmium	ug/L	5 A	5 A	G,X	NLV	NLV	190000	NA	1.0 U	1.0 U	1.0 U	1.0 U	--
Calcium	ug/L	NA	NA	NA	NA	NA	NA	NA	22500	143000	142000	141000	--
Chromium	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	7.6	5.0 U	5.0 U	5.0 U	--
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	NLV	NLV	290000000	NA	7.6 J	5 U	5 U	5 U	--
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	10 UJ	10 U	10 U	10 U	--
Cobalt	ug/L	40	100	100	NLV	NLV	2400000	NA	7.0 U	7.0 U	7.0 U	7.0 U	--
Copper	ug/L	1000 E	1000 E	G	NLV	NLV	7400000	NA	2.4 U	2.0 U	2.0 U	2.0 U	--
Iron	ug/L	300 E	300 E	NA	NLV	NLV	58000000	NA	783 ^{ab}	7670 ^{ab}	7880 ^{ab}	539 ^{ab}	--
Lead	ug/L	4 L	4 L	G,X	NLV	NLV	ID	NA	3.0 U	3.0 U	3.0 U	22.5 ^{ab}	--
Magnesium	ug/L	400000	1100000	NA	NLV	NLV	1000000000 D	NA	3590	33500	33000	32100	--
Manganese	ug/L	50 E	50 E	G,X	NLV	NLV	9100000	NA	10.8 J	324 ^{ab}	323 ^{ab}	595 ^{ab}	--
Mercury	ug/L	2 A	2 A	0.0013	56 S	56 S	56 S	56	0.20 U	0.20 U	0.20 U	0.20 U	--
Nickel	ug/L	100 A	100 A	G	NLV	NLV	74000000	NA	20.0 U	20.0 U	20.0 U	20.0 U	--
Potassium	ug/L	NA	NA	NA	NA	NA	NA	NA	2460	6790 J	6700 J	4550 J	--
Selenium	ug/L	50 A	50 A	5	NLV	NLV	970000	NA	5.0 U	5.0 U	5.0 U	5.0 U	--
Silver	ug/L	34	98	0.2 M	NLV	NLV	1500000	NA	0.20 U	0.20 U	0.20 U	0.20 U	--
Sodium	ug/L	120000	350000	NA	NLV	NLV	1000000000 D	NA	66800	730000 ^{ab}	716000 ^{ab}	365000 ^{ab}	--
Thallium	ug/L	2 A	2 A	3.7 X	NLV	NLV	13000	NA	1.0 U	1.0 U	1.0 U	1.0 U	--
Vanadium	ug/L	4.5	62	27	NLV	NLV	970000	NA	3.3 J	4.0 U	4.0 U	4.0 U	--
Zinc	ug/L	2400	5000 E	G	NLV	NLV	110000000	NA	20.0 U	20.0 U	20.0 U	7.2 J	--
PCBs													
All PCBs	ug/L	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE
General Chemistry													
Cyanide (amenable)	ug/L	200 A	200 A	NA	NLV	NLV	57000	NA	5 U	5 U	5 U	20	--
Field Parameters													
Conductivity, field	umhos/cm	NA	NA	NA	NA	NA	NA	NA	--	4.8	4.8	3.52	--
Dissolved oxygen (DO), field	ug/L	NA	NA	NA	NA	NA	NA	NA	--	1170	1170	12660	--
Oxidation reduction potential (ORP), field	millivolts	NA	NA	NA	NA	NA	NA	NA	--	-158	-158	187	--
pH, field	s.u.	6.5 - 8.5 E	6.5 - 8.5 E	NA	NA	NA	NA	NA	--	7.14	7.14	6.69	--
Temperature, ambient	Deg F	NA	NA	NA	NA	NA	NA	NA	--	50	50	50	--
Temperature, field	Deg C	NA	NA	NA	NA	NA	NA	NA	--	10	10	12.8	--
Turbidity, field	NTU	NA	NA	NA	NA	NA	NA	NA	--	3.87	3.87	37.3	--

Notes:
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 6
GROUNDWATER ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:		Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)							MW64-08	MW64-08	MW68-08	MW68-08	MW74-08	MW74-08	MW78-08	TMW-81-08
Sample Date:				Groundwater	Residential Groundwater	Non-Residential		04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	03/10/2008	
Sample Type:		Residential	Non-Residential	Surface Water	Volatilization	Groundwater Volatilization	Groundwater									
		Drinking Water	Drinking Water	Interface	IndoorAir Inhalation	IndoorAir Inhalation	Contact									
Parameters	Units	a	b	c	d	e	f	g								
VOCs																
1,1,1-Trichloroethane	ug/L	200 A	200 A	89	660000	1300000 S	1300000 S	1330000	1.0 U	1.0 U	1.0 U	1.0 U	1000 ^{abc}	750 ^{abc}	1.0 U	4.0 U
1,1,2,2-Tetrachloroethane	ug/L	8.5	35	78 X	12000	77000	4700	2970000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 UJ
1,1,2-Trichloroethane	ug/L	5 A	5 A	330 X	17000	110000	21000	4420000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,1-Dichloroethane	ug/L	880	2500	740	1000000	2300000	2400000	5060000	1.0 U	1.0 U	1.0 U	1.0 U	230	54	1.0 U	4.0 U
1,1-Dichloroethene	ug/L	7 A	7 A	130	200	1300	11000	2250000	1.0 U	1.0 U	1.0 U	1.0 U	57 J ^{ab}	18 ^{ab}	1.0 U	4.0 U
1,2,4-Trichlorobenzene	ug/L	70 A	70 A	99 X	300000 S	300000 S	19000	300000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	20 U
1,2,4-Trimethylbenzene	ug/L	63 E	63 E	17	56000 S	56000 S	56000 S	55890	1.0 U	--	1.0 U	--	77 U	--	1.0 U	4.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2 A	0.2 A	NA	220 S	1200 S	390	1230	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05 A	0.05 A	5.7 X	2400	15000	25	4200000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,2-Dichlorobenzene	ug/L	600 A	600 A	13	160000 S	160000 S	160000 S	156000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,2-Dichloroethane	ug/L	5 A	5 A	360 X	9600	59000	19000	8520000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,2-Dichloropropane	ug/L	5 A	5 A	230 X	16000	36000	16000	2800000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,3,5-Trimethylbenzene	ug/L	72 E	72 E	45	61000 S	61000 S	61000 S	61150	1.0 U	--	1.0 U	--	77 U	--	1.0 U	4.0 U
1,3-Dichlorobenzene	ug/L	6.6	19	28	18000	41000	2000	111000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
1,4-Dichlorobenzene	ug/L	75 A	75 A	17	16000	74000 S	6400	73800	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	13000	38000	2200	240000000 S	240000000 S	240000000 S	240000000	25 U	25 U	25 U	25 U	1900 U	120 U	25 U	36 J
2-Hexanone	ug/L	1000	2900	ID	4200000	8700000	5200000	16000000	50 U	50 U	50 U	50 U	3800 U	250 U	50 U	3.8 J
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	1800	5200	ID	20000000 S	20000000 S	13000000	20000000	0.79 J	50 U	50 U	50 U	3800 U	250 U	50 U	7.6 J
Chloroethane	ug/L	430	1700	1100 X	5700000 S	5700000 S	440000	5740000	1.0 UJ	5.0 U	1.0 UJ	5.0 U	77 UJ	25 U	1.0 UJ	4.0 U
Chloroform (Trichloromethane)	ug/L	80 A,W	80 A,W	350	28000	180000	150000	7920000	1.0 U	1.0 U	0.23 J	1.0 U	17 J	7.2	1.0 U	4.0 U
Chloromethane (Methyl chloride)	ug/L	260	1100	ID	8600	45000	490000	6340000	1.0 UJ	5.0 U	1.0 UJ	5.0 U	77 UJ	25 U	1.0 UJ	4.0 UJ
cis-1,2-Dichloroethene	ug/L	70 A	70 A	620	93000	210000	200000	3500000	1.0 U	1.0 U	1.0 U	1.0 U	76 J ^{ab}	26	1.0 U	4.0 U
cis-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 UJ	4.0 U
Cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Dibromochloromethane	ug/L	80 A,W	80 A,W	ID	14000	110000	18000	2600000	1.0 U	5.0 U	1.0 U	5.0 U	77 U	25 U	1.0 U	4.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1700	4800	ID	220000	300000 S	300000 S	300000	1.0 U	5.0 U	1.0 U	5.0 U	77 U	25 U	1.0 U	4.0 U
Ethylbenzene	ug/L	74 E	74 E	18	110000	170000 S	170000 S	169000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Isopropyl benzene	ug/L	800	2300	28	56000 S	56000 S	56000 S	56000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	20 U
Methyl cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Methyl tert butyl ether (MTBE)	ug/L	40 E	40 E	7100 X	47000000 S	47000000 S	610000	46800000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	20 U
Methylene chloride	ug/L	5 A	5 A	1500 X	220000	1400000	220000	17000000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	20 U
Styrene	ug/L	100 A	100 A	80	170000	310000 S	9700	310000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Tetrachloroethene	ug/L	5 A	5 A	60 X	25000	170000	12000	200000	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 UJ	4.0 U
Toluene	ug/L	790 E	790 E	270	530000 S	530000 S	530000 S	526000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
trans-1,2-Dichloroethene	ug/L	100 A	100 A	1500 X	85000	200000	220000	6300000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
trans-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 UJ	4.0 U
Trichloroethene	ug/L	5 A	5 A	200 X	2200	4900	22000	1100000	1.0 U	1.0 U	1.0 U	1.0 U	2100 ^{abc}	2100 ^{abc}	1.0 U	4.0 U
Trichlorofluoromethane (CFC-11)	ug/L	2600	7300	NA	1100000 S	1100000 S	1100000 S	1100000	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 UJ	4.0 U
Trifluorotrichloroethane (Freon 113)	ug/L	170000 S	170000 S	32	170000 S	170000 S	170000 S	170000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Vinyl chloride	ug/L	2 A	2 A	13 X	1100	13000	1000	2760000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	4.0 U
Xylenes (total)	ug/L	280 E	280 E	41	190000 S	190000 S	190000 S	186000	2.0 U	3.0 U	2.0 U	3.0 U	150 U	15 U	2.0 U	8.0 U

TABLE 6
GROUNDWATER ANALYTICAL RESULTS
AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)								MW64-08	MW64-08	MW68-08	MW68-08	MW74-08	MW74-08	MW78-08	TMW-81-08
Sample Date:									04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	03/10/2008
Sample Type:	Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	Residential Groundwater Volatilization IndoorAir Inhalation	Non-Residential Groundwater Volatilization IndoorAir Inhalation	Groundwater Contact	Water Solubility									
Parameters	Units	a	b	c	d	e	f	g								
SVOCs																
2,4,5-Trichlorophenol	ug/L	730	2100	NA	NLV	NLV	170000	1200000	5.0 U	5.0 U	5.0 U	5.0 U	9.0 U	5.0 U	5.0 U	--
2,4,6-Trichlorophenol	ug/L	120	470	5	NLV	NLV	10000	800000	4.0 U	5.0 U	4.0 U	5.0 U	7.2 U	5.0 U	4.0 U	--
2,4-Dichlorophenol	ug/L	73	210	11	NLV	NLV	48000	4500000	2.0 U	10 U	2.0 U	10 U	3.6 U	10 U	2.0 U	--
2-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
4-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Acenaphthene	ug/L	1300	3800	38	4200 S	4200 S	4200 S	4240	0.20 U	5.0 U	0.20 U	5.0 U	0.66	5.0 U	0.20 U	--
Acenaphthylene	ug/L	52	150	ID	3900 S	3900 S	3900 S	3930	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	0.20 U	--
Acetophenone	ug/L	1500	4400	NA	6100000 S	6100000 S	6100000 S	6100000	1.0 U	1.0 U	1.0 U	1.0 U	1.8 U	1.0 U	1.0 U	--
Anthracene	ug/L	43 S	43 S	ID	43 S	43 S	43 S	43.4	0.20 U	5.0 U	0.20 U	5.0 U	1.3	5.0 U	0.20 U	--
Atrazine	ug/L	3 A	3 A	7.3	NLV	NLV	5400	70000	1.0 U	10 U	1.0 U	10 U	1.8 U	10 U	1.0 U	--
Benzaldehyde	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.8 U	1.0 U	1.0 U	--
Benzo(a)anthracene	ug/L	2.1	8.5	ID	NLV	NLV	9.4 S,AA	9.4	0.20 U	5.0 U	0.35	5.0 U	3.4 ^a	5.0 U	0.20 U	--
Benzo(a)pyrene	ug/L	5 A	5 A	ID	NLV	NLV	1 M,AA	1.62	0.20 U	5.0 U	0.30	5.0 U	3.3 ^{fg}	5.0 U	0.20 U	--
Benzo(b)fluoranthene	ug/L	1.5 S,AA	1.5 S,AA	ID	ID	ID	1.5 S,AA	1.5	0.20 U	5.0 U	0.35	5.0 U	4.1 ^{abfg}	5.0 U	0.20 U	--
Benzo(g,h,i)perylene	ug/L	1 M	1 M	NA	NLV	NLV	1 M	0.26	0.20 U	5.0 U	0.20 U	5.0 U	2.2 ^{abfg}	5.0 U	0.20 U	--
Benzo(k)fluoranthene	ug/L	1 M	1 M	NA	NLV	NLV	1 M,AA	0.8	0.20 U	5.0 U	0.20 U	5.0 U	1.7 ^{abfg}	5.0 U	0.20 U	--
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
bis(2-Chloroethyl)ether	ug/L	2	8.3	1 M	38000	210000	5700	17200000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6 A	6 A	25	NLV	NLV	320 AA	340	1.0 U	5.0 U	0.97 J	5.0 U	0.90 J	5.0 U	1.0 U	--
Butyl benzylphthalate (BBP)	ug/L	1200	2700 S	67 X	NLV	NLV	2700 S	2690	1.0 U	5.0 U	1.0 U	0.60 J	1.8 U	5.0 U	1.0 U	--
Caprolactam	ug/L	5800	17000	NA	NLV	NLV	390000000	5250000000	5.0 UJ	10 U	5.0 UJ	10 U	9.0 UJ	10 U	5.0 UJ	--
Carbazole	ug/L	85	350	10 M	NLV	NLV	7400	7480	1.0 U	10 U	1.0 U	10 U	0.97 J	10 U	1.0 U	--
Chrysene	ug/L	1.6 S	1.6 S	ID	ID	ID	1.6 S,AA	1.6	0.20 U	5.0 U	0.32	5.0 U	3.3 ^{abfg}	5.0 U	0.20 U	--
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	NLV	NLV	400	3000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Fluoranthene	ug/L	210 S	210 S	1.6	210 S	210 S	210 S	206	0.20 U	5.0 U	0.74	5.0 U	8.4 ^c	5.0 U	0.20 U	--
Fluorene	ug/L	880	2000 S	12	2000 S	2000 S	2000 S	1980	0.20 U	5.0 U	0.20 U	5.0 U	0.72	5.0 U	0.20 U	--
Hexachlorobenzene	ug/L	1 A	1 A	0.2 M	440	3000	4.6	6200	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	0.20 U	--
Hexachlorobutadiene	ug/L	15	42	0.053	1600	3200 S	400	3230	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Hexachlorocyclopentadiene	ug/L	50 A	50 A	ID	130	420	1600	1800	5.0 U	20 U	5.0 U	20 U	9.0 U	20 U	5.0 U	--
Hexachloroethane	ug/L	7.3	21	6.7 X	27000	50000 S	1900	50000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Indeno(1,2,3-cd)pyrene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	0.022	0.20 U	5.0 U	0.20 U	5.0 U	2.0 ^g	5.0 U	0.20 U	--
Isophorone	ug/L	770	3100	1300 X	NLV	NLV	990000	12000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Naphthalene	ug/L	520	1500	11	31000 S	31000 S	31000 S	31000	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	0.20 U	--
Nitrobenzene	ug/L	3.4	9.6	180 X	280000	550000	11000	2090000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Pentachlorophenol	ug/L	1 A	1 A	G,X	NLV	NLV	200	1850000	5.0 U	20 U	5.0 U	20 U	9.0 U	20 U	5.0 U	--
Phenanthrene	ug/L	52	150	2 M	1000 S	1000 S	1000 S	1000	0.20 U	5.0 U	0.59	5.0 U	5.8 ^c	5.0 U	0.20 U	--
Phenol	ug/L	4400	13000	450	NLV	NLV	29000000	82800000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	1.0 U	--
Pyrene	ug/L	140 S	140 S	ID	140 S	140 S	140 S	135	0.20 U	5.0 U	0.59	5.0 U	6.3	5.0 U	0.20 U	--
Pyridine	ug/L	20 M	21	NA	5500	12000	94000	300000	1.0 U	--	1.0 U	--	1.8 U	--	1.0 U	--

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AOI 2 - HISTORICAL OPERATIONS - FORMER PLANTS 3, 4, AND 5
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)								MW64-08	MW64-08	MW68-08	MW68-08	MW74-08	MW74-08	MW78-08	TMW-81-08
Sample Date:									04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	03/10/2008
Sample Type:	Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface	Residential Groundwater Volatilization IndoorAir Inhalation	Non-Residential Groundwater Volatilization IndoorAir Inhalation	Groundwater Contact	Water Solubility									
Parameters	Units	a	b	c	d	e	f	g								
Metals																
Aluminum	ug/L	50 V	50 V	NA	NLV	NLV	64000000	NA	157 ^{ab}	--	467 ^{ab}	--	459 ^{ab}	--	92.8 ^{ab}	--
Antimony	ug/L	6 A	6 A	130 X	NLV	NLV	68000	NA	0.78 J	--	0.30 J	--	0.51 J	--	0.39 J	--
Arsenic	ug/L	10 A	10 A	10	NLV	NLV	4300	NA	5.0 U	--	5.0 U	--	5.0 U	--	5.0 U	--
Barium	ug/L	2000 A	2000 A	G	NLV	NLV	14000000	NA	46.7 J	--	23.4 J	--	90.8 J	--	43.5 J	--
Beryllium	ug/L	4 A	4 A	G	NLV	NLV	290000	NA	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Cadmium	ug/L	5 A	5 A	G,X	NLV	NLV	190000	NA	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Calcium	ug/L	NA	NA	NA	NA	NA	NA	NA	73200	--	73200	--	118000	--	164000	--
Chromium	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	3.3 J	--	2.4 J	--	2.4 J	--	5.0 U	--
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	NLV	NLV	290000000	NA	5 U	--	5 U	--	5 U	--	5 U	--
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	10 U	--	10 U	--	10 U	--	10 U	--
Cobalt	ug/L	40	100	100	NLV	NLV	2400000	NA	7.0 U	--	7.0 U	--	13.3	--	7.0 U	--
Copper	ug/L	1000 E	1000 E	G	NLV	NLV	7400000	NA	2.3 U	--	2.0 U	--	4.1	--	2.0 U	--
Iron	ug/L	300 E	300 E	NA	NLV	NLV	58000000	NA	1080 ^{ab}	--	711 ^{ab}	--	1250 ^{ab}	--	166	--
Lead	ug/L	4 L	4 L	G,X	NLV	NLV	ID	NA	3.0 U	--	3.0 U	--	3.0 U	--	2.5 J	--
Magnesium	ug/L	400000	1100000	NA	NLV	NLV	1000000000 D	NA	24500	--	19200	--	29800	--	56400	--
Manganese	ug/L	50 E	50 E	G,X	NLV	NLV	9100000	NA	91.7 ^{ab}	--	23.1	--	475 ^{ab}	--	238 ^{ab}	--
Mercury	ug/L	2 A	2 A	0.0013	56 S	56 S	56 S	56	0.12 J ^c	--	0.20 U	--	0.20 U	--	0.12 J ^c	--
Nickel	ug/L	100 A	100 A	G	NLV	NLV	74000000	NA	20.0 U	--	20.0 U	--	8.6 J	--	20.0 U	--
Potassium	ug/L	NA	NA	NA	NA	NA	NA	NA	5320 J	--	2240 J	--	5990 J	--	22800 J	--
Selenium	ug/L	50 A	50 A	5	NLV	NLV	970000	NA	5.4 ^c	--	4.5 J	--	5.0 U	--	5.0 U	--
Silver	ug/L	34	98	0.2 M	NLV	NLV	1500000	NA	0.20 U	--	0.20 U	--	0.20 U	--	0.20 U	--
Sodium	ug/L	120000	350000	NA	NLV	NLV	1000000000 D	NA	165000 ^a	--	124000 ^a	--	593000 ^{ab}	--	44400	--
Thallium	ug/L	2 A	2 A	3.7 X	NLV	NLV	13000	NA	1.0 U	--	1.0 U	--	1.0 U	--	1.0 U	--
Vanadium	ug/L	4.5	62	27	NLV	NLV	970000	NA	2.1 J	--	1.0 J	--	4.0 U	--	4.0 U	--
Zinc	ug/L	2400	5000 E	G	NLV	NLV	110000000	NA	20.0 U	--	20.0 U	--	31.4	--	20.0 U	--
PCBs																
All PCBs	ug/L	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																
Cyanide (amenable)	ug/L	200 A	200 A	NA	NLV	NLV	57000	NA	5 U	--	5 U	--	14	--	5 U	--
Field Parameters																
Conductivity, field	umhos/cm	NA	NA	NA	NA	NA	NA	NA	1.22	--	1.24	--	4.08	--	1.77	--
Dissolved oxygen (DO), field	ug/L	NA	NA	NA	NA	NA	NA	NA	9130	--	10750	--	12920	--	14050	--
Oxidation reduction potential (ORP), field	millivolts	NA	NA	NA	NA	NA	NA	NA	163	--	53	--	-27	--	122	--
pH, field	s.u.	6.5 - 8.5 E	6.5 - 8.5 E	NA	NA	NA	NA	NA	5.93 ^{ab}	--	7.64	--	7.71	--	6.86	--
Temperature, ambient	Deg F	NA	NA	NA	NA	NA	NA	NA	50	--	50	--	50	--	50	--
Temperature, field	Deg C	NA	NA	NA	NA	NA	NA	NA	13.8	--	15.6	--	15.5	--	15.2	--
Turbidity, field	NTU	NA	NA	NA	NA	NA	NA	NA	39.5	--	20.9	--	40.9	--	6.04	--

Notes:
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 7																			
SOIL ANALYTICAL RESULTS																			
AOI 5 - USTs - PLANT 3																			
PCC - VALIDATION																			
PONTIAC, MICHIGAN																			
Sample Location: Sample Depth: Sample Date: Sample Type:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾					MW33-07	MW33-07	MW33-07	MW34-07	BH36-07	BH36-07	BH36-07	MW37-07	MW40-07	MW43-07	BH89-08	BH90-08
			Residential	Non-Residential	Groundwater	Residential	0-2 ft BGS	16-18 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	13.5-15.5 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	10.5-12.5 ft BGS	7-9 ft BGS
			Drinking Water	Drinking Water	Surface Water	Direct Contact	12/03/2007	12/03/2007	12/03/2007	12/04/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/05/2007	12/06/2007	03/13/2008	03/13/2008
			Protection	Protection	Interface Protection														
Parameters	Units	a	a	b	c	d	p												
VOCs																			
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	460000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	53000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 U	3.9 U	3.4 U	4.1 U
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	180000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	890000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	200000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	990000 DD	R	480 U	46 U	4.1 U	4.4 UJ	R	R	220 U	5.1 U	3.9 U	3.4 U	4.1 U
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	110000 C	4.2 J	2500 J ^{bcd}	46 U	4.1 U	0.85 J	R	R	89 U	5.1 U	3.9 U	3.4 U	4.1 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	1200 C	R	480 U	92 U	8.1 U	8.8 U	R	R	220 U	10 U	7.9 U	6.8 U	8.2 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	92	R	480 U	46 U	4.1 U	4.4 U	R	R	220 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	210000 C	R	190 U	46 U	4.1 U	4.4 U	R	R	89 U	5.1 U	3.9 U	3.4 U	4.1 U
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	91000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	140000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	94000 C	4.9 UJ	450 J	46 U	4.1 U	4.4 U	R	R	89 U	5.1 U	3.9 U	3.4 U	4.1 U
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	170000 C	R	190 U	46 U	4.1 U	4.4 U	R	R	89 U	5.1 U	3.9 U	3.4 U	4.1 U
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	400000	R	190 U	46 U	4.1 U	4.4 U	R	R	89 U	5.1 U	3.9 U	3.4 U	4.1 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	27000000 C,DD	R	1400 U	460 U	5.2 J	18 U	R	R	670 U	1.8 J	2.6 J	14 U	1.5 J
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	2500000 C	R	4800 U	460 U	16 U	18 U	R	R	2200 U	21 UJ	16 U	14 U	16 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	2700000 C	R	4800 U	460 U	16 U	18 U	R	R	18 J	21 UJ	16 U	14 U	16 U
Acetone	ug/kg	NA	NA	15000	42000	34000	23000000	55 J	1400 U	460 U	28 U	18 U	R	R	670 U	21 UJ	13 J	14 U	7.7 J
Benzene	ug/kg	NA	NA	100	100	4000 X	180000	0.62 J	95 U	46 U	0.36 J	4.4 U	R	R	9.8 J	5.1 UJ	3.9 U	3.4 U	4.1 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	110000	R	190 U	46 U	4.1 U	4.4 U	R	R	89 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	820000	R	190 U	92 U	4.1 U	4.4 U	R	R	89 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	320000	R	480 U	92 U	4.1 U	4.4 U	R	R	220 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	280000 C,DD	R	480 U	46 U	2.4 J	4.4 U	R	R	220 U	5.1 UJ	3.9 U	3.4 U	1.2 J
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	96000	R	95 UJ	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	260000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	950000 C	R	480 U	92 U	4.1 UJ	4.4 UJ	R	R	220 U	5.1 UJ	0.82 J	3.4 U	4.1 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	1200000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	1100000 C	R	480 U	92 U	4.1 U	4.4 U	R	R	220 U	5.1 UJ	3.9 U	3.4 U	4.1 U
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	640000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	1000000 C	R	190 UJ	92 U	4.1 U	4.4 U	R	R	89 UJ	5.1 UJ	3.9 U	3.4 U	4.1 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	140000 C	3.2 J	300 J	46 U	4.1 U	4.4 U	R	R	14 J	5.1 UJ	3.9 U	3.4 U	4.1 U
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	390000 C	0.91 J	610 J	46 U	4.1 U	4.4 U	R	R	6.0 J	5.1 UJ	3.9 U	3.4 U	4.1 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	R	480 U	180 U	16 U	18 U	R	R	220 U	21 UJ	16 U	14 U	16 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	R	R	180 U	4.1 U	4.4 U	R	R	R	5.1 UJ	3.9 U	3.4 U	4.1 U
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	2.6 J	190 U	46 U	0.51 J	0.30 J	R	R	42 J	5.1 UJ	3.9 U	3.4 U	4.1 U
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	NA	R	95 U	46 U	4.1 U	4.4 U	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Trichloroethene	ug/kg	NA	NA	100	100	4000 X	500000 C,DD	1.1 J	95 U	46 U	4.1 U	0.80 J	R	R	45 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Trichlorofluoromethane (CFC-11)	ug/kg	NA	NA	52000	150000	NA	560000 C	R	190 U	92 UJ	4.1 U	4.4 U	R	R	89 U	5.1 UJ	3.9 UJ	3.4 U	4.1 U
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	NA	550000 C	550000 C	1700	550000 C	R	480 U	92 UJ	4.1 U	4.4 U	R	R	220 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Vinyl chloride	ug/kg	NA	NA	40	40	260 X	3800	R	76 U	37 U	4.1 U	4.4 U	R	R	36 U	5.1 UJ	3.9 U	3.4 U	4.1 U
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	150000 C	19 J	300 J	92 U	0.59 J	0.73 J	R	R	82 J	10 UJ	7.9 U	6.8 U	8.2 U

TABLE 7																			
SOIL ANALYTICAL RESULTS																			
AOI 5 - USTs - PLANT 3																			
PCC - VALIDATION																			
PONTIAC, MICHIGAN																			
Sample Location: Sample Depth: Sample Date: Sample Type:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾					MW33-07	MW33-07	MW33-07	MW34-07	BH36-07	BH36-07	BH36-07	MW37-07	MW40-07	MW43-07	BH89-08	BH90-08
			Residential	Non-Residential	Groundwater	Residential	0-2 ft BGS	16-18 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	13.5-15.5 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	10.5-12.5 ft BGS	7-9 ft BGS
			Drinking Water Protection	Drinking Water Protection	Surface Water	Direct Contact	12/03/2007	12/03/2007	12/03/2007	12/04/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/05/2007	12/06/2007	03/13/2008	03/13/2008
			Background Value(2)	Background Value(2)	Interface Protection														
Parameters	Units	a	a	b	c	d	p												
SVOCs																			
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	23000000	R	1800 U	170 UJ	170 U	1600 U	170 UJ	170 UJ	1700 U	170 U	170 U	170 U	170 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	R	1800 U	170 UJ	170 U	1600 U	170 UJ	170 UJ	1700 U	170 U	170 U	170 U	170 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	R	1800 U	170 UJ	170 U	1600 U	170 UJ	170 UJ	1700 U	170 U	170 U	170 U	170 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	R	1800 U	170 UJ	170 U	1600 U	170 UJ	170 UJ	1700 U	170 U	170 U	170 U	170 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	69	79 U	7.6 U	220	70 U	7.6 UJ	7.6 UJ	74 U	7.6 U	7.7	7.5 U	7.6 U
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	R	2400 U	230 UJ	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	450 UJ	2400 U	230 U	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	630000	R	590 U	57 UJ	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	6600	220 UJ	1200 U	110 U	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	450 UJ	2400 U	230 U	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
4-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	R	2400 U	230 UJ	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	450 UJ	2400 U	230 U	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	R	3900 U	380 UJ	380 U	3500 U	380 UJ	370 UJ	3700 U	380 U	370 U	370 U	380 U
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	41000000	100	79 U	7.6 U	7.8 U	210	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	1600000	25	79 U	7.6 U	7.8 U	470	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Acetophenone	ug/kg	NA	NA	30000	88000	ID	1100000 C	220 UJ	1200 U	110 UJ	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	230	79 U	7.6 U	7.8 U	820	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	450 UJ	2400 U	230 U	230 U	2100 U	230 UJ	230 UJ	2200 U	230 U	220 U	230 U	230 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	220 UJ	1200 U	110 U	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	490	79 U	7.6 U	15	3700	7.6 UJ	7.6 UJ	160	7.6 U	23	7.5 U	7.6 U
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	430	79 U	7.6 U	12	2600 ^P	7.6 UJ	7.6 UJ	120	7.6 U	24	7.5 U	7.6 U
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	610	79 U	7.6 U	13	3600	7.6 UJ	7.6 UJ	250	7.6 U	37	7.5 U	7.6 U
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	320	79 U	7.6 U	12	1500	7.6 UJ	7.6 UJ	74 U	7.6 U	25	14	7.6 U
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	240	79 U	7.6 U	7.8 U	1300	7.6 UJ	7.6 UJ	74 U	7.6 U	11	7.5 U	7.6 U
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	110 UJ	590 U	57 U	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	220 UJ	1200 U	110 U	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
bis(2-Chloroethyl)ether	ug/kg	NA	NA	100	170	100 M	13000	220 UJ	1200 U	110 UJ	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	NA	NA	NLL	NLL	NLL	2800000	61 J	590 U	21 J	110 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	25 J	57 U
Butyl benzylphthalate (BBP)	ug/kg	NA	NA	310000 C	310000 C	120000 X	310000 C	110 UJ	590 U	57 U	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Caprolactam	ug/kg	NA	NA	120000	340000	NA	53000000 DD	740 UJ	3900 U	380 U	380 U	3500 U	380 UJ	370 UJ	3700 U	380 U	370 U	370 U	380 U
Carbazole	ug/kg	NA	NA	9400	39000	1100	530000	93 J	590 U	57 U	58 U	200 J	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL	2000000	550	79 U	7.6 U	23	2900	7.6 UJ	7.6 UJ	170	7.6 U	35	7.5 U	7.6 U
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	2000	96	79 U	7.6 U	7.8 U	430	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	ID	82 J	590 U	57 U	51 J	220 J	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	1400	79 U	7.6 U	23	10000 ^d	7.6 UJ	7.6 UJ	370	7.6 U	55	25	7.6 U
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	60	79 U	7.6 U	7.8 U	280	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	15 UJ	79 U	7.6 U	7.8 U	70 U	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	110 UJ	590 U	57 UJ	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	270	79 U	7.6 U	7.8 U	1400	7.6 UJ	7.6 UJ	74 U	7.6 U	15	7.5 U	7.6 U
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	110 UJ	590 U	57 U	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	64	79 U	7.6 U	160	79	7.6 UJ	7.6 UJ	74 U	7.6 U	7.5 U	7.5 U	7.6 U
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	220 UJ	1200 U	110 U	120 U	1100 U	110 UJ	110 UJ	1100 U	110 U	110 U	110 U	110 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	R	1800 U	170 UJ	170 U	1600 U	170 UJ	170 UJ	1700 U	170 U	170 U	170 U	170 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	910	96	7.6 U	99	3400 ^d	7.6 UJ	7.6 UJ	190	8.9	30	34	7.6 U
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	R	590 U	57 UJ	58 U	530 U	57 UJ	57 UJ	560 U	57 U	56 U	57 U	57 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	1100	79 U	7.6 U	28	8100	7.6 UJ	7.6 UJ	320	7.6 U	41	25	7.6 U
Pyridine	ug/kg	NA	NA	400	420	NA	37000 C	220 UJ	1200 U	110 UJ	120 U	1100 U	110 UJ	110 UJ	1100 U	110 UJ	110 U	110 U	110 U

TABLE 7																			
SOIL ANALYTICAL RESULTS																			
AOI 5 - USTs - PLANT 3																			
PCC - VALIDATION																			
PONTIAC, MICHIGAN																			
Sample Location: Sample Depth: Sample Date: Sample Type:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾					MW33-07	MW33-07	MW33-07	MW34-07	BH36-07	BH36-07	BH36-07	MW37-07	MW40-07	MW43-07	BH89-08	BH90-08
			Residential	Non-Residential	Groundwater	Residential	0-2 ft BGS	16-18 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	13.5-15.5 ft BGS	8-10 ft BGS	0-2 ft BGS	0-2 ft BGS	0-2 ft BGS	10.5-12.5 ft BGS	7-9 ft BGS
			Drinking Water Protection	Drinking Water Protection	Surface Water Interface Protection	Direct Contact	12/03/2007	12/03/2007	12/03/2007	12/04/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/03/2007	12/05/2007	12/06/2007	03/13/2008	03/13/2008
			Value(2)	Value(2)															
Parameters	Units	a	a	b	c	d	p												
Metals																			
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	10600000	4350000	8520000	9010000	4850000	7230000	8320000	7110000	3280000	7410000	6790000	8700000
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	180000	130 J	190 UJ	81 J	160 J	170 UJ	79 J	87 J	530 J	220 J	100 J	180 UJ	43 J
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	3500	1100	3200	4100	3000	6500	5300	3500	2600	4400	3900 J	4000 J
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000	16000	43400	40100	42200	34900	54900	58800	15200	46500 J	25300	68300
Beryllium	ug/kg	584	600	51000	51000	G	410000	1100	190 U	150 J	530 J	250	170 J	190	250	180 U	200 J	180 U	180 U
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	320 J	210 U	120 U	160	320	220 J	290 J	490	91 U	200	140 U	220 U
Calcium	ug/kg	NA	NA	NA	NA	NA	NA	131000000	53300000	85000000	33300000	81100000	77200000	80500000	40700000	2970000	38500000	81300000 J	83300000 J
Chromium	ug/kg	NA	NA	NA	NA	NA	NA	33800 J ^{abcd}	8800	15300 J	14900	8300	11900 J	15200 J	17600	6300	14700 J	12000 J	15000 J
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	NA	33100 J	8800	15300 J	14300	8300	11100 J	13400 J	17600	6300	14200 J	12000	14400
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	NA	730 J	950 UJ	920 U	600 J	840 U	830 J	1800	890 U	910 U	410 J	900 U	620 J
Cobalt	ug/kg	NA	NA	NA	NA	NA	NA	4800 J	5300	7500	8100 J	2800	6100 J	7500 J	8300	2600	7900 J	7500	6500
Copper	ug/kg	NA	NA	NA	NA	NA	NA	19000 J	12100	15300	16100	8800	13100 J	15800 J	142000	8100	19500	15700 J	18100 J
Iron	ug/kg	NA	NA	NA	NA	NA	NA	11100000	7290000	16400000	17400000	7500000	16100000	19200000	16200000	16300000	15400000	13300000	17300000
Lead	ug/kg	NA	NA	NA	NA	NA	NA	19400	7500 J	6300	10300 J	16200 J	6800	6700	18700 J	8300	18700	6800 J	6500 J
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA	1000000000 D	24400000	8190000 J	14500000 J	6840000 J	16100000 J	18200000	14700000	10700000 J	636000	8810000 J	12800000 J	15100000 J
Manganese	ug/kg	4560000	677000	1000	1000	G, X	25000000	921000	322000	352000	295000	285000	268000	382000	306000	130000 J	286000	343000	391000
Mercury	ug/kg	54.1	52 U	1700	1700	50 M	160000	27 J	19 J	46 U	100	42 U	45 U	45 U	24 J	46 U	54	21 J	21 J
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	10400 J	12700	19000	19000	6900	17300 J	21600 J	13300	5700	15200	19300 J	18200 J
Potassium	ug/kg	1280000	2660000	NA	NA	NA	NA	1380000	801000	1950000	1670000	806000	1450000	1760000	747000	673000	1070000	1650000	1650000
Selenium	ug/kg	922	803	4000	4000	400	2600000	240	310	190 U	200 U	150 J	190 U	190 U	270	190 U	190 U	540	570
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M	2500000	180	100	74 J	130	70 J	99	96	94	30 J	75 J	32 J	38 J
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA	1000000000 D	640000	633000	1210000	167000	308000	625000	1210000	1040000	210000	983000	283000 U	506000
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	100 U	190	200	270	52 J	170	240	120	41 J	140	200	160
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	24500 J	10800	18700	20100	13800	15900 J	21100 J	21200	10200	18000	15700 J	20200 J
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	38900 J	42600 J	35900	52800	27700 J	33600 J	38600 J	41600 J	14600	49500	36400	37600
PCBs																			
All PCBs	ug/kg	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																			
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	12000	640 ^{ad}	240 UJ	230 UJ	230 U	210 U	230 UJ	230 UJ	220 UJ	230 U	220 U	230 U	230 U
Total solids	%	NA	NA	NA	NA	NA	NA	89.6	84.2	87.2	86.0	95.0	87.9	88.2	89.8	87.7	88.9	88.5	88.0

Notes:

If results are below select background level, all other criteria are not applicable

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

J The associated value is qualified as an estimated quantity.

UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.

(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 8
GROUNDWATER ANALYTICAL RESULTS
AOI 5 - USTs - FORMER PLANT 3
PCC - VALIDATION
PONTIAC, MICHIGAN

<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>									MW33-07	MW33-07	MW34-07	MW37-07	MW37-07	MW40-07	MW40-07	MW-90-12	MW-91-12	
									01/08/2008	01/09/2008	01/08/2008	01/08/2008	08/28/2012	01/08/2008	01/08/2008	12/07/2012	12/06/2012	
Sample Location:																		
Sample Date:																		
Sample Type:	Residential	NonResidential	Groundwater	Surface Water	Groundwater	Volatilization	Groundwater	Volatilization	Groundwater	Water								
	Drinking Water	Drinking Water	Interface	IndoorAir	Inhalation	IndoorAir	Inhalation	IndoorAir	Contact	Solubility								
Parameters	Units	a	b	c	d	e	f	g										
VOCs																		
1,1,1-Trichloroethane	ug/L	200 A	200 A	89	660000	1300000 S	1300000 S	1330000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	3.1	
1,1,2,2-Tetrachloroethane	ug/L	8.5	35	78 X	12000	77000	4700	2970000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,1,2-Trichloroethane	ug/L	5 A	5 A	330 X	17000	110000	21000	4420000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,1-Dichloroethane	ug/L	880	2500	740	1000000	2300000	2400000	5060000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,1-Dichloroethene	ug/L	7 A	7 A	130	200	1300	11000	2250000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,2,4-Trichlorobenzene	ug/L	70 A	70 A	99 X	300000 S	300000 S	19000	300000	5.0 UJ	--	5.0 UJ	5.0 UJ	--	5.0 UJ	5.0 UJ	5.0 U	5.0 U	
1,2,4-Trimethylbenzene	ug/L	63 E	63 E	17	56000 S	56000 S	56000 S	55890	0.85 J	--	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--	
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2 A	0.2 A	NA	220 S	1200 S	390	1230	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dibromoethane (Ethylene dibromide)	ug/L	0.05 A	0.05 A	5.7 X	2400	15000	25	4200000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichlorobenzene	ug/L	600 A	600 A	13	160000 S		160000 S	156000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichloroethane	ug/L	5 A	5 A	360 X	9600	59000	19000	8520000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,2-Dichloropropane	ug/L	5 A	5 A	230 X	16000	36000	16000	2800000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,3,5-Trimethylbenzene	ug/L	72 E	72 E	45	61000 S	61000 S	61000 S	61150	0.29 J	--	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--	
1,3-Dichlorobenzene	ug/L	6.6	19	28	18000	41000	2000	111000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
1,4-Dichlorobenzene	ug/L	75 A	75 A	17	16000	74000 S	6400	73800	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	13000	38000	2200	240000000 S	240000000 S	240000000 S	2400000000	25 U	--	2.7 J	7.0 J	--	25 U	25 U	25 U	25 U	
2-Hexanone	ug/L	1000	2900	ID	4200000	8700000	5200000	16000000	50 U	--	50 U	50 U	--	50 U	50 U	50 U	50 U	
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/L	1800	5200	ID	20000000 S	20000000 S	13000000	20000000	50 UJ	--	50 UJ	50 UJ	--	50 UJ	50 UJ	50 U	50 U	
Acetone	ug/L	730	2100	1700	1000000000 D,S	1000000000 D,S	31000000	1000000000	25 U	--	25 U	25 U	--	25 U	25 U	50 U	50 U	
Benzene	ug/L	5 A	5 A	200 X	5600	35000	11000	1750000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Bromodichloromethane	ug/L	80 A,W	80 A,W	ID	4800	37000	14000	6740000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Bromoform	ug/L	80 A,W	80 A,W	ID	470000	3100000 S	140000	3100000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Bromomethane (Methyl bromide)	ug/L	10	29	35	4000	9000	70000	14500000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	5.0 U	5.0 U	
Carbon disulfide	ug/L	800	2300	ID	250000	550000	1200000 S	1190000	5.0 U	--	5.0 U	0.36 J	--	5.0 U	5.0 U	5.0 U	5.0 U	
Carbon tetrachloride	ug/L	5 A	5 A	45 X	370	2400	4600	793000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Chlorobenzene	ug/L	100 A	100 A	25	210000	470000 S	86000	472000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Chloroethane	ug/L	430	1700	1100 X	5700000 S	5700000 S	440000	5740000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	5.0 U	5.0 U	
Chloroform (Trichloromethane)	ug/L	80 A,W	80 A,W	350	28000	180000	150000	7920000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.1	
Chloromethane (Methyl chloride)	ug/L	260	1100	ID	8600	45000	490000	6340000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	5.0 U	5.0 U	
cis-1,2-Dichloroethene	ug/L	70 A	70 A	620	93000	210000	200000	3500000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
cis-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	--	1.0 U	1.0 UJ	--	1.0 U	1.0 U	1.0 U	1.0 U	
Cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Dibromochloromethane	ug/L	80 A,W	80 A,W	ID	14000	110000	18000	2600000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	5.0 U	5.0 U	
Dichlorodifluoromethane (CFC-12)	ug/L	1700	4800	ID	220000	300000 S	300000 S	300000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	5.0 U	5.0 U	
Ethylbenzene	ug/L	74 E	74 E	18	110000	170000 S	170000 S	169000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Isopropyl benzene	ug/L	800	2300	28	56000 S	56000 S	56000 S	56000	5.0 U	--	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	
Methyl acetate	ug/L	NA	NA	NA	NA	NA	NA	NA	10 U	--	10 U	10 U	--	10 U	10 U	10 U	10 U	
Methyl cyclohexane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Methyl tert butyl ether (MTBE)	ug/L	40 E	40 E	7100 X	47000000 S	47000000 S	610000	46800000	0.23 J	--	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	
Methylene chloride	ug/L	5 A	5 A	1500 X	220000	1400000	220000	17000000	5.0 U	--	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	
Styrene	ug/L	100 A	100 A	80	170000	310000 S	9700	310000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Tetrachloroethene	ug/L	5 A	5 A	60 X	25000	170000	12000	200000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Toluene	ug/L	790 E	790 E	270	530000 S	530000 S	530000 S	526000	1.8	--	1.0 U	3.1	--	1.0 U	1.0 U	1.0 U	1.2	
trans-1,2-Dichloroethene	ug/L	100 A	100 A	1500 X	85000	200000	220000	6300000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
trans-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Trichloroethene	ug/L	5 A	5 A	200 X	2200	4900	22000	1100000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	23 ^{ab}	
Trichlorofluoromethane (CFC-11)	ug/L	2600	7300	NA	1100000 S	1100000 S	1100000 S	1100000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Trifluorotrichloroethane (Freon 113)	ug/L	170000 S	170000 S	32	170000 S	170000 S	170000 S	170000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Vinyl chloride	ug/L	2 A	2 A	13 X	1100	13000	1000	2760000	1.0 U	--	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	
Xylenes (total)	ug/L	280 E	280 E	41	190000 S	190000 S	190000 S	186000	2.0 U	--	2.0 U	2.0 U	--	2.0 U	2.0 U	3.0 U	3.0 U	

TABLE 8
GROUNDWATER ANALYTICAL RESULTS
AOI 5 - USTs - FORMER PLANT 3
PCC - VALIDATION
PONTIAC, MICHIGAN

<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>									MW33-07 01/08/2008	MW33-07 01/09/2008	MW34-07 01/08/2008	MW37-07 01/08/2008	MW37-07 08/28/2012	MW40-07 01/08/2008	MW40-07 01/08/2008	MW-90-12 12/07/2012	MW-91-12 12/06/2012
Sample Location:	Residential																
Sample Date:	Non-Residential																
Sample Type:	Residential Drinking Water	NonResidential Drinking Water	Groundwater Interface	Surface Water IndoorAirInhalation	Groundwater IndoorAirInhalation	Volatilization IndoorAirInhalation	Groundwater Volatilization	Groundwater Contact	Water Solubility								
Parameters	Units	a	b	c	d	e	f	g									
SVOCs																	
2,4,5-Trichlorophenol	ug/L	730	2100	NA	NLV	NLV	170000	1200000	--	6.2 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	--
2,4,6-Trichlorophenol	ug/L	120	470	5	NLV	NLV	10000	800000	--	5.0 U	4.0 U	4.0 U	5.0 U	4.0 U	4.0 U	--	--
2,6-Dinitrotoluene	ug/L	NA	NA	NA	NA	NA	NA	NA	--	6.2 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	--
2-Chloronaphthalene	ug/L	1800	5200	NA	ID	ID	6700 S	6740	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
2-Chlorophenol	ug/L	45	130	18	ID	ID	94000	22000000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
2-Methylnaphthalene	ug/L	260	750	19	25000	25000	25000 S	24600	--	0.38	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
2-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
2-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA	NA	--	2.5 U	2.0 U	2.0 U	20 U	2.0 U	2.0 U	--	--
2-Nitrophenol	ug/L	20	58	ID	NLV	NLV	79000	2500000	--	2.5 U	2.0 U	2.0 U	5.0 U	2.0 U	2.0 U	--	--
3,3'-Dichlorobenzidine	ug/L	1.1	4.3	0.3 M	NLV	NLV	180	3110	--	1.2 U	1.0 U	R	5.0 U	1.0 U	1.0 U	--	--
3-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA	NA	--	2.5 U	2.0 U	2.0 U	20 U	2.0 U	2.0 U	--	--
Acenaphthene	ug/L	1300	3800	38	4200 S	4200 S	4200 S	4240	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
Acenaphthylene	ug/L	52	150	ID	3900 S	3900 S	3900 S	3930	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
Acetophenone	ug/L	1500	4400	NA	6100000 S	6100000 S	6100000 S	6100000	--	0.55 J	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--
Anthracene	ug/L	43 S	43 S	ID	43 S	43 S	43 S	43.4	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
Atrazine	ug/L	3 A	3 A	7.3	NLV	NLV	5400	70000	--	1.2 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	--	--
Benzaldehyde	ug/L	NA	NA	NA	NA	NA	NA	NA	--	1.2 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--
Benzo(a)anthracene	ug/L	2.1	8.5	ID	NLV	NLV	9.4 S,AA	9.4	--	0.25 U	0.20 U	0.73	5.0 U	0.20 U	0.20 U	1.0 U	--
Benzo(a)pyrene	ug/L	5 A	5 A	ID	NLV	NLV	1 M,AA	1.62	--	0.25 U	0.20 U	0.64	5.0 U	0.20 U	0.20 U	0.58 J	--
Benzo(b)fluoranthene	ug/L	1.5 S,AA	1.5 S,AA	ID	ID	ID	1.5 S,AA	1.5	--	0.25 U	0.20 U	1.2	5.0 U	0.20 U	0.20 U	0.75 J	--
Benzo(g,h,i)perylene	ug/L	1 M	1 M	NA	NLV	NLV	1 M	0.26	--	0.25 U	0.20 U	0.57 ^g	5.0 U	0.20 U	0.20 U	1.0 U	--
Benzo(k)fluoranthene	ug/L	1 M	1 M	NA	NLV	NLV	1 M,AA	0.8	--	0.25 U	0.20 U	0.38	5.0 U	0.20 U	0.20 U	1.0 U	--
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	NA	NA	NA	NA	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	NA	NA	NA	NA	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
bis(2-Chloroethyl)ether	ug/L	2	8.3	1 M	38000	210000	5700	17200000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6 A	6 A	25	NLV	NLV	320 AA	340	--	2.1	1.0 U	1.5	5.0 U	1.0 U	1.0 U	--	--
Butyl benzylphthalate (BBP)	ug/L	1200	2700 S	67 X	NLV	NLV	2700 S	2690	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Caprolactam	ug/L	5800	17000	NA	NLV	NLV	390000000	5250000000	--	6.2 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	--	--
Carbazole	ug/L	85	350	10 M	NLV	NLV	7400	7480	--	1.2 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	--	--
Chrysene	ug/L	1.6 S	1.6 S	ID	ID	ID	1.6 S,AA	1.6	--	0.25 U	0.20 U	0.94	5.0 U	0.20 U	0.20 U	1.0 U	--
Dibenz(a,h)anthracene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	2.49	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	2.0 U	--
Dibenzofuran	ug/L	ID	ID	4	10000	10000	ID	10000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Diethyl phthalate	ug/L	5500	16000	110	NLV	NLV	1100000 S	1080000	--	1.2 U	1.0 U	1.0 U	20 U	1.0 U	1.0 U	--	--
Dimethyl phthalate	ug/L	73000	210000	NA	NLV	NLV	4200000 S	4190000	--	1.2 U	1.0 U	1.0 U	20 U	1.0 U	1.0 U	--	--
Di-n-butylphthalate (DBP)	ug/L	880	2500	9.7	NLV	NLV	11000 S	11200	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	NLV	NLV	400	3000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Fluoranthene	ug/L	210 S	210 S	1.6	210 S	210 S	210 S	206	--	0.25 U	0.20 U	2.5 ^c	5.0 U	0.20 U	0.20 U	1.2	--
Fluorene	ug/L	880	2000 S	12	2000 S	2000 S	2000 S	1980	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
Hexachlorobenzene	ug/L	1 A	1 A	0.2 M	440	3000	4.6	6200	--	0.25 U	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	--	--
Hexachlorobutadiene	ug/L	15	42	0.053	1600	3200 S	400	3230	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Hexachlorocyclopentadiene	ug/L	50 A	50 A	ID	130	420	1600	1800	--	6.2 U	5.0 U	5.0 U	20 U	5.0 U	5.0 U	--	--
Hexachloroethane	ug/L	7.3	21	6.7 X	27000	50000 S	1900	50000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Indeno(1,2,3-cd)pyrene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	0.022	--	0.25 U	0.20 U	0.49 ^g	5.0 U	0.20 U	0.20 U	5.0 U	--
Isophorone	ug/L	770	3100	1300 X	NLV	NLV	990000	12000000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Naphthalene	ug/L	520	1500	11	31000 S	31000 S	31000 S	31000	--	0.92	0.20 U	0.20 U	5.0 U	0.20 U	0.20 U	5.0 U	--
Nitrobenzene	ug/L	3.4	9.6	180 X	280000	550000	11000	2090000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
N-Nitrosodi-n-propylamine	ug/L	5 M	5 M	NA	NLV	NLV	360	9890000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
N-Nitrosodiphenylamine	ug/L	270	1100	NA	NLV	NLV	35000 S	35100	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Pentachlorophenol	ug/L	1 A	1 A	G,X	NLV	NLV	200	1850000	--	6.2 U	5.0 U	5.0 U	20 U	5.0 U	5.0 U	--	--
Phenanthrene	ug/L	52	150	2 M	1000 S	1000 S	1000 S	1000	--	0.25 U	0.20 U	0.87	5.0 U	0.20 U	0.20 U	2.0 U	--
Phenol	ug/L	4400	13000	450	NLV	NLV	29000000	82800000	--	1.2 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	--	--
Pyrene	ug/L	140 S	140 S	ID	140 S	140 S	135	135	--	0.25 U	0.20 U	1.7	5.0 U	0.20 U	0.20 U	1.2 J	--
Pyridine	ug/L	20 M	21	NA	5500	12000	94000	300000	--	1.2 U	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--

TABLE 8
GROUNDWATER ANALYTICAL RESULTS
AOI 5 - USTs - FORMER PLANT 3
PCC - VALIDATION
PONTIAC, MICHIGAN

		Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)							MW33-07	MW33-07	MW34-07	MW37-07	MW37-07	MW40-07	MW40-07	MW-90-12	MW-91-12	
Sample Location:	Sample Date:	Sample Type:	Residential	NonResidential	Groundwater Surface Water	Groundwater Volatilization	Non-Residential	Groundwater	Water	01/08/2008	01/09/2008	01/08/2008	01/08/2008	08/28/2012	01/08/2008	01/08/2008	12/07/2012	12/06/2012
			Drinking Water	Drinking Water	Interface	IndoorAirInhalation	IndoorAirInhalation	Contact	Solubility							Duplicate		
Parameters	Units	a	b	c	d	e	f	g										
Metals																		
Aluminum	ug/L	50 V	50 V	NA	NLV	NLV	64000000	NA	--	929 ^{ab}	366 ^{ab}	48.7 J	--	19.8 J	25.2 J	--	--	
Antimony	ug/L	6 A	6 A	130 X	NLV	NLV	68000	NA	--	1.9 J	2.0 U	1.0 J	--	2.0 U	2.0 U	--	--	
Arsenic	ug/L	10 A	10 A	10	NLV	NLV	4300	NA	--	5.0 U	5.0 U	9.2	--	5.0 U	5.0 U	--	--	
Barium	ug/L	2000 A	2000 A	G	NLV	NLV	14000000	NA	--	448	95.0 J	150	--	103	102	--	--	
Beryllium	ug/L	4 A	4 A	G	NLV	NLV	290000	NA	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--	
Cadmium	ug/L	5 A	5 A	G,X	NLV	NLV	190000	NA	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--	
Calcium	ug/L	NA	NA	NA	NA	NA	NA	NA	--	221000	120000	154000	--	121000	119000	--	--	
Chromium	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	--	41.4 ^c	5.0 U	5.0 U	--	5.0 U	5.0 U	--	--	
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	NLV	NLV	290000000	NA	--	9.9 J	5 UJ	5 UJ	--	5 UJ	5 UJ	--	--	
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	--	30 J ^c	10 UJ	10 UJ	--	10 UJ	10 UJ	--	--	
Cobalt	ug/L	40	100	100	NLV	NLV	2400000	NA	--	7.0 U	7.0 U	7.0 U	--	7.0 U	7.0 U	--	--	
Copper	ug/L	1000 E	1000 E	G	NLV	NLV	7400000	NA	--	7.5	2.4 U	2.3 U	--	2.0 U	2.0 U	--	--	
Iron	ug/L	300 E	300 E	NA	NLV	NLV	58000000	NA	--	102	575 ^{ab}	100 U	--	106	82.5 J	--	--	
Lead	ug/L	4 L	4 L	G,X	NLV	NLV	ID	NA	--	3.0 U	3.0 U	3.0 U	--	3.0 U	3.0 U	--	--	
Magnesium	ug/L	400000	1100000	NA	NLV	NLV	1000000000 D	NA	--	1000 U	28700	39800	--	80000	77700	--	--	
Manganese	ug/L	50 E	50 E	G,X	NLV	NLV	9100000	NA	--	2.5 J	233 ^{ab}	57.0 ^{ab}	--	87.3 ^{ab}	89.8 ^{ab}	--	--	
Mercury	ug/L	2 A	2 A	0.0013	56 S	56 S	56 S	56	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	--	--	
Nickel	ug/L	100 A	100 A	G	NLV	NLV	74000000	NA	--	20.0 U	20.0 U	5.5 J	--	3.2 J	4.3 J	--	--	
Potassium	ug/L	NA	NA	NA	NA	NA	NA	NA	--	20900	3740	14100	--	7490	7550	--	--	
Selenium	ug/L	50 A	50 A	5	NLV	NLV	970000	NA	--	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	--	--	
Silver	ug/L	34	98	0.2 M	NLV	NLV	1500000	NA	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	--	--	
Sodium	ug/L	120000	350000	NA	NLV	NLV	1000000000 D	NA	--	277000 ^a	227000 ^a	367000 ^{ab}	--	1080000 ^{ab}	1040000 ^{ab}	--	--	
Thallium	ug/L	2 A	2 A	3.7 X	NLV	NLV	13000	NA	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	--	--	
Vanadium	ug/L	4.5	62	27	NLV	NLV	970000	NA	--	7.2 ^a	2.4 J	1.8 J	--	4.0 U	4.0 U	--	--	
Zinc	ug/L	2400	5000 E	G	NLV	NLV	110000000	NA	--	20.0 U	20.0 U	20.0 U	--	20.0 U	20.0 U	--	--	
PCBs																		
All PCBs	ug/L	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																		
Cyanide (amenable)	ug/L	200 A	200 A	NA	NLV	NLV	57000	NA	--	5 U	5 U	5 U	--	5 U	5 U	--	--	

TABLE 9
SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																		
										MW13-07	MW13-07	MW13-07	BH98-12	BH98-12	BH98-12	BH99-12	BH99-12	BH99-12	BH100-12	BH100-12	BH100-12
										0-2 ft BGS	0-2 ft BGS	7-9 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	13-15 ft BGS
	Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	10/18/2007	10/18/2007	10/18/2007	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact													
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection					Duplicate										Duplicate
Parameters	Units	a	a	b	c	d	e	p	q												
VOCs																					
All VOCs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
							10000000														
SVOCs							NA														
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	NA	23000000	73000000	710 U	790 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	NA	710000	3300000	710 U	790 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	970000	660000 DD	1800000 C,DD	710 U	790 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	440000	11000000	36000000	710 U	790 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	1600 U	1700 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	NA	48000	220000	950 U	1100 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	950 U	1100 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	NA	56000000	180000000	240 U	260 U	--	860 U	85 U	92 U	830 U	86 U	940 U	82 U	92 U	94 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	NLL	1400000	4500000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	NLL	8100000	26000000	86	53	--	460 J	85 U	92 U	830 U	86 U	940 U	82 U	92 U	94 U
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	950 U	1100 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	950 U	1100 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	NLL	630000	2000000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	NA	6600	30000	480 U	530 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	950 U	1100 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
4,6-Dinitro-2-methylphenol	ug/kg	NA	NA	830 M	830 M	NA	NA	79000	260000	710 U	790 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
4-Chloro-3-methylphenol	ug/kg	NA	NA	5800	16000	280	310000 C	4500000	15000000	710 U	790 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	710 U	790 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
4-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	950 U	1100 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	950 U	1100 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	1600 U	1700 U	--	7100 U	700 U	760 U	6800 U	710 U	7700 U	670 U	760 U	770 U
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	740000 C	41000000	130000000	32 U	35 U	--	320 U	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	790000 C	1600000	5200000	41	35 U	--	320 U	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Acetophenone	ug/kg	NA	NA	30000	88000	ID	760000 C	1100000 C	1100000 C	480 U	530 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	140000000 C	230000000	730000000	32 U	35 U	--	320 U	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Atrazine	ug/kg	NA	NA	60	60	150	730000	71000 DD	330000 DD	950 U	1100 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	480 U	530 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	8200	20000	80000	32 U	35 U	--	870	32 U	35 U	590	32 U	220 J	31 U	34 U	35 U

TABLE 9

SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																		
			Residential		Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	MW13-07	MW13-07	MW13-07	BH98-12	BH98-12	BH98-12	BH99-12	BH99-12	BH99-12	BH100-12	BH100-12	BH100-12
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	0-2 ft BGS	0-2 ft BGS	7-9 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	13-15 ft BGS	
	Background Value(2)	Background Value(2)	Drinking Water Protection	Drinking Water Protection	Surface Water Interface Protection	Contact Protection	Direct Contact	Direct Contact	10/18/2007	10/18/2007	10/18/2007	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	Duplicate
Parameters	Units	a	a	b	c	d	e	p	q												
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	350000 C	2000	8000	32 U	35 U	--	880	32 U	35 U	700	32 U	300 J	31 U	34 U	35 U
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	720000 C	20000	80000	32 U	35 U	--	950	32 U	35 U	880	32 U	340 J	31 U	34 U	35 U
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	NLL	2500000	7000000	110	59	--	580	32 U	35 U	420	32 U	350 U	31 U	34 U	35 U
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	2400000 C	200000	800000	32 U	35 U	--	680	32 U	35 U	660	32 U	310 J	31 U	34 U	35 U
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	240 U	260 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	480 U	530 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
bis(2-Chloroethyl)ether	ug/kg	NA	NA	100	170	100 M	4300	13000	58000	480 U	530 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	NA	NA	NLL	NLL	NLL	1100000	2800000	10000000 C	240 U	260 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Butyl benzylphthalate (BBP)	ug/kg	NA	NA	310000 C	310000 C	120000 X	12000000 C	310000 C	310000 C	240 U	260 U	--	1700 U	170 U	180 U	2100	170 U	1900 U	160 U	180 U	190 U
Caprolactam	ug/kg	NA	NA	120000	340000	NA	NA	53000000 DD	310000000 DD	1600 U	1700 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Carbazole	ug/kg	NA	NA	9400	39000	1100		530000	2400000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL		2000000	8000000	32 U	35 U	--	920	32 U	35 U	760	32 U	320 J	31 U	34 U	35 U
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL		2000	8000	32 U	35 U	--	320 U	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	1000000000 D	ID	ID	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	49000000	740000 C	740000 C	240 U	260 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	NA	790000 C	790000 C	240 U	260 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	1000000000 D	760000 C	760000 C	240 U	260 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	1000000000 D	6900000	20000000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	230000000	46000000	130000000	150	120	--	1700	32 U	35 U	1500	32 U	520	31 U	34 U	35 U
Fluorene	ug/kg	NA	NA	390000	890000	5300	140000000	27000000	87000000	32 U	35 U	--	320 U	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	48000000	8900	37000	32 U	35 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	1000000000 D	100000	350000 C	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	1000000000 D	720000 C	720000 C	1600 UJ	1700 UJ	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	ID	230000	730000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	180000000	20000	80000	95	35 U	--	570	32 U	35 U	410	32 U	350 U	31 U	34 U	35 U
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	47000	2400000 C	2400000 C	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	1000000000 D	16000000	52000000	32 U	35 U	--	290 J	32 U	35 U	310 U	32 U	350 U	31 U	34 U	35 U
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	78000000	100000	340000	480 U	530 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	NA	1200	5400	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	NA	1700000	7800000	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	1000000000 D	90000	320000	710 U	790 U	--	3500 U	350 U	380 U	3400 U	350 U	3900 U	340 U	380 U	390 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1000000000 D	1600000	5200000	100	61	--	900	32 U	35 U	650	32 U	350 U	31 U	34 U	35 U
Phenol	ug/kg	NA	NA	88000	260000	9000		12000000 C,DD	12000000 C,DD	240 U	260 U	--	1700 U	170 U	180 U	1700 U	170 U	1900 U	160 U	180 U	190 U
Pyrene	ug/kg	NA	NA	480000	480000	ID		29000000	84000000	150 J	75 J	--	1300	32 U	35 U	1000	32 U	380	31 U	34 U	35 U
Pyridine	ug/kg	NA	NA	400	420	NA	NA	37000 C	37000 C	480 U	530 U	--	--	--	--	--	--	--	--	--	--
							NLL														

TABLE 9

SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																	
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	MW13-07	MW13-07	MW13-07	BH98-12	BH98-12	BH98-12	BH99-12	BH99-12	BH99-12	BH100-12	BH100-12	BH100-12
Sample Depth:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	0-2 ft BGS	0-2 ft BGS	7-9 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	13-15 ft BGS
Sample Date:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection			10/18/2007	10/18/2007	10/18/2007	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012
Sample Type:												Duplicate								Duplicate
Parameters	Units	a	a	b	c	d	e	p	q											
Metals							NLL													
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	NLL	50000000 DD	370000000 DD	6320000	8190000	--	--	--	--	--	--	--	--	--
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	NLL	180000	670000	1500 J	2500 J	--	--	--	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	NLL	7600	37000	6900	3800	--	--	--	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	NLL	37000000	130000000	84600 J	114000 J	--	--	--	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G		410000	1600000	100 J	140 J	--	--	--	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X		550000	2100000	1500 J	7800 J ^{abc}	--	--	--	--	--	--	--	--	--
Calcium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	39200000	27100000	--	--	--	--	--	--	--	--	--
Chromium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	18300	22900 ^{ad}	--	--	--	--	--	--	--	--	--
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	16600	21800	--	--	--	--	--	--	--	--	--
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	1700	1200	--	--	--	--	--	--	--	--	--
Cobalt	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	8200	7200	--	--	--	--	--	--	--	--	--
Copper	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	67100 J	113000 J	--	--	--	--	--	--	--	--	--
Iron	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	38700000 ^{abc}	17100000	--	--	--	--	--	--	--	--	--
Lead	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	242000	446000 ^{ap}	14500 J	--	--	--	--	--	--	--	--
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA		1000000000 D	1000000000 D	11100000 J	6070000 J	--	--	--	--	--	--	--	--	--
Manganese	ug/kg	4560000	677000	1000	1000	G, X		25000000	90000000	469000	317000	--	--	--	--	--	--	--	--	--
Mercury	ug/kg	54.1	52 U	1700	1700	50 M		160000	580000	440 J ^{ad}	390 ^{ad}	--	--	--	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G		40000000	150000000	20000	28800	--	--	--	--	--	--	--	--	--
Potassium	ug/kg	1280000	2660000	NA	NA	NA		NA	NA	1100000	1400000	--	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400		2600000	9600000	330	150 J	--	--	--	--	--	--	--	--	--
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M		2500000	9000000	130	150	--	--	--	--	--	--	--	--	--
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA		1000000000 D	1000000000 D	182000	192000	--	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X		35000	130000	220	170	--	--	--	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000		750000 DD	5500000 DD	17900	20000	--	--	--	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G		170000000	630000000	122000	79000	--	--	--	--	--	--	--	--	--
PCBs																				
All PCBs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																				
Cyanide (total)	ug/kg	NA	NA	4000	4000	100		12000	250000	240 U	210 U	--	--	--	--	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	7.1	9.6	16	4.1	7.8	15	2.5	15
Total solids	%	NA	NA	NA	NA	NA	NA	NA	NA	84.0	94.3	82.2	--	--	--	--	--	--	--	--

Notes:

If results are below select background level, all other criteria are not applicable

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

J The associated value is qualified as an estimated quantity.

UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 P.A. 451 as amended.

(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

- Indicates concentration exceeded Part 201 Cleanup Criteria

- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 9
SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																			
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH100-12 9-11 ft BGS	BH101-12 0-2 ft BGS	BH101-12 13-15 ft BGS	BH101-12 9-11 ft BGS	BH107-12 13-15 ft BGS	BH107-12 9-11 ft BGS	BH107-12 0-2 ft BGS	BH109-12 3-4 ft BGS	BH109-12 0-2 ft BGS	BH110-12 3-4 ft BGS	BH110-12 0-2 ft BGS	BH111-12 0-2 ft BGS	BH111-12 0-2 ft BGS	BH111-12 3-4 ft BGS
	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012
	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection														Duplicate		
Parameters	Units	a	a	b	c	d	e	p	q													
VOCs																						
All VOCs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
							10000000															
SVOCs							NA															
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	NA	23000000	73000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	NA	710000	3300000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	970000	660000 DD	1800000 C,DD	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	440000	11000000	36000000	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	NA	48000	220000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	NA	56000000	180000000	95 U	830 U	88 U	83 U	88 U	870 U	--	--	--	--	--	--	--
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	NLL	1400000	4500000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	NLL	8100000	26000000	95 U	210 J	88 U	83 U	88 U	690 J	440 U	470 U	860 U	39 J	630 U	380 J	270
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	NLL	630000	2000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	NA	6600	30000	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/kg	NA	NA	830 M	830 M	NA	NA	79000	260000	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
4-Chloro-3-methylphenol	ug/kg	NA	NA	5800	16000	280	310000 C	4500000	15000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
4-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	780 U	6900 U	720 U	690 U	720 U	7100 U	--	--	--	--	--	--	--
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	740000 C	41000000	130000000	36 U	250 J	33 U	31 U	33 U	1300	160 U	180 U	200 J	48 U	230 U	230 U	33 U
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	790000 C	1600000	5200000	36 U	310 U	33 U	31 U	33 U	390	160 U	180 U	320 U	48 U	230 U	230 U	33 U
Acetophenone	ug/kg	NA	NA	30000	88000	ID	760000 C	1100000 C	1100000 C	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Anthracene	ug/kg	NA	NA	41000	41000	ID	140000000 C	230000000	730000000	36 U	990	33 U	31 U	33 U	2000	170	180 U	620	48 U	230 J	290	27 J
Atrazine	ug/kg	NA	NA	60	60	150	730000	71000 DD	330000 DD	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	8200	20000	80000	36 U	5000	33 U	31 U	33 U	4400	1300	320	3700	54	1300	1500	82

TABLE 9

SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																			
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH100-12	BH101-12	BH101-12	BH101-12	BH107-12	BH107-12	BH109-12	BH109-12	BH110-12	BH110-12	BH111-12	BH111-12	BH111-12	
			Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	9-11 ft BGS	0-2 ft BGS	13-15 ft BGS	9-11 ft BGS	13-15 ft BGS	9-11 ft BGS	0-2 ft BGS	3-4 ft BGS	0-2 ft BGS	3-4 ft BGS	0-2 ft BGS	0-2 ft BGS	3-4 ft BGS	
			Protection	Protection	Interface Protection	Protection			08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	Duplicate
Parameters	Units	a	a	b	c	d	e	p	q													
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	350000 C	2000	8000	36 U	5300 ^P	33 U	31 U	33 U	4400 ^P	1700	470	4000 ^P	120	1600	1800	100
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	720000 C	20000	80000	36 U	6500	33 U	31 U	33 U	4600	2100	660	4800	66	2100	2500	180
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	NLL	2500000	7000000	36 U	2600	33 U	31 U	33 U	1600	1200	330	2200	58	770	850	60
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	2400000 C	200000	800000	36 U	2600	33 U	31 U	33 U	4300	670	150 J	1800	89	630	720	31 J
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	390 U	3400 U	360 U	340 U	360 U	260 J	--	--	--	--	--	--	--
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
bis(2-Chloroethyl)ether	ug/kg	NA	NA	100	170	100 M	4300	13000	58000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	NA	NA	NLL	NLL	NLL	1100000	2800000	10000000 C	390 U	3400 U	360 U	340 U	19 J	380 J	--	--	--	--	--	--	--
Butyl benzylphthalate (BBP)	ug/kg	NA	NA	310000 C	310000 C	120000 X	12000000 C	310000 C	310000 C	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Caprolactam	ug/kg	NA	NA	120000	340000	NA	NA	53000000 DD	310000000 DD	390 U	3400 U	360 U	340 U	330 J	3600 U	--	--	--	--	--	--	--
Carbazole	ug/kg	NA	NA	9400	39000	1100		530000	2400000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL		2000000	8000000	36 U	5300	33 U	31 U	33 U	4900	1600	470	3700	81	1600	1800	170
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL		2000	8000	36 U	830	33 U	31 U	33 U	560	320	180 U	660	48 U	230 J	270	20 J
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	1000000000 D	ID	ID	190 U	1700 U	180 U	170 U	180 U	990 J	--	--	--	--	--	--	--
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	49000000	740000 C	740000 C	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	NA	790000 C	790000 C	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	1000000000 D	760000 C	760000 C	390 U	3400 U	360 U	340 U	360 U	180 J	--	--	--	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	1000000000 D	6900000	20000000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	230000000	46000000	130000000	20 J	9400 ^d	33 U	31 U	33 U	10000 ^d	2600	720	6900 ^d	110	2900	3100	170
Fluorene	ug/kg	NA	NA	390000	890000	5300	140000000	27000000	87000000	36 U	240 J	33 U	31 U	33 U	1600	160 U	180 U	320 U	48 U	230 U	230 U	33 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	48000000	8900	37000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	1000000000 D	100000	350000 C	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	1000000000 D	720000 C	720000 C	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	ID	230000	730000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	180000000	20000	80000	36 U	2700	33 U	31 U	33 U	1700	1100	310	2200	53	790	870	46
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	47000	2400000 C	2400000 C	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Naphthalene	ug/kg	NA	NA	35000	100000	730	1000000000 D	16000000	52000000	36 U	310 U	33 U	31 U	33 U	910 ^d	160 U	180 U	320 U	48 U	230 U	230 J	110
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	78000000	100000	340000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	NA	1200	5400	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	NA	1700000	7800000	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	1000000000 D	90000	320000	390 U	3400 U	360 U	340 U	360 U	3600 U	--	--	--	--	--	--	--
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1000000000 D	1600000	5200000	36 U	4000 ^d	33 U	31 U	33 U	9900 ^d	910	350	3100 ^d	65	1300	1400	300
Phenol	ug/kg	NA	NA	88000	260000	9000		12000000 C,DD	12000000 C,DD	190 U	1700 U	180 U	170 U	180 U	1700 U	--	--	--	--	--	--	--
Pyrene	ug/kg	NA	NA	480000	480000	ID		29000000	84000000	36 U	7600	33 U	31 U	33 U	9100	2300	680	6000	75	2500	2800	190
Pyridine	ug/kg	NA	NA	400	420	NA	NA	37000 C	37000 C	--	--	--	--	--	--	--	--	--	--	--	--	--
							NLL															

TABLE 9

SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																		
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH100-12 9-11 ft BGS	BH101-12 0-2 ft BGS	BH101-12 13-15 ft BGS	BH101-12 9-11 ft BGS	BH107-12 13-15 ft BGS	BH107-12 9-11 ft BGS	BH109-12 0-2 ft BGS	BH109-12 3-4 ft BGS	BH110-12 0-2 ft BGS	BH110-12 3-4 ft BGS	BH111-12 0-2 ft BGS	BH111-12 0-2 ft BGS	BH111-12 3-4 ft BGS
Sample Depth:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012	12/05/2012
Sample Date:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection															
Sample Type:																				Duplicate	
Parameters	Units	a	a	b	c	d	e	p	q												
Metals																					
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	NLL	50000000 DD	370000000 DD	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	NLL	180000	670000	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	NLL	7600	37000	--	--	--	--	--	--	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	NLL	37000000	130000000	--	--	--	--	--	--	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G		410000	1600000	--	--	--	--	--	--	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X		550000	2100000	--	--	--	--	--	--	--	--	--	--	--	--
Calcium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Copper	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Iron	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Lead	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA		1000000000 D	1000000000 D	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	ug/kg	4560000	677000	1000	1000	G, X		25000000	90000000	--	--	--	--	--	--	--	--	--	--	--	--
Mercury	ug/kg	54.1	52 U	1700	1700	50 M		160000	580000	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G		40000000	150000000	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	ug/kg	1280000	2660000	NA	NA	NA		NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400		2600000	9600000	--	--	--	--	--	--	--	--	--	--	--	--
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M		2500000	9000000	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA		1000000000 D	1000000000 D	--	--	--	--	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X		35000	130000	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000		750000 DD	550000 DD	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G		170000000	630000000	--	--	--	--	--	--	--	--	--	--	--	--
PCBs																					
All PCBs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																					
Cyanide (total)	ug/kg	NA	NA	4000	4000	100		12000	250000	--	--	--	--	--	--	--	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	NA	NA	NA	17	6.1	9.2	6.4	9.2	10	9.7	16	8.0	8.5	9.9	9.3
Total solids	%	NA	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

If results are below select background level, all other criteria are not applicable

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

J The associated value is qualified as an estimated quantity.

UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 P.A. 451 as amended.

(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

- Indicates concentration exceeded Part 201 Cleanup Criteria

- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 9
SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																		
			Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH115-12	BH115-12	TP-1	TP-1	TP-1	TP-1	TP-2	TP-2	TP-3	TP-3	TP-4	TP-4	
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	0-2 ft BGS	3-4 ft BGS	10-10 ft BGS	10-10 ft BGS	6-6 ft BGS	7-7 ft BGS	4-4 ft BGS	6.5-6.5 ft BGS	3-3 ft BGS	7-7 ft BGS	10-10 ft BGS	5-5 ft BGS	
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	12/05/2012	12/05/2012	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection															
Parameters	Units	a	a	b	c	d	e	p	q												
VOCs																					
All VOCs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	
							10000000														
SVOCs							NA														
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	NA	23000000	73000000	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	NA	710000	3300000	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	970000	660000 DD	1800000 C,DD	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	440000	11000000	36000000	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	1600 U	260000 U	3700 U	2400 U	380 U	R	1800 U	370 UJ	390 U	940 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	NA	48000	220000	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	NA	56000000	180000000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	NLL	1400000	4500000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	NLL	8100000	26000000	870 U	1700 U	42	36000 ^d	110	330	520	160	96	160 J	7.9 U	130
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	NLL	630000	2000000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	NA	6600	30000	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
4,6-Dinitro-2-methylphenol	ug/kg	NA	NA	830 M	830 M	NA	NA	79000	260000	--	--	750 U	120000 U	1700 U	1100 U	170 U	R	800 U	170 UJ	180 U	430 U
4-Bromophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
4-Chloro-3-methylphenol	ug/kg	NA	NA	5800	16000	280	310000 C	4500000	15000000	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
4-Chloroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
4-Chlorophenyl phenyl ether	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
4-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	NLL	11000000	36000000	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
4-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
4-Nitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	1600 U	260000 U	3700 U	2400 U	380 U	760 U	1800 U	370 UJ	390 U	940 U
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	740000 C	41000000	130000000	330 U	650 U	44	130000 ^d	140	520	24	69	35 U	34 J	7.9 U	19 U
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	790000 C	1600000	5200000	330 U	650 U	33 U	5300 U	74 U	93	50	15 U	66	22 J	7.9 U	19 U
Acetophenone	ug/kg	NA	NA	30000	88000	ID	760000 C	1100000 C	1100000 C	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	140000000 C	230000000	730000000	330 U	650 U	100	200000 ^{bce}	74 U	1500	73	260	84	66 J	7.9 U	61
Atrazine	ug/kg	NA	NA	60	60	150	730000	71000 DD	330000 DD	--	--	990 U	160000 U	2200 U	1500 U	230 U	460 U	1100 U	220 UJ	240 U	570 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	8200	20000	80000	330 U	650 U	390	350000 ^{Pa}	74 U	3300	160	970	210	200 J	7.9 U	140

TABLE 9
SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																		
			Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH115-12 0-2 ft BGS	BH115-12 3-4 ft BGS	TP-1 10-10 ft BGS	TP-1 10-10 ft BGS	TP-1 6-6 ft BGS	TP-1 7-7 ft BGS	TP-2 4-4 ft BGS	TP-2 6.5-6.5 ft BGS	TP-3 3-3 ft BGS	TP-3 7-7 ft BGS	TP-4 10-10 ft BGS	TP-4 5-5 ft BGS	
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	0-2 ft BGS	3-4 ft BGS	10-10 ft BGS	10-10 ft BGS	6-6 ft BGS	7-7 ft BGS	4-4 ft BGS	6.5-6.5 ft BGS	3-3 ft BGS	7-7 ft BGS	10-10 ft BGS	5-5 ft BGS	
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	12/05/2012	12/05/2012	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection															
Parameters	Units	a	a	b	c	d	e	p	q												
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	350000 C	2000	8000	200 J	650 U	430	270000 ^{Pq}	140	3300 ^P	170	820	290	210 J	7.9 U	160
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	720000 C	20000	80000	220 J	650 U	620	360000 ^{Pq}	150	4400	280	1100 J	450	300 J	7.9 U	240
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	NLL	2500000	7000000	330 U	650 U	360	150000	74 U	2900	130	590	260	180 J	7.9 U	140
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	2400000 C	200000	800000	330 U	650 U	170	170000	100	1400	98	390	150	120 J	7.9 U	85
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	250 U	40000 U	550 U	370 U	39 J	120 U	270 U	56 UJ	59 U	140 U
bis(2-Chloroethoxy)methane	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
bis(2-Chloroethyl)ether	ug/kg	NA	NA	100	170	100 M	4300	13000	58000	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg	NA	NA	NLL	NLL	NLL	1100000	2800000	10000000 C	--	--	250 U	40000 U	550 U	370 U	56 J	44 J	270 U	64 UJ	29 J	140 U
Butyl benzylphthalate (BBP)	ug/kg	NA	NA	310000 C	310000 C	120000 X	12000000 C	310000 C	310000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Caprolactam	ug/kg	NA	NA	120000	340000	NA	NA	53000000 DD	310000000 DD	--	--	1600 U	260000 U	3700 U	2400 U	380 U	760 U	1800 U	370 UJ	390 U	940 U
Carbazole	ug/kg	NA	NA	9400	39000	1100		530000	2400000	--	--	250 U	130000 ^{bcd}	550 U	450	40 J	140	270 U	43 J	59 U	140 U
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL		2000000	8000000	210 J	650 U	380	350000	93	3200	220	950	330	260 J	7.9 U	220
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL		2000	8000	330 U	650 U	84	47000 ^{Pq}	74 U	580	36	140	59	43 J	7.9 U	32
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	1000000000 D	ID	ID	--	--	250 U	79000 ^d	550 U	310 J	130	61 J	270 U	53 J	59 U	140 U
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	49000000	740000 C	740000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	NA	790000 C	790000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	1000000000 D	760000 C	760000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	170 J	56 UJ	59 U	140 U
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	1000000000 D	6900000	20000000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	230000000	46000000	130000000	270 J	650 U	770	960000 ^{bcd}	300	7300 ^d	300	1900 J	410	440 J	7.9 U	340
Fluorene	ug/kg	NA	NA	390000	890000	5300	140000000	27000000	87000000	330 U	650 U	53	150000 ^d	96	520	29	74	35 U	40 J	7.9 U	24
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	48000000	8900	37000	--	--	33 U	5300 U	74 U	49 U	7.7 U	15 U	35 U	7.5 UJ	7.9 U	19 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	1000000000 D	100000	350000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	1000000000 D	720000 C	720000 C	--	--	1600 U	260000 U	3700 U	2400 U	R	R	1800 U	370 UJ	390 U	940 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	ID	230000	730000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	180000000	20000	80000	330 U	650 U	280	130000 ^{Pq}	74 U	2300	100	500	210	150 J	7.9 U	100
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	47000	2400000 C	2400000 C	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	1000000000 D	16000000	52000000	330 U	650 U	33 U	5300 U	74 U	280	330	100	49	110 J	7.9 U	80
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	78000000	100000	340000	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	NA	1200	5400	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	NA	1700000	7800000	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	1000000000 D	90000	320000	--	--	750 U	120000 U	1700 U	1100 U	170 U	350 U	800 U	170 UJ	180 U	430 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1000000000 D	1600000	5200000	330 U	650 U	370	900000 ^{bcd}	250	4900 ^d	340	980	210	300 J	7.9 U	250
Phenol	ug/kg	NA	NA	88000	260000	9000		12000000 C,DD	12000000 C,DD	--	--	250 U	40000 U	550 U	370 U	57 U	120 U	270 U	56 UJ	59 U	140 U
Pyrene	ug/kg	NA	NA	480000	480000	ID		29000000	84000000	300 J	600 J	600	700000 ^{bce}	280	6100	240	1600 J	370	370 J	7.9 U	270
Pyridine	ug/kg	NA	NA	400	420	NA	NA	37000 C	37000 C	--	--	500 U	79000 U	1100 U	740 U	110 U	230 U	530 U	110 UJ	120 U	290 U
							NLL														

TABLE 9

SOIL ANALYTICAL RESULTS
AOI 12 - BARE SOIL AREA
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾																	
	Selected	Selected	Residential	Non-Residential	Groundwater	Groundwater	Residential	Non-Residential	BH115-12 0-2 ft BGS	BH115-12 3-4 ft BGS	TP-1 10-10 ft BGS	TP-1 10-10 ft BGS	TP-1 6-6 ft BGS	TP-1 7-7 ft BGS	TP-2 4-4 ft BGS	TP-2 6.5-6.5 ft BGS	TP-3 3-3 ft BGS	TP-3 7-7 ft BGS	TP-4 10-10 ft BGS	TP-4 5-5 ft BGS
Sample Depth:	Background	Background	Drinking Water	Drinking Water	Surface Water	Contact	Direct Contact	Direct Contact	12/05/2012	12/05/2012	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007	10/10/2007
Sample Date:	Value(2)	Value(2)	Protection	Protection	Interface Protection	Protection														
Sample Type:																				
Parameters	Units	a	a	b	c	d	e	p	q											
Metals																				
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	NLL	50000000 DD	370000000 DD	--	--	53900000	99200000	56600000	57900000	55500000	54600000	44200000	43200000	36500000
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	NLL	180000	6700000	--	--	310 UJ	1500 J	180 UJ	530 J	270 UJ	390 J	510 J	220 UJ	190 UJ
Arsenic	ug/kg	7020	9610	4600	4600	4600	NLL	7600	37000	--	--	5100	11400 ^{abcdp}	4100	5900	7300	4300	6500	4600	3300
Barium	ug/kg	240000	79700	1300000	1300000	G	NLL	37000000	130000000	--	--	44800	263000	35600	64800	42100	40300	39900	32000	17200
Beryllium	ug/kg	584	600	51000	51000	G		410000	1600000	--	--	74 J	260	56 J	77 J	170 J	77 J	100 J	89 J	190 U
Cadmium	ug/kg	549	673	6000	6000	G,X		550000	2100000	--	--	300	1400	210	430	230	150	560	270	150
Calcium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	54400000	42700000	52200000	29100000	44100000	90700000	38600000	77600000	94900000
Chromium	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	16700	67400 ^{abcd}	11500	21800 ^d	11600	11100	9700	10900	8100
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	16000	67400	8400	21100	10800	9900	9200	10200	7700
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	740 J	1400	3100	770 J	740 J	1300	510 J	690 J	490 J
Cobalt	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	5800	12900	5900	6800	5600	4400	5300	4800	4600
Copper	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	67000	404000	17200	203000	21300	17600	25600	22900	17100
Iron	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	16000000	39300000 ^{abc}	12600000	15500000	14500000	11500000	12000000	11800000	10200000
Lead	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	--	--	139000	835000 ^{abcp}	14000	127000	52700	33000	20600	29200	5600
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA		1000000000 D	1000000000 D	--	--	10200000	11900000	11500000	7060000	12100000	9250000	7890000	10000000	15700000
Manganese	ug/kg	4560000	677000	1000	1000	G, X		25000000	90000000	--	--	317000	391000	363000	240000	349000	254000	348000	270000	370000
Mercury	ug/kg	54.1	52 U	1700	1700	50 M		160000	580000	--	--	58	390 ^d	22 J	91	87	24 J	40 J	44 J	47 U
Nickel	ug/kg	20000	31300	100000	100000	G		40000000	150000000	--	--	38200	123000 ^{abc}	17300	39300	13200	10400	19800	12900	10200
Potassium	ug/kg	1280000	2660000	NA	NA	NA		NA	NA	--	--	786000	1650000	1070000	938000	1020000	1330000	909000	825000	618000
Selenium	ug/kg	922	803	4000	4000	400		2600000	9600000	--	--	210 U	1200 ^{ad}	190 U	230	410	200 U	160 J	110 J	150 J
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M		2500000	9000000	--	--	98 J	440	60 J	130	75 J	66 J	93	62 J	48 J
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA		1000000000 D	1000000000 D	--	--	543000	711000	552000	191000	574000	472000	97000	420000	368000
Thallium	ug/kg	190	432	2300	2300	4200 X		35000	130000	--	--	140	280	150	150	150	130	170	120	130
Vanadium	ug/kg	30800	23800	72000	990000	430000		750000 DD	550000 DD	--	--	15300	28300	15300	16800	14900	13700	26000	13300	11400
Zinc	ug/kg	56300	64100	2400000	5000000	G		170000000	630000000	--	--	152000	411000	57100	101000	55100	41300	70600	58600	25000
PCBs																				
All PCBs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																				
Cyanide (total)	ug/kg	NA	NA	4000	4000	100		12000	250000	--	--	310 J	1400 J ^{ad}	220 U	130 J	120 J	200 J	180 J	130 J	240 U
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	NA	NA	NA	9.4	9.5	--	--	--	--	--	--	--	--	--
Total solids	%	NA	NA	NA	NA	NA	NA	NA	NA	--	--	80.5	63.1	90.3	90.2	87.0	86.6	94.1	89.3	84.6

Notes:

If results are below select background level, all other criteria are not applicable

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

J The associated value is qualified as an estimated quantity.

UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 P.A. 451 as amended.

(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

- Indicates concentration exceeded Part 201 Cleanup Criteria

- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 10

SOIL ANALYTICAL RESULTS
AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾</u>						BH72-08	BH72-08	BH72-08	BH73-08	BH102-12	BH102-12	BH102-12	BH103-12	BH103-12
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	0-2 ft BGS	12-14 ft BGS	8-10 ft BGS	8-10 ft BGS	0-2 ft BGS	12-14 ft BGS	22-24 ft BGS	0-2 ft BGS	12-14 ft BGS	
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact	03/13/2008	03/13/2008	03/13/2008	03/14/2008	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection												
Parameters	Units	a	a	b	c	d	p	q									
VOCs																	
All VOCs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE
SVOCs																	
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	23000000	73000000	--	8700 U	--	180 U	--	180 U	--	--	180 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	12000 U	--	240 U	--	180 U	--	--	180 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	--	38000 ^d	--	8.1 U	--	910	--	--	3400
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	--	12000 U	--	240 U	--	180 U	--	--	180 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	12000 U	--	240 U	--	740 U	--	--	740 U
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	630000	2000000	--	2900 U	--	61 U	--	180 U	--	--	180 U
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	6600	30000	--	5800 U	--	120 U	--	740 U	--	--	740 U
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	12000 U	--	240 U	--	740 U	--	--	740 U
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	41000000	130000000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	1600000	5200000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Acetophenone	ug/kg	NA	NA	30000	88000	ID	1100000 C	1100000 C	--	5800 U	--	120 U	--	370 U	--	--	370 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	--	12000 U	--	240 U	--	370 U	--	--	370 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	5800 U	--	120 U	--	370 U	--	--	370 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	390 U	--	8.1 U	--	28 J	--	--	45
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	2700 J	--	61 U	--	370 U	--	--	200 J
Caprolactam	ug/kg	NA	NA	120000	340000	NA	53000000 DD	100000000 DI	--	19000 U	--	400 U	--	370 U	--	--	370 U
Carbazole	ug/kg	NA	NA	9400	39000	1100	530000	2400000	--	2900 U	--	61 U	--	180 U	--	--	180 U
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL	2000000	8000000	--	390 U	--	8.1 U	--	47	--	--	70
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	--	390 U	--	8.1 U	--	34 U	--	--	34 U

TABLE 10
SOIL ANALYTICAL RESULTS
AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾						BH72-08	BH72-08	BH72-08	BH73-08	BH102-12	BH102-12	BH102-12	BH103-12	BH103-12
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	on-Residenti	0-2 ft BGS	12-14 ft BGS	8-10 ft BGS	8-10 ft BGS	0-2 ft BGS	12-14 ft BGS	22-24 ft BGS	0-2 ft BGS	12-14 ft BGS	
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contac	03/13/2008	03/13/2008	03/13/2008	03/14/2008	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection												
Parameters	Units	a	a	b	c	d	p	q									
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	ID	ID	--	2900 U	--	61 U	--	180 U	--	--	180 U
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	--	2900 U	--	61 U	--	370 U	--	--	370 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	--	2900 U	--	61 U	--	370 U	--	--	370 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	--	2900 U	--	61 U	--	370 U	--	--	370 U
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	--	2900 U	--	61 U	--	180 U	--	--	180 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	--	390 U	--	8.1 U	--	41	--	--	75
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	--	390 U	--	8.1 U	--	180 U	--	--	180 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	--	2900 U	--	61 U	--	180 U	--	--	180 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	390 U	--	8.1 U	--	34 U	--	--	34 U
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	--	2900 U	--	61 U	--	180 U	--	--	180 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	--	8000 ^d	--	8.1 U	--	310	--	--	860 ^d
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	--	5800 U	--	120 U	--	180 U	--	--	180 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	--	2900 U	--	61 U	--	180 U	--	--	180 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	--	2900 U	--	61 U	--	180 U	--	--	180 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	--	8700 U	--	180 U	--	370 U	--	--	370 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	--	500	--	8.1 U	--	64	--	--	96
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	2000000 C,DI	--	2900 U	--	61 U	--	180 U	--	--	180 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	--	390 U	--	8.1 U	--	34 U	--	--	20 J
Pyridine	ug/kg	NA	NA	400	420	NA	37000 C	37000 C	--	5800 U	--	120 U	--	--	--	--	--
Metals																	
All Metals	ug/kg	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE
PCBs																	
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Aroclor-1232 (PCB-1232)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Aroclor-1242 (PCB-1242)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Aroclor-1248 (PCB-1248)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	240	20000 ^{pq}	38 U	40 U	51 U	43 U	47 U	40 J	44 U
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	35 U	3800 U	38 U	40 U	51 U	43 U	47 U	44 U	44 U
Total PCBs	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	258	22000 ^{pq}	38 U	40 U	--	--	--	--	--
General Chemistry																	
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	12000	250000	--	230 U	--	240 U	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	23	11	17	11	12
Total solids	%	NA	NA	NA	NA	NA	NA	NA	94.9	86.4	87.1	82.6	--	--	--	--	--

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 10

SOIL ANALYTICAL RESULTS
AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening</u> <u>Levels: Residential and Non-Residential Generic Cleanup Criteria</u> ⁽¹⁾						BH103-12	BH104-12	BH104-12	BH104-12	BH105-12	BH105-12	BH105-12	BH105-12	BH106-12	BH106-12
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	23-25 ft BGS	0-2 ft BGS	12-14 ft BGS	22-24 ft BGS	0-2 ft BGS	12-14 ft BGS	18-20 ft BGS	18-20 ft BGS	15-17 ft BGS	18-20 ft BGS	
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection												Duplicate	
Parameters	Units	a	a	b	c	d	p	q										
VOCs																		
All VOCs	ug/kg	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
SVOCs																		
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000	NA	23000000	73000000	--	--	170 U	--	--	180 U	--	--	--	--
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	170 U	--	--	180 U	--	--	--	--
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	--	--	87 U	--	--	17000 ^d	--	--	--	--
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	--	--	170 U	--	--	180 U	--	--	--	--
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	48 J	--	--	740 U	--	--	--	--
2-Nitrophenol	ug/kg	NA	NA	400	1200	ID	630000	2000000	--	--	170 U	--	--	180 U	--	--	--	--
3,3'-Dichlorobenzidine	ug/kg	NA	NA	2000 M	2000 M	2000 M	6600	30000	--	--	720 U	--	--	7400 U	--	--	--	--
3-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	720 U	--	--	740 U	--	--	--	--
Acenaphthene	ug/kg	NA	NA	300000	880000	8700	41000000	130000000	--	--	33 U	--	--	34 U	--	--	--	--
Acenaphthylene	ug/kg	NA	NA	5900	17000	ID	1600000	5200000	--	--	33 U	--	--	34 U	--	--	--	--
Acetophenone	ug/kg	NA	NA	30000	88000	ID	1100000 C	1100000 C	--	--	360 U	--	--	370 U	--	--	--	--
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	--	--	33 U	--	--	64	--	--	--	--
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	--	--	360 U	--	--	370 U	--	--	--	--
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	360 U	--	--	370 U	--	--	--	--
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	--	28 J	--	--	340 U	--	--	--	--
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	--	--	33 U	--	--	340 U	--	--	--	--
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	--	33 U	--	--	340 U	--	--	--	--
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	--	--	33 U	--	--	340 U	--	--	--	--
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	--	--	33 U	--	--	340 U	--	--	--	--
Biphenyl (1,1-Biphenyl)	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	360 U	--	--	370 U	--	--	--	--
Caprolactam	ug/kg	NA	NA	120000	340000	NA	53000000 DD	10000000 DI	--	--	360 U	--	--	370 U	--	--	--	--
Carbazole	ug/kg	NA	NA	9400	39000	1100	530000	2400000	--	--	170 U	--	--	180 U	--	--	--	--
Chrysene	ug/kg	NA	NA	NLL	NLL	NLL	2000000	8000000	--	--	51	--	--	760	--	--	--	--
Dibenz(a,h)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	--	--	33 U	--	--	340 U	--	--	--	--

TABLE 10
SOIL ANALYTICAL RESULTS
AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Sandy (shallower) soils	Clay (deeper) soils	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria</u> ⁽¹⁾						BH103-12	BH104-12	BH104-12	BH104-12	BH105-12	BH105-12	BH105-12	BH105-12	BH106-12	BH106-12
Sample Depth:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential		23-25 ft BGS	0-2 ft BGS	12-14 ft BGS	22-24 ft BGS	0-2 ft BGS	12-14 ft BGS	18-20 ft BGS	18-20 ft BGS	15-17 ft BGS	18-20 ft BGS
Sample Date:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact		08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012
Sample Type:	Value(2)	Value(2)	Protection	Protection	Interface Protection													Duplicate
Parameters	Units	a	a	b	c	d	p	q										
Dibenzofuran	ug/kg	NA	NA	ID	ID	1700	ID	ID	--	--	170 U	--	--	180 U	--	--	--	--
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	--	--	360 U	--	--	370 U	--	--	--	--
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	--	--	360 U	--	--	370 U	--	--	--	--
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	--	--	360 U	--	--	370 U	--	--	--	--
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	--	--	170 U	--	--	1800 U	--	--	--	--
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	--	--	33 U	--	--	60	--	--	--	--
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	--	--	21 J	--	--	34 U	--	--	--	--
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	--	--	170 U	--	--	180 U	--	--	--	--
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	--	--	170 U	--	--	180 U	--	--	--	--
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	--	--	33 U	--	--	340 U	--	--	--	--
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	--	--	170 U	--	--	180 U	--	--	--	--
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	--	--	33 U	--	--	4100 ^d	--	--	--	--
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	--	--	170 U	--	--	180 U	--	--	--	--
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	--	--	170 U	--	--	180 U	--	--	--	--
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	--	--	170 U	--	--	180 U	--	--	--	--
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	--	--	360 U	--	--	370 U	--	--	--	--
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	--	--	35	--	--	560	--	--	--	--
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	2000000 C,DI	--	--	170 U	--	--	180 U	--	--	--	--
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	--	--	33 U	--	--	620	--	--	--	--
Pyridine	ug/kg	NA	NA	400	420	NA	37000 C	37000 C	--	--	--	--	--	--	--	--	--	--
Metals																		
All Metals	ug/kg	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
PCBs																		
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Aroclor-1232 (PCB-1232)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Aroclor-1242 (PCB-1242)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Aroclor-1248 (PCB-1248)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	120	45 U	43 U	42 U	43 U	44 U
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	47 U	42 U	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U
Total PCBs	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	--	--	--	--	--	--	--	--	--
General Chemistry																		
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	12000	250000	--	--	--	--	--	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	NA	NA	17	7.8	14	18	10	12	10	13	11	9.4
Total solids	%	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--	--	--

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 11

GROUNDWATER ANALYTICAL RESULTS

AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS

PCC - VALIDATION

PONTIAC, MICHIGAN

Sample Location:	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>				MW88-12	MW-89-12	MW-90-12
					08/29/2012	12/06/2012	12/07/2012
		Residential Drinking Water	NonResidential Drinking Water	Groundwater Surface Water Interface			
Parameters	Units	a	b	c			
VOCs							
All VOCs	ug/L	NA	NA	NA	NE	NE	NE
SVOCs							
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L	NA	NA	NA	5.0 U	--	--
2,4,5-Trichlorophenol	ug/L	730	2100	NA	5.0 U	--	--
2,4,6-Trichlorophenol	ug/L	120	470	5	5.0 U	--	--
2,4-Dichlorophenol	ug/L	73	210	11	10 U	--	--
2,4-Dimethylphenol	ug/L	370	1000	380	5.0 U	--	--
2,4-Dinitrophenol	ug/L	NA	NA	NA	5.0 U	--	--
2,4-Dinitrotoluene	ug/L	7.7	32	NA	5.0 U	--	--
2,6-Dinitrotoluene	ug/L	NA	NA	NA	5.0 U	--	--
2-Chloronaphthalene	ug/L	1800	5200	NA	5.0 U	--	--
2-Chlorophenol	ug/L	45	130	18	5.0 U	--	--
2-Methylnaphthalene	ug/L	260	750	19	29 ^c	5.0 U	5.0 U
2-Methylphenol	ug/L	370	1000	30 M	5.0 U	--	--
2-Nitroaniline	ug/L	NA	NA	NA	20 U	--	--
2-Nitrophenol	ug/L	20	58	ID	5.0 U	--	--
3,3'-Dichlorobenzidine	ug/L	1.1	4.3	0.3 M	5.0 U	--	--
3-Nitroaniline	ug/L	NA	NA	NA	20 U	--	--
4,6-Dinitro-2-methylphenol	ug/L	20 M	20 M	NA	20 U	--	--
4-Bromophenyl phenyl ether	ug/L	NA	NA	NA	5.0 U	--	--
4-Chloro-3-methylphenol	ug/L	150	420	7.4	5.0 U	--	--
4-Chloroaniline	ug/L	NA	NA	NA	20 U	--	--
4-Chlorophenyl phenyl ether	ug/L	NA	NA	NA	5.0 U	--	--
4-Methylphenol	ug/L	370	1000	30 M	5.0 U	--	--
4-Nitroaniline	ug/L	NA	NA	NA	20 U	--	--
4-Nitrophenol	ug/L	NA	NA	NA	20 U	--	--
Acenaphthene	ug/L	1300	3800	38	5.0 U	5.0 U	5.0 U
Acenaphthylene	ug/L	52	150	ID	5.0 U	5.0 U	5.0 U
Acetophenone	ug/L	1500	4400	NA	1.0 U	--	--
Anthracene	ug/L	43 S	43 S	ID	5.0 U	5.0 U	5.0 U
Atrazine	ug/L	3 A	3 A	7.3	10 U	--	--

TABLE 11

GROUNDWATER ANALYTICAL RESULTS

AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS

PCC - VALIDATION

PONTIAC, MICHIGAN

		<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>			MW88-12	MW-89-12	MW-90-12
<i>Sample Location:</i>					08/29/2012	12/06/2012	12/07/2012
<i>Sample Date:</i>							
<i>Sample Type:</i>		<i>Residential</i>	<i>NonResidential</i>	<i>Groundwater Surface Water</i>			
		<i>Drinking Water</i>	<i>Drinking Water</i>	<i>Interface</i>			
<i>Parameters</i>	<i>Units</i>	<i>a</i>	<i>b</i>	<i>c</i>			
Benzaldehyde	ug/L	NA	NA	NA	1.0 U	--	--
Benzo(a)anthracene	ug/L	2.1	8.5	ID	5.0 U	1.0 U	1.0 U
Benzo(a)pyrene	ug/L	5 A	5 A	ID	5.0 U	1.0 U	0.58 J
Benzo(b)fluoranthene	ug/L	1.5 S,AA	1.5 S,AA	ID	5.0 U	1.0 U	0.75 J
Benzo(g,h,i)perylene	ug/L	1 M	1 M	NA	5.0 U	1.0 U	1.0 U
Benzo(k)fluoranthene	ug/L	1 M	1 M	NA	5.0 U	1.0 U	1.0 U
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	2.2 J	--	--
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	5.0 U	--	--
bis(2-Chloroethyl)ether	ug/L	2	8.3	1 M	5.0 U	--	--
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6 A	6 A	25	5.0 U	--	--
Butyl benzylphthalate (BBP)	ug/L	1200	2700 S	67 X	5.0 U	--	--
Caprolactam	ug/L	5800	17000	NA	10 U	--	--
Carbazole	ug/L	85	350	10 M	10 U	--	--
Chrysene	ug/L	1.6 S	1.6 S	ID	5.0 U	1.0 U	1.0 U
Dibenz(a,h)anthracene	ug/L	2 M	2 M	ID	5.0 U	2.0 U	2.0 U
Dibenzofuran	ug/L	ID	ID	4	5.0 U	--	--
Diethyl phthalate	ug/L	5500	16000	110	1.4 J	--	--
Dimethyl phthalate	ug/L	73000	210000	NA	20 U	--	--
Di-n-butylphthalate (DBP)	ug/L	880	2500	9.7	5.0 U	--	--
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	5.0 U	--	--
Fluoranthene	ug/L	210 S	210 S	1.6	5.0 U	1.0 U	1.2
Fluorene	ug/L	880	2000 S	12	5.0 U	5.0 U	5.0 U
Hexachlorobenzene	ug/L	1 A	1 A	0.2 M	5.0 U	--	--
Hexachlorobutadiene	ug/L	15	42	0.053	5.0 U	--	--
Hexachlorocyclopentadiene	ug/L	50 A	50 A	ID	20 U	--	--
Hexachloroethane	ug/L	7.3	21	6.7 X	5.0 U	--	--
Indeno(1,2,3-cd)pyrene	ug/L	2 M	2 M	ID	5.0 U	5.0 U	5.0 U
Isophorone	ug/L	770	3100	1300 X	5.0 U	--	--
Naphthalene	ug/L	520	1500	11	24 ^c	5.0 U	5.0 U
Nitrobenzene	ug/L	3.4	9.6	180 X	5.0 U	--	--
N-Nitrosodi-n-propylamine	ug/L	5 M	5 M	NA	5.0 U	--	--
N-Nitrosodiphenylamine	ug/L	270	1100	NA	5.0 U	--	--
Pentachlorophenol	ug/L	1 A	1 A	G,X	20 U	--	--
Phenanthrene	ug/L	52	150	2 M	5.0 U	2.0 U	2.0 U
Phenol	ug/L	4400	13000	450	5.0 U	--	--
Pyrene	ug/L	140 S	140 S	ID	5.0 U	5.0 U	1.2 J

TABLE 11

GROUNDWATER ANALYTICAL RESULTS

AOI 20 AND 22 - FORMER TRANSFORMERS, SUBSTATIONS, AND LARGE COPACITORS AND PAINT MIX ROOMS

PCC - VALIDATION

PONTIAC, MICHIGAN

Sample Location: Sample Date: Sample Type:	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>				MW88-12	MW-89-12	MW-90-12
					08/29/2012	12/06/2012	12/07/2012
		Residential Drinking Water	NonResidential Drinking Water	Groundwater Surface Water Interface			
Parameters	Units	a	b	c			
Metals							
Aluminum	ug/L	50 V	50 V	NA	43	--	--
Antimony	ug/L	6 A	6 A	130 X	0.098 J	--	--
Arsenic	ug/L	10 A	10 A	10	12 ^{abc}	--	--
Barium	ug/L	2000 A	2000 A	G	85	--	--
Beryllium	ug/L	4 A	4 A	G	0.002 U	--	--
Cadmium	ug/L	5 A	5 A	G,X	0.11 J	--	--
Chromium	ug/L	100 A	100 A	11	0.005 U	--	--
Cobalt	ug/L	40	100	100	1.5 J	--	--
Copper	ug/L	1000 E	1000 E	G	2.1 J	--	--
Iron	ug/L	300 E	300 E	NA	2600 ^{ab}	--	--
Lead	ug/L	4 L	4 L	G,X	0.11 J	--	--
Manganese	ug/L	50 E	50 E	G,X	93 ^{ab}	--	--
Mercury	ug/L	2 A	2 A	0.0013	0.2 U	--	--
Nickel	ug/L	100 A	100 A	G	11	--	--
Selenium	ug/L	50 A	50 A	5	0.005 U	--	--
Silver	ug/L	34	98	0.2 M	5 U	--	--
Thallium	ug/L	2 A	2 A	3.7 X	0.36 J	--	--
Vanadium	ug/L	4.5	62	27	5 U	--	--
Zinc	ug/L	2400	5000 E	G	0.01 U	--	--
PCBs							
All PCBs	ug/L	NA	NA	NA	NE	-	-

Notes:

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

J The associated value is qualified as an estimated quantity.

UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.

NA - Criteria not available or not applicable

NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 12

GROUNDWATER ANALYTICAL RESULTS
AOI 26 - RELEASES TO SEWERS
PCC - VALIDATION
PONTIAC, MICHIGAN

<i>Sample Location:</i>		<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria (1)</u>				MW82-12	MW83-12
<i>Sample Date:</i>						08/30/2012	08/29/2012
<i>Sample Type:</i>		<i>Residential Drinking Water</i>	<i>NonResidential Drinking Water</i>	<i>Groundwater Surface Water Interface</i>	<i>Acute Inhalation Screening Level</i>		
<i>Parameters</i>	<i>Units</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>i</i>		
VOCs							
All VOCs	ug/L	NA	NA	NA	NA	NE	NE
SVOCs							
All SVOCs	ug/L	NA	NA	NA	NA	NE	NE
Metals							
Aluminum	ug/L	50 V	50 V	NA	ID	22000 ^{ab}	120 ^{ab}
Antimony	ug/L	6 A	6 A	130 X	ID	2.5 J	1.1 J
Arsenic	ug/L	10 A	10 A	10	ID	41 ^{abc}	6.6
Barium	ug/L	2000 A	2000 A	G	ID	140	25
Beryllium	ug/L	4 A	4 A	G	ID	20 U	0.12 J
Cadmium	ug/L	5 A	5 A	G,X	ID	0.72 J	0.12 J
Calcium	ug/L	NA	NA	NA	NA	--	--
Chromium	ug/L	100 A	100 A	11	ID	34 ^c	0.96 J
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	ID	--	--
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	ID	--	--
Cobalt	ug/L	40	100	100	ID	20 J	0.62 J
Copper	ug/L	1000 E	1000 E	G	ID	83	3.4 J
Iron	ug/L	300 E	300 E	NA	ID	32000 ^{ab}	130
Lead	ug/L	4 L	4 L	G,X	ID	25 J ^{ab}	0.9 J
Magnesium	ug/L	400000	1100000	NA	ID	--	--
Manganese	ug/L	50 E	50 E	G,X	ID	490 ^{ab}	19
Mercury	ug/L	2 A	2 A	0.0013	ID	0.073 J ^c	0.2 U
Nickel	ug/L	100 A	100 A	G	ID	54	5.2
Potassium	ug/L	NA	NA	NA	NA	--	--
Selenium	ug/L	50 A	50 A	5	ID	12 J ^c	0.96 J
Silver	ug/L	34	98	0.2 M	ID	0.18 J	5 U
Sodium	ug/L	120000	350000	NA	ID	--	--
Thallium	ug/L	2 A	2 A	3.7 X	ID	50 U	0.27 J
Vanadium	ug/L	4.5	62	27	ID	89 ^{abc}	0.67 J
Zinc	ug/L	2400	5000 E	G	ID	130	4.6 J
PCBs							
All PCBs	ug/L	NA	NA	NA	NA	NE	NE

Notes:
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 13

SOIL ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

		<i>Sandy (shallower) soils</i>	<i>Clay (deeper) soils</i>	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾</u>			<i>MW68-08 10-12 ft BGS 03/12/2008</i>	<i>MW69-08 12-14 ft BGS 03/12/2008</i>	<i>MW69-08 18-20 ft BGS 03/12/2008</i>	<i>TMW-70-08 4-6 ft BGS 03/05/2008</i>	<i>MW85-12 1-3 ft BGS 08/23/2012</i>	<i>MW85-12 3-5 ft BGS 08/23/2012</i>	<i>MW87-12 1-3 ft BGS 08/23/2012</i>	<i>MW87-12 1-3 ft BGS 08/23/2012</i>	<i>MW87-12 3-5 ft BGS 08/23/2012</i>	<i>BH112-12 16 ft BGS 12/05/2012</i>	<i>BH112-12 5.5 ft BGS 12/05/2012</i>	<i>BH113-12 17 ft BGS 12/05/2012</i>
<i>Sample Location:</i>																		
<i>Sample Depth:</i>		<i>Selected</i>	<i>Selected</i>	<i>Residential</i>	<i>Non-Residential</i>	<i>Groundwater</i>												
<i>Sample Date:</i>		<i>Background</i>	<i>Background</i>	<i>Drinking Water</i>	<i>Drinking Water</i>	<i>Surface Water</i>												
<i>Sample Type:</i>		<i>Value(2)</i>	<i>Value(2)</i>	<i>Protection</i>	<i>Protection</i>	<i>Interface Protection</i>								<i>Duplicate</i>				
<i>Parameters</i>	<i>Units</i>	<i>a</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>												
VOCs																		
1,1,1-Trichloroethane	ug/kg	NA	NA	4000	4000	1800	4.4 U	3.5 UJ	91 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,1,2,2-Tetrachloroethane	ug/kg	NA	NA	170	700	1600 X	4.4 U	R	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,1,2-Trichloroethane	ug/kg	NA	NA	100	100	6600 X	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,1-Dichloroethane	ug/kg	NA	NA	18000	50000	15000	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,1-Dichloroethene	ug/kg	NA	NA	140	140	2600	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2,4-Trichlorobenzene	ug/kg	NA	NA	4200	4200	5900 X	4.4 U	3.5 UJ	450 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2,4-Trimethylbenzene	ug/kg	NA	NA	2100	2100	570	4.4 U	R	180 U	4.9 U	--	--	--	--	--	--	--	--
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg	NA	NA	10 M	10 M	ID	8.8 U	R	450 U	9.7 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg	NA	NA	20 M	20 M	110 X	4.4 U	3.5 UJ	450 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2-Dichlorobenzene	ug/kg	NA	NA	14000	14000	280	4.4 U	0.31 J	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2-Dichloroethane	ug/kg	NA	NA	100	100	7200 X	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,2-Dichloropropane	ug/kg	NA	NA	100	100	4600 X	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,3,5-Trimethylbenzene	ug/kg	NA	NA	1800	1800	1100	4.4 U	R	180 U	4.9 U	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	ug/kg	NA	NA	170	480	680	4.4 U	0.40 J	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
1,4-Dichlorobenzene	ug/kg	NA	NA	1700	1700	360	4.4 U	0.47 J	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg	NA	NA	260000	760000	44000	18 U	14 UJ	1400 UJ	19 U	180 J	150 J	190 J	180 J	150 J	230 U	420 U	250 U
2-Hexanone	ug/kg	NA	NA	20000	58000	ID	18 U	14 UJ	4500 U	19 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg	NA	NA	36000	100000	ID	18 U	14 UJ	4500 U	19 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Acetone	ug/kg	NA	NA	15000	42000	34000	18 U	14 UJ	1400 UJ	19 UJ	310 B	250 B	350 B	330 B	300 B	110 U	210 U	120 U
Benzene	ug/kg	NA	NA	100	100	4000 X	4.4 U	3.5 UJ	91 U	0.32 J	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Bromodichloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.4 U	3.5 UJ	180 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Bromoform	ug/kg	NA	NA	1600 W	1600 W	ID	4.4 U	3.5 UJ	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Bromomethane (Methyl bromide)	ug/kg	NA	NA	200	580	700	4.4 U	3.5 UJ	450 U	R	89 U	82 U	85 U	84 U	83 U	86 U	160 U	93 U
Carbon disulfide	ug/kg	NA	NA	16000	46000	ID	4.4 U	0.55 J	450 U	0.78 J	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Carbon tetrachloride	ug/kg	NA	NA	100	100	900 X	4.4 U	3.5 UJ	91 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Chlorobenzene	ug/kg	NA	NA	2000	2000	500	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Chloroethane	ug/kg	NA	NA	8600	34000	22000 X	4.4 U	3.5 UJ	450 UJ	R	120 U	110 U	110 U	110 U	110 U	110 U	210 U	120 U
Chloroform (Trichloromethane)	ug/kg	NA	NA	1600 W	1600 W	7000	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Chloromethane (Methyl chloride)	ug/kg	NA	NA	5200	22000	ID	4.4 U	3.5 UJ	450 UJ	4.9 U	150	180	220	210	190	110 U	210 U	120 U

TABLE 13

SOIL ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location: Sample Depth: Sample Date: Sample Type:	Sandy (shallower) soils	Clay (deeper) soils	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria</u> ⁽¹⁾			MW68-08	MW69-08	MW69-08	TMW-70-08	MW85-12	MW85-12	MW87-12	MW87-12	MW87-12	MW87-12	BH112-12	BH112-12	BH113-12
	Selected	Selected	Residential	Non-Residential	Groundwater	10-12 ft BGS	12-14 ft BGS	18-20 ft BGS	4-6 ft BGS	1-3 ft BGS	3-5 ft BGS	1-3 ft BGS	1-3 ft BGS	3-5 ft BGS	3-5 ft BGS	16 ft BGS	5.5 ft BGS	17 ft BGS
	Background	Background	Drinking Water	Drinking Water	Surface Water	03/12/2008	03/12/2008	03/12/2008	03/05/2008	08/23/2012	08/23/2012	08/23/2012	08/23/2012	08/23/2012	08/23/2012	12/05/2012	12/05/2012	12/05/2012
	Value(2)	Value(2)	Protection	Protection	Interface Protection										Duplicate			
	Units	a	a	b	c	d												
cis-1,2-Dichloroethene	ug/kg	NA	NA	1400	1400	12000	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
cis-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.4 U	3.5 UJ	91 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.8 U	6.9 UJ	2200 UJ	0.67 J	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Dibromochloromethane	ug/kg	NA	NA	1600 W	1600 W	ID	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Dichlorodifluoromethane (CFC-12)	ug/kg	NA	NA	95000	270000	ID	4.4 U	3.5 UJ	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Ethylbenzene	ug/kg	NA	NA	1500	1500	360	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Isopropyl benzene	ug/kg	NA	NA	91000	260000	3200	4.4 U	3.5 UJ	170 J	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	8.8 U	6.9 UJ	320 J	1.7 J	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	18 U	14 UJ	450 U	19 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	4.4 U	3.5 UJ	450 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Styrene	ug/kg	NA	NA	2700	2700	2100 X	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	4.4 U	3.5 UJ	74 J	4.9 U	260 ^{bc}	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Toluene	ug/kg	NA	NA	16000	16000	5400	4.4 U	3.5 UJ	180 U	0.57 J	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	4.4 U	3.5 UJ	91 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
trans-1,3-Dichloropropene	ug/kg	NA	NA	NA	NA	NA	4.4 U	3.5 UJ	91 UJ	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Trichloroethene	ug/kg	NA	NA	100	100	4000 X	4.4 U	3.5 UJ	59 J	82	36 U	33 U	34 U	34 U	33 U	330 ^{bc}	63 U	37 U
Trichlorofluoromethane (CFC-11)	ug/kg	NA	NA	52000	150000	NA	4.4 U	3.5 UJ	180 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Trifluorotrichloroethane (Freon 113)	ug/kg	NA	NA	550000 C	550000 C	1700	4.4 U	3.5 UJ	450 U	R	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Vinyl chloride	ug/kg	NA	NA	40	40	260 X	4.4 U	3.5 UJ	73 U	4.9 U	36 U	33 U	34 U	34 U	33 U	34 U	63 U	37 U
Xylenes (total)	ug/kg	NA	NA	5600	5600	820	8.8 U	6.9 UJ	270 U	9.7 U	110 U	98 U	100 U	100 U	100 U	100 U	190 U	110 U
Metals																		
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	6190000	5720000	1930000	2740000	4200000	2700000	6100000	6700000	4400000	5100000	17000000 ^{abc}	3600000
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	72 J	70 J	42 J	R	170 J	110 J	120 J	130 J	140 J	93 J	52 J	110 J
Arsenic	ug/kg	7020	9610	4600	4600	4600	3800 J	3300 J	2200	4400 J	2700	2900	4200	3500	3800	3000	6100	2100
Barium	ug/kg	240000	79700	1300000	1300000	G	38700	28200	6400	19600	19000	17000	46000	57000	31000	29000	73000	17000
Beryllium	ug/kg	584	600	51000	51000	G	440 U	410 U	180 U	210	160 J	170 J	400 J	400 J	270 J	300 J	860	150 J
Cadmium	ug/kg	549	673	6000	6000	G,X	170 U	150 U	82 J	270	150 J	120 J	110 J	130 J	120 J	110 J	96 J	77 J
Calcium	ug/kg	NA	NA	NA	NA	NA	63200000	77200000	53300000	72100000	--	--	--	--	--	--	--	--
Chromium	ug/kg	NA	NA	NA	NA	NA	10200	9700	5200	8000	5500	5700	12000	12000	9200	10000	21000 ^{ad}	7100
Chromium III (trivalent)	ug/kg	NA	NA	NA	NA	NA	10200	9700	5200	7400	--	--	--	--	--	--	--	--
Chromium VI (hexavalent)	ug/kg	NA	NA	NA	NA	NA	900 U	890 U	910 U	680 J	--	--	--	--	--	--	--	--

TABLE 13

SOIL ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

		<i>Sandy (shallower) soils</i>	<i>Clay (deeper) soils</i>	<u>Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria</u> ⁽¹⁾			<i>MW68-08 10-12 ft BGS 03/12/2008</i>	<i>MW69-08 12-14 ft BGS 03/12/2008</i>	<i>MW69-08 18-20 ft BGS 03/12/2008</i>	<i>TMW-70-08 4-6 ft BGS 03/05/2008</i>	<i>MW85-12 1-3 ft BGS 08/23/2012</i>	<i>MW85-12 3-5 ft BGS 08/23/2012</i>	<i>MW87-12 1-3 ft BGS 08/23/2012</i>	<i>MW87-12 1-3 ft BGS 08/23/2012</i>	<i>MW87-12 3-5 ft BGS 08/23/2012</i>	<i>BH112-12 16 ft BGS 12/05/2012</i>	<i>BH112-12 5.5 ft BGS 12/05/2012</i>	<i>BH113-12 17 ft BGS 12/05/2012</i>
<i>Sample Location:</i>																		
<i>Sample Depth:</i>		<i>Selected</i>	<i>Selected</i>	<i>Residential</i>	<i>Non-Residential</i>	<i>Groundwater</i>												
<i>Sample Date:</i>		<i>Background</i>	<i>Background</i>	<i>Drinking Water</i>	<i>Drinking Water</i>	<i>Surface Water</i>												
<i>Sample Type:</i>		<i>Value(2)</i>	<i>Value(2)</i>	<i>Protection</i>	<i>Protection</i>	<i>Interface Protection</i>								<i>Duplicate</i>				
<i>Parameters</i>	<i>Units</i>	<i>a</i>	<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>												
Cobalt	ug/kg	NA	NA	NA	NA	NA	6000	6200	2400	3300	5300	3400	6200	6400	5000	4800	8500	2700
Copper	ug/kg	NA	NA	NA	NA	NA	17500	15500	8800	13500	12000	9500	12000	12000	15000	12000	16000	11000
Iron	ug/kg	NA	NA	NA	NA	NA	12400000	11800000	5300000	8640000	6700000	7800000	14000000	14000000	11000000	11000000	26000000 ^{abc}	11000000
Lead	ug/kg	NA	NA	NA	NA	NA	6400	5600	3000	4200	7200	5400	7000	7300	10000	6600	11000	5600
Magnesium	ug/kg	20900000	28300000	8000000	22000000	NA	9690000	15300000	11500000	10700000	--	--	--	--	--	--	--	--
Manganese	ug/kg	4560000	677000	1000	1000	G, X	331000	356000	151000	263000	200000	380000	460000	480000	360000	390000	280000	320000
Mercury	ug/kg	54.1	52 U	1700	1700	50 M	45 U	18 J	45 U	49 U	41	14 J	13 J	15 J	14 J	23	95	22
Nickel	ug/kg	20000	31300	100000	100000	G	15800	16300	5700	9900 J	6100	8900	16000	15000	11000	13000	23000	7500
Potassium	ug/kg	1280000	2660000	NA	NA	NA	1210000	1280000	392000 J	569000	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400	430 J	430 J	300	580 J	220 J	300 J	430	340 J	610	830	1600 ^{ad}	740
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M	90 U	26 J	91 U	2100 J ^{ad}	350 J	11 J	18 J	15 J	18 J	16 J	17 J	26 J
Sodium	ug/kg	1060000	1640000	2500000	7000000	NA	106000	86600 J	87900 J	123000	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X	160	240	91 U	130	88 J	230 J	270 J	280 J	250 J	190 J	230 J	83 J
Vanadium	ug/kg	30800	23800	72000	990000	430000	14700	13800	7800	9100	9000	9500	17000	18000	15000	13000	30000	11000
Zinc	ug/kg	56300	64100	2400000	5000000	G	33800 J	31900 J	19700	22000 J	21000	22000	30000	39000	27000	27000	44000	21000
<i>PCBs</i>																		
All PCBs	ug/kg	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<i>General Chemistry</i>																		
Cyanide (total)	ug/kg	NA	NA	4000	4000	100	230 U	220 U	230 U	240 U	--	--	--	--	--	--	--	--
Moisture content (dry weight)	%	NA	NA	NA	NA	NA	--	--	--	--	12	8.1	11	10	9.8	13	18	16
Total solids	%	NA	NA	NA	NA	NA	88.7	89.9	88.2	82.4	--	--	--	--	--	--	--	--

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.

NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 14
GROUNDWATER ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:		Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria																		
Sample Date:									MW64-08	MW64-08	MW68-08	MW68-08	MW74-08	MW74-08	MW84-12	MW84-12	MW85-12	MW87-12		
Sample Type:		Residential	NonResidential	Groundwater Surface	Groundwater Volatilization	Groundwater Volatilization	Groundwater	Water	04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	08/28/2012	08/30/2012	08/30/2012	08/29/2012	08/30/2012		
		Drinking Water	Drinking Water	Water Interface	IndoorAir Inhalation	IndoorAir Inhalation	Contact	Solubility											Duplicate	
Parameters	Units	a	b	c	d	e	f	g												
VOCs																				
1,1,1-Trichloroethane	ug/L	200 A	200 A	89	660000	1300000 S	1300000 S	1330000	1.0 U	1.0 U	1.0 U	1.0 U	1000 ^{abc}	750 ^{abc}	1.0 U	1.0 U	1.0 U	1.0 U		
1,1,2,2-Tetrachloroethane	ug/L	8.5	35	78 X	12000	77000	4700	2970000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,1,2-Trichloroethane	ug/L	5 A	5 A	330 X	17000	110000	21000	4420000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,1-Dichloroethane	ug/L	880	2500	740	1000000	2300000	2400000	5060000	1.0 U	1.0 U	1.0 U	1.0 U	230	54	1.0 U	1.0 U	1.0 U	1.0 U		
1,1-Dichloroethene	ug/L	7 A	7 A	130	200	1300	11000	2250000	1.0 U	1.0 U	1.0 U	1.0 U	57 J ^{ab}	18 ^{ab}	1.0 U	1.0 U	1.0 U	1.0 U		
1,2,4-Trichlorobenzene	ug/L	70 A	70 A	99 X	300000 S	300000 S	19000	300000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
1,2,4-Trimethylbenzene	ug/L	63 E	63 E	17	56000 S	56000 S	56000 S	55890	1.0 U	--	1.0 U	--	77 U	--	--	--	--	--		
1,2-Dichlorobenzene	ug/L	600 A	600 A	13	160000 S	160000 S	160000 S	156000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,2-Dichloroethane	ug/L	5 A	5 A	360 X	9600	59000	19000	8520000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,2-Dichloropropane	ug/L	5 A	5 A	230 X	16000	36000	16000	2800000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,3,5-Trimethylbenzene	ug/L	72 E	72 E	45	61000 S	61000 S	61000 S	61150	1.0 U	--	1.0 U	--	77 U	--	--	--	--	--		
1,3-Dichlorobenzene	ug/L	6.6	19	28	18000	41000	2000	111000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
1,4-Dichlorobenzene	ug/L	75 A	75 A	17	16000	74000 S	6400	73800	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	13000	38000	2200	240000000 S	240000000 S	240000000 S	240000000	25 U	25 U	25 U	25 U	1900 U	120 U	25 U	25 U	25 U	25 U		
2-Hexanone	ug/L	1000	2900	ID	4200000	8700000	5200000	16000000	50 U	50 U	50 U	50 U	3800 U	250 U	50 U	50 U	50 U	50 U		
Acetone	ug/L	730	2100	1700	1000000000 D,S	1000000000 D,S	31000000	1000000000	25 UJ	50 U	25 UJ	50 U	1900 UJ	250 U	50 U	50 U	50 U	50 U		
Benzene	ug/L	5 A	5 A	200 X	5600	35000	11000	1750000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Bromodichloromethane	ug/L	80 A,W	80 A,W	ID	4800	37000	14000	6740000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Bromoform	ug/L	80 A,W	80 A,W	ID	470000	3100000 S	140000	3100000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Bromomethane (Methyl bromide)	ug/L	10	29	35	4000	9000	70000	14500000	1.0 U	5.0 U	1.0 U	5.0 U	77 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Carbon disulfide	ug/L	800	2300	ID	250000	550000	1200000 S	1190000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Chloroform (Trichloromethane)	ug/L	80 A,W	80 A,W	350	28000	180000	150000	7920000	1.0 U	1.0 U	0.23 J	1.0 U	17 J	7.2	1.0 U	1.0 U	12	1.0 U		
Chloromethane (Methyl chloride)	ug/L	260	1100	ID	8600	45000	490000	6340000	1.0 UJ	5.0 U	1.0 UJ	5.0 U	77 UJ	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
cis-1,2-Dichloroethene	ug/L	70 A	70 A	620	93000	210000	200000	3500000	1.0 U	1.0 U	1.0 U	1.0 U	76 J ^{ab}	26	5.2	5.2	1.0 U	1.0 U		
Dibromochloromethane	ug/L	80 A,W	80 A,W	ID	14000	110000	18000	2600000	1.0 U	5.0 U	1.0 U	5.0 U	77 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Dichlorodifluoromethane (CFC-12)	ug/L	1700	4800	ID	220000	300000 S	300000 S	300000	1.0 U	5.0 U	1.0 U	5.0 U	77 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Ethylbenzene	ug/L	74 E	74 E	18	110000	170000 S	170000 S	169000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Isopropyl benzene	ug/L	800	2300	28	56000 S	56000 S	56000 S	56000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Methyl tert butyl ether (MTBE)	ug/L	40 E	40 E	7100 X	47000000 S	47000000 S	610000	46800000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Methylene chloride	ug/L	5 A	5 A	1500 X	220000	1400000	220000	17000000	5.0 U	5.0 U	5.0 U	5.0 U	380 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U		
Styrene	ug/L	100 A	100 A	80	170000	310000 S	9700	310000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Tetrachloroethene	ug/L	5 A	5 A	60 X	25000	170000	12000	200000	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Toluene	ug/L	790 E	790 E	270	530000 S	530000 S	530000 S	526000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
trans-1,2-Dichloroethene	ug/L	100 A	100 A	1500 X	85000	200000	220000	6300000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.3	1.0 U	1.0 U		
trans-1,3-Dichloropropene	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Trichloroethene	ug/L	5 A	5 A	200 X	2200	4900	22000	1100000	1.0 U	1.0 U	1.0 U	1.0 U	2100 ^{abc}	2100 ^{abc}	4.3	4.4	1.0 U	1.0 U		
Trichlorofluoromethane (CFC-11)	ug/L	2600	7300	NA	1100000 S	1100000 S	1100000 S	1100000	1.0 UJ	1.0 U	1.0 UJ	1.0 U	77 UJ	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Trifluorotrichloroethane (Freon 113)	ug/L	170000 S	170000 S	32	170000 S	170000 S	170000 S	170000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Vinyl chloride	ug/L	2 A	2 A	13 X	1100	13000	1000	2760000	1.0 U	1.0 U	1.0 U	1.0 U	77 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U		
Xylenes (total)	ug/L	280 E	280 E	41	190000 S	190000 S	190000 S	186000	2.0 U	3.0 U	2.0 U	3.0 U	150 U	15 U	3.0 U	3.0 U	3.0 U	3.0 U		

TABLE 14
GROUNDWATER ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criter																	
Sample Date:																		
Sample Type:																		
		Residential		Non-Residential		Groundwater		Groundwater		Groundwater		Water						
		Drinking Water		Drinking Water		Surface Water Interface		Volatilization IndoorAir Inhalation		Volatilization IndoorAir Inhalation		Contact		Solubility				
Parameters	Units	a	b	c	d	e	f	g	MW64-08 04/07/2008	MW64-08 08/28/2012	MW68-08 04/07/2008	MW68-08 08/28/2012	MW74-08 04/07/2008	MW74-08 08/28/2012	MW84-12 08/30/2012	MW84-12 08/30/2012	MW85-12 08/29/2012	MW87-12 08/30/2012
SVOCs																		
2,4,5-Trichlorophenol	ug/L	730	2100	NA	NLV	NLV	170000	1200000	5.0 U	5.0 U	5.0 U	5.0 U	9.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,6-Trichlorophenol	ug/L	120	470	5	NLV	NLV	10000	800000	4.0 U	5.0 U	4.0 U	5.0 U	7.2 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	ug/L	73	210	11	NLV	NLV	48000	4500000	2.0 U	10 U	2.0 U	10 U	3.6 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	ug/L	370	1000	380	NLV	NLV	520000	7870000	2.0 U	5.0 U	2.0 U	5.0 U	3.6 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylnaphthalene	ug/L	260	750	19	25000	25000	25000 S	24600	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA	NA	2.0 U	20 U	2.0 U	20 U	3.6 U	20 U	20 U	20 U	20 U	20 U
2-Nitrophenol	ug/L	20	58	ID	NLV	NLV	79000	2500000	2.0 U	5.0 U	2.0 U	5.0 U	3.6 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3,3'-Dichlorobenzidine	ug/L	1.1	4.3	0.3 M	NLV	NLV	180	3110	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA	NA	2.0 U	20 U	2.0 U	20 U	3.6 U	20 U	20 U	20 U	20 U	20 U
4-Methylphenol	ug/L	370	1000	30 M	NLV	NLV	810000	28000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Nitroaniline	ug/L	NA	NA	NA	NA	NA	NA	NA	2.0 U	20 U	2.0 U	20 U	3.6 U	20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	ug/L	NA	NA	NA	NA	NA	NA	NA	5.0 U	20 U	5.0 U	20 U	9.0 U	20 U	20 U	20 U	20 U	20 U
Acenaphthene	ug/L	1300	3800	38	4200 S	4200 S	4200 S	4240	0.20 U	5.0 U	0.20 U	5.0 U	0.66	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthylene	ug/L	52	150	ID	3900 S	3900 S	3900 S	3930	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetophenone	ug/L	1500	4400	NA	6100000 S	6100000 S	6100000 S	6100000	1.0 U	1.0 U	1.0 U	1.0 U	1.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	ug/L	43 S	43 S	ID	43 S	43 S	43 S	43.4	0.20 U	5.0 U	0.20 U	5.0 U	1.3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Atrazine	ug/L	3 A	3 A	7.3	NLV	NLV	5400	70000	1.0 U	10 U	1.0 U	10 U	1.8 U	10 U	10 U	10 U	10 U	10 U
Benzaldehyde	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	1.0 U	1.0 U	1.0 U	1.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Benzo(a)anthracene	ug/L	2.1	8.5	ID	NLV	NLV	9.4 S,AA	9.4	0.20 U	5.0 U	0.35	5.0 U	3.4 ^a	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(a)pyrene	ug/L	5 A	5 A	ID	NLV	NLV	1 M,AA	1.62	0.20 U	5.0 U	0.30	5.0 U	3.3 ^f g	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(b)fluoranthene	ug/L	1.5 S,AA	1.5 S,AA	ID	ID	ID	1.5 S,AA	1.5	0.20 U	5.0 U	0.35	5.0 U	4.1 ^a bfg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(g,h,i)perylene	ug/L	1 M	1 M	NA	NLV	NLV	1 M	0.26	0.20 U	5.0 U	0.20 U	5.0 U	2.2 ^a bfg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Benzo(k)fluoranthene	ug/L	1 M	1 M	NA	NLV	NLV	1 M,AA	0.8	0.20 U	5.0 U	0.20 U	5.0 U	1.7 ^a bfg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	NA	NA	NA	NA	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-Chloroethyl)ether	ug/L	2	8.3	1 M	38000	210000	5700	17200000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	6 A	6 A	25	NLV	NLV	320 AA	340	1.0 U	5.0 U	0.97 J	5.0 U	0.90 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Butyl benzylphthalate (BBP)	ug/L	1200	2700 S	67 X	NLV	NLV	2700 S	2690	1.0 U	5.0 U	1.0 U	0.60 J	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Caprolactam	ug/L	5800	17000	NA	NLV	NLV	390000000	5250000000	5.0 UJ	10 U	5.0 UJ	10 U	9.0 UJ	10 U	10 U	10 U	10 U	10 U
Carbazole	ug/L	85	350	10 M	NLV	NLV	7400	7480	1.0 U	10 U	1.0 U	10 U	0.97 J	10 U	10 U	10 U	10 U	10 U
Chrysene	ug/L	1.6 S	1.6 S	ID	ID	ID	1.6 S,AA	1.6	0.20 U	5.0 U	0.32	5.0 U	3.3 ^a bfg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenz(a,h)anthracene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	2.49	0.20 U	5.0 U	0.20 U	5.0 U	0.61	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenzofuran	ug/L	ID	ID	4	10000	10000	ID	10000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Diethyl phthalate	ug/L	5500	16000	110	NLV	NLV	1100000 S	1080000	1.0 U	20 U	1.0 U	20 U	1.8 U	20 U	20 U	20 U	20 U	20 U
Dimethyl phthalate	ug/L	73000	210000	NA	NLV	NLV	4200000 S	4190000	1.0 U	20 U	1.0 U	20 U	1.8 U	20 U	20 U	20 U	20 U	20 U
Di-n-butylphthalate (DBP)	ug/L	880	2500	9.7	NLV	NLV	11000 S	11200	1.0 U	5.0 U	1.0 U	5.0 U	0.73 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Di-n-octyl phthalate (DnOP)	ug/L	130	380	ID	NLV	NLV	400	3000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Fluoranthene	ug/L	210 S	210 S	1.6	210 S	210 S	210 S	206	0.20 U	5.0 U	0.74	5.0 U	8.4 ^c	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Fluorene	ug/L	880	2000 S	12	2000 S	2000 S	2000 S	1980	0.20 U	5.0 U	0.20 U	5.0 U	0.72	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachloroethane	ug/L	7.3	21	6.7 X	27000	50000 S	1900	50000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Indeno(1,2,3-cd)pyrene	ug/L	2 M	2 M	ID	NLV	NLV	2 M,AA	0.022	0.20 U	5.0 U	0.20 U	5.0 U	2.0 ^g	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Isophorone	ug/L	770	3100	1300 X	NLV	NLV	990000	12000000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	520	1500	11	31000 S	31000 S	31000 S	31000	0.20 U	5.0 U	0.20 U	5.0 U	0.36 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Nitrobenzene	ug/L	3.4	9.6	180 X	280000	550000	11000	2090000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pentachlorophenol	ug/L	1 A	1 A	G,X	NLV	NLV	200	1850000	5.0 U	20 U	5.0 U	20 U	9.0 U	20 U	20 U	20 U	20 U	20 U
Phenanthrene	ug/L	52	150	2 M	1000 S	1000 S	1000 S	1000	0.20 U	5.0 U	0.59	5.0 U	5.8 ^c	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenol	ug/L	4400	13000	450	NLV	NLV	29000000	82800000	1.0 U	5.0 U	1.0 U	5.0 U	1.8 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pyrene	ug/L	140 S	140 S	ID	140 S	140 S	140 S	135	0.20 U	5.0 U	0.59	5.0 U	6.3	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pyridine	ug/L	20 M	21	NA	5500	12000	94000	300000	1.0 U	--	1.0 U	--	1.8 U	--	--	--	--	--

TABLE 14
GROUNDWATER ANALYTICAL RESULTS
AOI 28 - LNAPL PLUME
PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criter																	
Sample Date:																		
Sample Type:																		
		Residential	NonResidential	Groundwater Surface	Groundwater Volatilization	Non-Residential	Groundwater	Water	MW64-08	MW64-08	MW68-08	MW68-08	MW74-08	MW74-08	MW84-12	MW84-12	MW85-12	MW87-12
		Drinking Water	Drinking Water	Water Interface	IndoorAir Inhalation	IndoorAir Inhalation	Contact	Solubility	04/07/2008	08/28/2012	04/07/2008	08/28/2012	04/07/2008	08/28/2012	08/30/2012	08/30/2012	08/29/2012	08/30/2012
																Duplicate		
Parameters	Units	a	b	c	d	e	f	g										
Metals																		
Aluminum	ug/L	50 V	50 V	NA	NLV	NLV	64000000	NA	157 ^{ab}	--	467 ^{ab}	--	459 ^{ab}	--	48	42	2300 ^{ab}	26
Antimony	ug/L	6 A	6 A	130 X	NLV	NLV	68000	NA	0.78 J	--	0.30 J	--	0.51 J	--	0.29 J	0.32 J	0.54 J	0.94 J
Arsenic	ug/L	10 A	10 A	10	NLV	NLV	4300	NA	5.0 U	--	5.0 U	--	5.0 U	--	0.96 J	1.5 J	2.7 J	1 J
Barium	ug/L	2000 A	2000 A	G	NLV	NLV	14000000	NA	46.7 J	--	23.4 J	--	90.8 J	--	46	51	23	92
Beryllium	ug/L	4 A	4 A	G	NLV	NLV	290000	NA	1.0 U	--	1.0 U	--	1.0 U	--	2 U	2 U	0.13 J	2 U
Cadmium	ug/L	5 A	5 A	G,X	NLV	NLV	190000	NA	1.0 U	--	1.0 U	--	1.0 U	--	0.079 J	0.11 J	0.49 J	0.15 J
Calcium	ug/L	NA	NA	NA	NA	NA	NA	NA	73200	--	73200	--	118000	--	--	--	--	--
Chromium	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	3.3 J	--	2.4 J	--	2.4 J	--	0.94 J	0.98 J	3.4 J	0.84 J
Chromium III (trivalent)	ug/L	100 A	100 A	G,X	NLV	NLV	290000000	NA	5 U	--	5 U	--	5 U	--	--	--	--	--
Chromium VI (hexavalent)	ug/L	100 A	100 A	11	NLV	NLV	460000	NA	10 U	--	10 U	--	10 U	--	--	--	--	--
Cobalt	ug/L	40	100	100	NLV	NLV	2400000	NA	7.0 U	--	7.0 U	--	13.3	--	0.95 J	1.1 J	1.3 J	1.3 J
Copper	ug/L	1000 E	1000 E	G	NLV	NLV	7400000	NA	2.3 U	--	2.0 U	--	4.1	--	4.3 J	3.1 J	9.1	4.9 J
Iron	ug/L	300 E	300 E	NA	NLV	NLV	58000000	NA	1080 ^{ab}	--	711 ^{ab}	--	1250 ^{ab}	--	130	96	2400 ^{ab}	38 J
Lead	ug/L	4 L	4 L	G,X	NLV	NLV	ID	NA	3.0 U	--	3.0 U	--	3.0 U	--	0.15 J	0.13 J	1.1 J	0.077 J
Magnesium	ug/L	400000	1100000	NA	NLV	NLV	1000000000 D	NA	24500	--	19200	--	29800	--	--	--	--	--
Manganese	ug/L	50 E	50 E	G,X	NLV	NLV	9100000	NA	91.7 ^{ab}	--	23.1	--	475 ^{ab}	--	68 ^{ab}	74 ^{ab}	23	46
Mercury	ug/L	2 A	2 A	0.0013	56 S	56 S	56 S	56	0.12 J ^c	--	0.20 U	--	0.20 U	--	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	ug/L	100 A	100 A	G	NLV	NLV	74000000	NA	20.0 U	--	20.0 U	--	8.6 J	--	8.2	9.1	6.2	10
Potassium	ug/L	NA	NA	NA	NA	NA	NA	NA	5320 J	--	2240 J	--	5990 J	--	--	--	--	--
Selenium	ug/L	50 A	50 A	5	NLV	NLV	970000	NA	5.4 ^c	--	4.5 J	--	5.0 U	--	5 J	2.6 J	3.8 J	1.9 J
Silver	ug/L	34	98	0.2 M	NLV	NLV	1500000	NA	0.20 U	--	0.20 U	--	0.20 U	--	5 U	5 U	5 U	5 U
Sodium	ug/L	120000	350000	NA	NLV	NLV	1000000000 D	NA	165000 ^a	--	124000 ^a	--	593000 ^{ab}	--	--	--	--	--
Thallium	ug/L	2 A	2 A	3.7 X	NLV	NLV	13000	NA	1.0 U	--	1.0 U	--	1.0 U	--	5 U	5 U	0.17 J	0.06 J
Vanadium	ug/L	4.5	62	27	NLV	NLV	970000	NA	2.1 J	--	1.0 J	--	4.0 U	--	5 U	5 U	4.4 J	5 U
Zinc	ug/L	2400	5000 E	G	NLV	NLV	110000000	NA	20.0 U	--	20.0 U	--	31.4	--	7.3 J	5.7 J	12	3 J
PCBs																		
All PCBs	ug/L	NA	NA	NA	NA	NA	NA	NA	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
General Chemistry																		
Cyanide (amenable)	ug/L	200 A	200 A	NA	NLV	NLV	57000	NA	5 U	--	5 U	--	14	--	--	--	--	--
Field Parameters																		
Conductivity, field	umhos/cm	NA	NA	NA	NA	NA	NA	NA	1.22	--	1.24	--	4.08	--	--	--	--	--
Dissolved oxygen (DO), field	ug/L	NA	NA	NA	NA	NA	NA	NA	9130	--	10750	--	12920	--	--	--	--	--
Oxidation reduction potential (ORP), field	millivolts	NA	NA	NA	NA	NA	NA	NA	163	--	53	--	-27	--	--	--	--	--
pH, field	s.u.	6.5 - 8.5 E	6.5 - 8.5 E	NA	NA	NA	NA	NA	5.93 ^{ab}	--	7.64	--	7.71	--	--	--	--	--
Temperature, ambient	Deg F	NA	NA	NA	NA	NA	NA	NA	50	--	50	--	50	--	--	--	--	--
Temperature, field	Deg C	NA	NA	NA	NA	NA	NA	NA	13.8	--	15.6	--	15.5	--	--	--	--	--
Turbidity, field	NTU	NA	NA	NA	NA	NA	NA	NA	39.5	--	20.9	--	40.9	--	--	--	--	--

Notes:
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.
J The associated value is qualified as an estimated quantity.
UJ The analyte was reported or qualified as not detected however, the sample report limit is qualified as an estimated value and may be inaccurate or imprecise.
(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
NA - Criteria not available or not applicable
NE - No exceedances above Part 201 Cleanup Criteria

	- Indicates concentration exceeded Part 201 Cleanup Criteria
	- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 15
SCENARIOS FOR POTENTIAL HUMAN EXPOSURE
PCC - VALIDATION
PONTIAC, MICHIGAN

On-Site					
Receptor Population	Exposure Medium	Exposure Route	Possible Currently?	Possible in Future?	Comments
Routine Workers	surface soil	ingestion and dermal contact	No	Yes	The facility is currently inactive, and former buildings have been removed to slabs. Potential exposures in the future may occur at unpaved areas, areas where slab or pavement is removed, and indoors if vapors from soil or LNAPL migrate through building foundations.
		inhalation of airborne particulates and vapors	No	Yes	
	subsurface soil	ingestion and dermal contact	No	Yes	
		inhalation of soil vapors	No	Yes	
		inhalation of vapors that migrate through building foundations	No	Yes	
	LNAPL	inhalation of LNAPL vapors	No	Yes	
	groundwater	ingestion and dermal contact	No	No	Exposure of workers via potable groundwater use is not expected because groundwater is not used as a drinking water supply at the Site or in the vicinity, and future potable groundwater use is not reasonably expected.
		inhalation of vapors that migrate through building foundations	No	Yes	
Construction Workers	surface and subsurface soil	ingestion and dermal contact, inhalation of airborne particulates and vapors	No	Yes	Current construction activities follow a Site-specific Heath and Safety Plan
	LNAPL	ingestion of smear zone soil, dermal contact with LNAPL, and inhalation of LNAPL vapors	No	Yes	Current construction activities follow a Site-specific Heath and Safety Plan. Potential exposures to LNAPL and groundwater in the future are possible in excavations that extend into LNAPL or groundwater.
	groundwater	ingestion, dermal contact, and inhalation of vapors	No	Yes	
Trespassers	surface soil	ingestion and dermal contact	Yes	Yes	Potential exposures may occur at unpaved areas and at areas where slab or pavement is removed.
		inhalation of airborne particulates and vapors	Yes	Yes	
	subsurface soil	ingestion and dermal contact	No	No	
		inhalation of soil vapors	Yes	Yes	
Off-Site					
Residents	surface soil	inhalation of airborne particulates and vapors	Yes	Yes	Potential airborne exposure to particulates and vapors from unpaved on-site areas is possible.
	groundwater	ingestion, dermal contact, and inhalation of vapors during household use	No	No	Exposure of workers via potable groundwater use is not expected because groundwater is not used as a drinking water supply at the Site or in the vicinity, and future potable groundwater use is not reasonably expected.
		ingestion, dermal contact, and inhalation of vapors during nonpotable use	Yes	Yes	
		inhalation of vapors that migrate through building foundations	Yes	Yes	Potential exposures may occur if vapors from shllow groundwater migrate through foundations.
		inhalation of vapors that migrate through basement sumps	No	Yes	Potential exposure may occur if shallow groundwater is encountered in basement sumps.
	homegrown produce	ingestion	Yes	Yes	Potential exposure is possible if homegrown produce is watered with groundwater
	Construction Workers	groundwater	ingestion, dermal contact, and inhalation of vapors	Yes	Yes

APPENDIX A

CA725 FORM

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action

Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: PCC-Validation
Facility Address: 200 South Boulevard West, Pontiac, Michigan
Facility EPA ID #: MID 980568836

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

 X If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	X			<i>See Tables 2 to 14 in the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013.</i>
Air (indoors) ²		X		
Surface Soil (e.g., <2 ft)		x		<i>See Tables 2 to 14 in the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013.</i>
Surface Water		X		
Sediment		X		
Subsurf. Soil (e.g., >2 ft)	X			
Air (outdoors)		X		

_____ If no (for all media) - skip to #6, and enter “YE,” status code after providing or citing appropriate “levels,” and referencing sufficient supporting documentation demonstrating that these “levels” are not exceeded

 X If yes (for any media) - continue after identifying key contaminants in each “contaminated” medium, citing appropriate “levels” (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter “IN” status code.

Footnotes:

¹ “Contamination” and “contaminated” describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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Rationale and Reference(s):

The screening criteria used to identify "contamination" and the results of the comparison of site characterization data with these criteria are discussed in Section 4.0 of the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013). The screening criteria used to identify "contamination" are the applicable Part 201 MDEQ criteria (MDEQ 2012). The applicable screening criteria are based on the intended land use (Nonresidential), future land use restrictions and Site specific characteristics as described in Section 4.1 the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013).

In AOI 1, AOI 12, and AOI 20 one or more constituents in soil have concentrations that are higher than the applicable Part 201 Criteria. In AOI 1, the constituent is benzene. Although benzene does not exceed applicable Part 201 criteria, the location was off-site and therefore subject to all MDEQ Part 201 criteria due to the lack of future off-site restrictions. In AOI 12, these constituents are Anthracene, Benzo(a) anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Dibenz(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene and Pyrene, and in AOI 20, these constituents are PCBs.

In AOI 1, AOI 2, AOI 5, and AOI 28 one or more constituents have concentrations in groundwater that are higher than the applicable Part 201 Criteria. In AOI 1, the constituents are TCE, aluminum, iron, manganese, selenium and silver. Although the constituents do not exceed applicable Part 201 criteria, the location was off-site and therefore compared to all MDEQ Part 201 criteria due to the lack of future off-site restrictions. In AOI 2 and AOI 28, these constituents are Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, Chrysene and Indeno(1,2,3-cd)pyrene. These constituents were detected at MW74-08 which is also used to monitor AOI 2 and AOI 28, so the constituents are also part of both AOIs but located in one area. In AOI 5, these constituents are Benzo(g,h,i)perylene, and Indeno(1,2,3-cd)pyrene, in MW37-07. The SVOC exceedances at monitoring wells MW74-08 and MW37-07 reflect data collected in 2008. During the Phase III ESA, both monitoring wells were re-sampled and the analytical results indicated SVOCs were below applicable Part 201 criteria.

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3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

“Contaminated” Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food ³
Groundwater	<u>Yes</u>	<u>No</u>	<u>No</u>	<u>Yes</u>			<u>No</u>
Air (indoors)	<u>--</u>	<u>--</u>	<u>--</u>				
Soil (surface, e.g., <2 ft)	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
Surface Water	<u>No</u>	<u>No</u>			<u>No</u>	<u>No</u>	<u>No</u>
Sediment	<u>--</u>	<u>--</u>			<u>--</u>	<u>--</u>	<u>--</u>
Soil (subsurface e.g., >2 ft)	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>	<u>No</u>
Air (outdoors)	<u>--</u>	<u>--</u>			<u>--</u>	<u>--</u>	<u>--</u>

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.
2. enter “yes” or “no” for potential “completeness” under each “Contaminated” Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential “Contaminated” Media - Human Receptor combinations (Pathways) do not have check spaces (“___”). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter “YE” status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

 X If yes (pathways are complete for any “Contaminated” Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any “Contaminated” Media - Human Receptor combination) - skip to #6 and enter “IN” status code..

Rationale and Reference(s):

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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The existence of exposure pathways to soil and groundwater under current conditions is discussed in Section 5.3 of the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013).

Currently, no operations are conducted at the site, and the former manufacturing buildings have been demolished so that only foundation slabs remain. Current workers at the Site are limited to those supporting environmental investigations. Current and future workers need to follow a Site-specific health and safety plan to avoid the potential for significant exposures during all activities on-Site, including subsurface activities. Therefore, the only potential for current on-Site exposure to contaminated soil is exposure of trespassers to surface soil in unpaved areas, although the Site is fenced to control. AOI 12 is unpaved with soil exceedances of direct contact collected from test pit TP-1 at a depth of 10 feet bgs. During the Phase III ESA and Supplemental Phase III ESA, soil samples were collected from the surface soil to the north, south, east and west with results all below applicable Part 201 Criteria. Therefore there is no potential for direct contact with contaminated soils on-Site.

Potential exposure of workers during off-Site construction activities along the ROW or adjacent ROW north of the site are a potential exposure pathway. The impacts are limited to a Benzene exceedance of DWC. Since it did not exceed DCC, there is no potential for direct contact with contaminated soils off-Site.

Based on the results of ENVIRON Quantitative Risk Assessment results summarized in Table 3b, Table 4, and Table 5 of Appendix F of the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013) the constituent concentrations above do not indicate a potential for significant worker exposures at the Site

The Site and the surrounding area obtain potable water from the municipal drinking water system and do not use local groundwater as drinking water or industrial water supply. Therefore, current exposure to potable groundwater use is not a complete pathway. Potential exposure via non-potable groundwater use at off-site areas down-gradient of the Site is a potential pathway. Potential exposure of workers during off-Site construction activities that extend into the water table at areas with contaminated groundwater is also possible.

There is no other complete exposure pathway between contaminated soil and groundwater and human receptors that can be reasonably expected under current conditions

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4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**⁴ (i.e., potentially “unacceptable” because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable “levels” (used to identify the “contamination”); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable “levels”) could result in greater than acceptable risks)?

 X If no (exposures can not be reasonably expected to be significant (i.e., potentially “unacceptable”) for any complete exposure pathway) - skip to #6 and enter “YE” status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If yes (exposures could be reasonably expected to be “significant” (i.e., potentially “unacceptable”) for any complete exposure pathway) - continue after providing a description (of each potentially “unacceptable” exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to “contamination” (identified in #3) are not expected to be “significant.”

 If unknown (for any complete pathway) - skip to #6 and enter “IN” status code

Rationale and Reference(s):

The significance of potential exposure to soil at AOI 1, AOI 2, AOI 5, and AOI 28 and to groundwater at onsite and off-site areas of contamination is discussed in the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013) in Section 5.4.1 and 5.4.2, respectively. As discussed in Section 5.4.1, based on the Phase III and Supplemental Phase III ESA no significant exposures in soil exist on-Site. The soil impacts at AOI 12 were delineated by samples collected at BH98-12 to the north, BH99-12 to the east, BH100-12 to the south and BH115-12 to the west. The soil impacts at AOI 20 were delineated to the north (BH102-12), east (BH103-12), south (BH104-12) and west (BH105-12). Based on the delineation of impacts, it is unlikely soil located on-Site pose a potential for significant exposure. In addition, ENVIRON Quantitative Risk Assessment results summarized in Appendix F of the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA 2013), indicate the concentrations of impacts at AOI 12 and AOI 20 (from the Phase II ESA Results) do not indicate a potential for significant worker exposure.

AOI 1 had impacts in soil along the ROW to the north of the site. The impacted soil was detected below the applicable Part 201 criteria, however the area is not subject to future land use restrictions so the soil was compared to all MDEQ criteria. Impacts were detected above MDEQ Part 201 Drinking Water Protection Criteria; however, a corresponding groundwater sample from the same location did not exceed DW-C. Since the site and the surrounding area obtain potable water from the municipal drinking water system and do not use local groundwater as drinking water or industrial water supply it is unlikely to pose a potential for significant exposure.

As discussed in Section 2.4.2, potential exposure to contaminated groundwater under current conditions is limited to the off-site area down-gradient of AOI 1. Potential exposure of residents to site-related constituent to groundwater is limited to outdoor recreation since groundwater is not currently or reasonable expected for future potable water supply. Therefore, since the impacted groundwater only exceeded MDEQ Part 201 Drinking Water Criteria (DWC) and Groundwater to Surface Water Interface (GSI) Criteria, the site generated groundwater migrating off-site does not pose significant direct contact exposure to residents. Potential exposure to construction workers via groundwater contact in off-site areas downgradient of AOI 1, if to occur, would be limited to the impacted groundwater that exceeds only DWC and GSI. Therefore, concentrations of constituents in off-site groundwater do not present a significant exposure.

⁴ If there is any question on whether the identified exposures are “significant” (i.e., potentially “unacceptable”) consult a human health Risk Assessment specialist with appropriate education, training and experience.

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

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5. Can the “significant” **exposures** (identified in #4) be shown to be within **acceptable** limits?

 x If yes (all “significant” exposures have been shown to be within acceptable limits) - continue and enter “YE” after summarizing and referencing documentation justifying why all “significant” exposures to “contamination” are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

 If no (there are current exposures that can be reasonably expected to be “unacceptable”)- continue and enter “NO” status code after providing a description of each potentially “unacceptable” exposure.

 If unknown (for any potentially “unacceptable” exposure) - continue and enter “IN” status code

Rationale and Reference(s):

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)
Page 8

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

 YE YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the PCC-Validation facility, EPA ID # MID 980568836, located at 200 South Boulevard West, Pontiac, Michigan under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

 NO - "Current Human Exposures" are NOT "Under Control."

 IN - More information is needed to make a determination.

Completed by (signature) _____ Date _____
 (print) _____
 (title) _____

Supervisor (signature) _____ Date _____
 (print) _____
 (title) _____
 (EPA Region or State) _____

Locations where References may be found:

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)

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- CRA, Phase I Environmental Site Assessment (North Parcel), General Motors Pontiac Centerpoint Campus – Validation Center, Pontiac, Michigan, 2009a
- CRA, Phase II Environmental Site Assessment (North Parcel), General Motors Pontiac Centerpoint Campus – Validation Center, Pontiac, Michigan, 2009b
- CRA, Phase II Environmental Site Assessment (South Parcel), General Motors Pontiac Centerpoint Campus – Validation Center, Pontiac, Michigan, 2009c
- CRA, Phase I Environmental Site Assessment (Vacant Parcel), General Motors Pontiac Centerpoint Campus – Validation Center, Pontiac, Michigan, 2009d
- CRA, Draft Current Conditions Report, PCC-Validation, Pontiac, Michigan, 2011
- CRA, Supplemental Current Conditions Report, PCC-Validation, Pontiac, Michigan, 2012a
- CRA, Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan, PCC-Validation, Pontiac, Michigan, 2012b
- CRA, RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013
- Section 5. of the RCRA EI CA725 Report, PCC-Validation, Pontiac Michigan, 2013 (CRA, 2013) provides the full citation for relevant documents including: ENVIRON, Memorandum – Quantitative Risk Assessment Results, GM Pontiac Validation Center, Pontiac, Michigan 2008

Contact telephone and e-mail numbers

(name) _____
(phone #) _____
(e-mail) _____

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.

APPENDIX B

SOIL BORING LOGS AND MONITORING WELL CONSTRUCTION LOGS



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW89-12
DATE COMPLETED: December 3, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	ASPHALT	0.25	CONCRETE				
	SW/GW-SAND AND GRAVEL (FILL), trace silt, compact, fine to medium grained sand, fine grained angular gravel, well graded, dark brown, moist	1.00	BENTONITE CHIPS				
2	CL-SILTY CLAY (FILL), trace sand, trace gravel, stiff, low plasticity, brown and gray, moist	1.60	2" PVC WELL CASING	1DP		80	
4	CL-SILTY CLAY (natural), trace sand, trace fine grained gravel (pebbles), hard, low plasticity, brown, moist, vertical gray, weathered		8-1/4" BOREHOLE				
6							
	SP-SAND, trace silt, compact, fine grained, poorly graded, light brown, moist to very moist - 1/4" silty clay at 6.6ft BGS	6.40 6.70 7.20	2" PVC WELL CASING	2DP		90	
8	CL-SILTY CLAY, with wet silt and wet sand laminations, firm, low plasticity, light brown, very moist	8.50					
10	SP-SAND, trace silt, compact, fine grained, poorly graded, gray, wet		SAND PACK				
	SM-SILTY SAND, compact, fine grained, poorly graded, grayish brown, wet	10.20 10.70					
12	CL-SILTY CLAY, stiff, low plasticity, light brown, wet	11.30					
	ML-SANDY SILT, compact, no plasticity, very fine grained sand, light brown, wet	12.40		3DP		90	
14	CL-SILTY CLAY, firm, low plasticity, light brown, wet - gray at 12.0ft BGS	12.90					
	SP-SAND, with silt, compact, very fine grained, poorly graded, gray, wet						
16	CI-SILTY CLAY, firm, medium plasticity, gray, wet - sand lamination at 13.9ft BGS - sand lamination at 14.4ft BGS	15.00					
18	END OF BOREHOLE @ 15.0ft BGS						
20							
22							
24							

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/8/13

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW90-12
DATE COMPLETED: December 3, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	ML-SANDY CLAYEY SILT (FILL), trace fine gravel, firm, slight plasticity, brown and gray, moist		CONCRETE					0.0
2	SM-SILTY SAND (FILL), trace wood and rootlets, loose, fine grained, poorly graded, dark brown, damp	1.60 2.00 2.20	BENTONITE CHIPS	10P		70		
	GP-GRAVEL (FILL), coarse grained, compact, poorly graded, gray, damp		2" PVC WELL CASING					0.0
4	SP-SAND (FILL), trace silt, compact, fine grained, poorly graded, light brown, damp		8-1/4" BOREHOLE					
	CL-SILTY CLAY (FILL), trace fine grained gravel (pebbles), firm, low plasticity, brown, moist	5.40 6.50		20P		90		0.0
6	CL-SILTY CLAY (natural), firm, low plasticity, brown, moist							
8	- 1" wet silty sand at 7.4ft BGS - 1/2" wet silty sand at 7.7ft BGS - 1/2" wet sandy clay at 8.1ft BGS - 1-1/2" clayey sand, trace gravel at 8.9ft BGS							0.0
10	- 1" very moist silty sand at 10.9ft BGS							
	ML-SANDY SILT, with sand laminations and silt laminations, compact, slight plasticity, light brown, very moist	11.20 11.60 12.00 12.30	2" PVC WELL CASING	30P		90		0.0
12	SW-SAND, trace fine grained gravel, trace silt, compact, fine to medium grained, well graded, brown, very moist	12.80						
14	CL-SILTY CLAY, firm, low plasticity, brown, moist to very moist	13.50 14.20 14.80 15.00	SAND PACK					0.0
	ML-SANDY SILT, few clay, several sand laminations, firm, slight plasticity, brown, wet							
16	SW/GW-SAND AND GRAVEL, trace silt, compact, fine to coarse grained sand, fine grained subrounded gravel, well graded, brown, wet							
18	CL-SILTY CLAY, firm, low plasticity, light brown, very moist, several silt laminations							
	SP-SAND, trace fine grained gravel, trace silt, compact, fine grained, poorly graded, brown, wet							
20	- gravelly sand, increase in sand grain size and gravel grain size at 14.5ft BGS							
	CL-SILTY CLAY, trace sand, stiff, low plasticity, light brown, moist							
22	END OF BOREHOLE @ 15.0ft BGS							
24								

WELL DETAILS

Screened interval:
10.00 to 15.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 0.010
Material: PVC
Seal:
1.00 to 8.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
8.00 to 15.50ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/8/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW91-12
DATE COMPLETED: December 3, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE		CONCRETE					
2	SP-SAND (FILL), trace silt, compact, fine grained, poorly graded, light brown, moist	0.85	BENTONITE CHIPS	1DP		70		0.0
4			2" PVC WELL CASING					0.0
6	SW/GW-SAND AND GRAVEL (FILL), trace silt, compact, fine to medium grained sand, fine to medium grained subangular gravel, well graded, brown, moist	5.80	8-1/2" BOREHOLE					0.0
8	- 1" dark gray at 6.1ft BGS	6.70		2DP		90		0.0
	CL-SILTY CLAY (FILL), trace fine grained gravel, firm, low plasticity, gray, moist	7.20						0.0
	- 1/2" highly oxidized at 7.1ft BGS							0.0
10	CL-SILTY CLAY, trace sand, trace fine grained subrounded gravel (pebble size to 1/2"), stiff, low plasticity, brown, moist							0.0
	- trace gravel up to 3/4" at 9.3ft BGS							0.0
12				3DP		100		0.0
	- occasional sand laminations at 12.9ft BGS							0.0
14	- 1-1/2" sand, with silt at 13.8ft BGS							0.0
	- 2" sand, with silt at 14.1ft BGS							0.0
	- 1" sandy silt, very moist at 14.5ft BGS							0.0
16	SM-SAND, with silt, trace fine grained subrounded gravel, compact, fine grained, poorly graded, brown, moist to very moist	16.00						0.0
		16.50						0.0
		16.80						0.0
18	CL-SILTY CLAY, stiff, low plasticity, brown, moist to very moist	17.50		4DP		90		0.0
		18.00						0.0
	SP-SAND, trace silt, compact, fine grained, poorly graded, brown, very moist	18.60	2" PVC WELL CASING					0.0
	- wet at 17.2ft BGS	18.90						0.0
20	ML-SANDY SILT, few clay, firm, slight plasticity, fast to moderate dilatancy, light brown, wet, several sand laminations	19.30						0.0
			SAND PACK					0.0
22	SP-SAND, few silt, trace fine grained gravel (pebbles), compact, fine grained, poorly graded, brown, wet	22.00						0.0
								0.0
	ML-SANDY SILT, few clay, firm, slight plasticity, brown, wet, rapid dilatancy, laminated	23.00		5DP		90		0.0
		23.30						0.0
24	SP-SAND, with gravel, compact, fine grained sand, fine grained gravel, poorly graded,	23.80						0.0
								0.0
WELL DETAILS Screened interval: 16.50 to 21.50ft BGS Length: 5ft Diameter: 2in Slot Size: 0.010 Material: PVC Seal:								
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE								

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/8/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW91-12
DATE COMPLETED: December 3, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
26	brown, wet ML-SILT, trace clay, trace fine grained sand, firm, slight plasticity, brown, very moist to wet - 3" fine grained sand at 21.3ft BGS - 1-1/2" fine grained sand at 21.8ft BGS	25.00	0.50 to 14.00ft BGS Material: BENTONITE CHIPS Sand Pack: 14.00 to 21.50ft BGS Material: SAND					
28	ML-SILT, with clay, trace sand, firm, low plasticity, brown, very moist, moderate dilatancy, laminated							
30	SM/ML-SANDY SILT/SILTY SAND, compact, fine grained, highly oxidized, very moist							
32	SP-SAND, trace silt, compact, fine grained, poorly graded, brown, wet - 1/2" silty clay at 23.6ft BGS ML-CLAYEY SILT, firm, low plasticity, brown, moist END OF BOREHOLE @ 25.0ft BGS							
34								
36								
38								
40								
42								
44								
46								
48								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/8/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH110-12

PROJECT NUMBER: 17322

DATE COMPLETED: December 5, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	ML-SANDY SILT (FILL), trace clay, trace gravel, trace asphalt, trace concrete, compact, no plasticity, brown and gray, moist	2.10	 BACKFILLED WITH BENTONITE CHIPS	0-2'-010	90			0.0
4	CL/ML-CLAY AND SILT (FILL), trace sand, trace gravel, firm, slight plasticity, brown, moist - 2" wood debris at 3.8ft BGS	5.00		1DP				0.0
	END OF BOREHOLE @ 5.0ft BGS			3-4'-011				
6								
8								
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH111-12
DATE COMPLETED: December 5, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	ML-SANDY CLAYEY SILT (FILL), trace gravel, trace bricks, concrete, asphalt, compact, no plasticity, brown, moist - dark gray at 0.5ft BGS - brown at 1.0ft BGS	1.60	← BACKFILLED WITH BENTONITE CHIPS	0-2' -013/ 014	100			0.0
4	CL-SILTY CLAY (FILL), trace sand, trace gravel, trace concrete, firm, low plasticity, brown, moist	4.60		1DP				0.0
6	CONCRETE	5.00		3-4' -015				
6	END OF BOREHOLE @ 5.0ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH112-12

DATE COMPLETED: December 5, 2012

DRILLING METHOD: DIRECT PUSH

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	ML-CLAYEY SILT (FILL), trace sand, trace gravel, trace concrete, firm, no plasticity, gray, moist							0.0
4								0.4
5.20		5.20						
5.50	SP-SAND (FILL), trace silt, compact, fine grained, poorly graded, brown, very moist, faint odor	5.50		5.5' -005				0.7
6								
8	CL-SILTY CLAY, trace gravel, firm, low plasticity, gray, moist, several silt laminations			2DP		100		0.2
10								0.1
12	- faint odor at 10.5ft BGS							0.7
14								
16	- faint odor at 15.5ft BGS							0.7
18	- 1/2" sand, wet at 16.0ft BGS							
16.80		16.80						
17.50	ML-SANDY SILT, compact, very fine grained sand, no plasticity, gray, wet	17.50		4DP		100		0.1
18.70		18.70						
19.20	CL-SILTY CLAY, firm, low plasticity, gray, wet, sand laminations throughout	19.20						0.1
20	- 1-1/2" sand at 18.0ft BGS							
22	SP-SAND, trace silt, compact, fine grained, poorly graded, gray, wet							
24	CL-SILTY CLAY, firm, low plasticity, gray, moist to very moist			5DP		100		0.1
25.00	END OF BOREHOLE @ 25.0ft BGS	25.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH113-12

PROJECT NUMBER: 17322

DATE COMPLETED: December 5, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
2	SP-SAND (FILL), trace fine grained gravel, trace silt, compact, fine grained, poorly graded, light brown, damp	0.80	← BACKFILLED WITH BENTONITE CHIPS	1DP	80			0.0
4	- no gravel, dark brown at 4.0ft BGS							0.0
6	CL-SILTY CLAY (FILL), firm, low plasticity, brown, moist, faint odor	5.50		2DP	100			0.0
8	- trace fine grained gravel, gray at 7.8ft BGS							NA
10								NA
12	CL-SILTY CLAY (natural), trace fine grained gravel, stiff, low plasticity, brown, with gray mottling, moist	12.30		3DP	100			NA
14	- gray at 14.5ft BGS							NA
16								NA
18	- 1" lens wet sand, olive gray and dark gray laminations at 17.0ft BGS			17'-007 4DP	90			NA
20	- 2" lens wet sand at 17.8ft BGS							NA
20	- 2" lens wet sand at 19.2ft BGS							NA
20	END OF BOREHOLE @ 20.0ft BGS	20.00						
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH114-12
DATE COMPLETED: December 5, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SM-SILTY SAND (FILL), trace fine grained gravel, compact, fine grained, poorly graded, brown, moist	1.00	← BACKFILLED WITH BENTONITE CHIPS	0-2' -015	1DP	90		0.0
4	CL/ML-CLAY AND SILT (FILL), trace sand, trace gravel, trace concrete, wood, metal debris, soft to firm, slight plasticity, brown, moist - dark brown at 2.5ft BGS - light brown at 4.5ft BGS	5.00		3-4' -016				0.0
6	END OF BOREHOLE @ 5.0ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH115-12

PROJECT NUMBER: 17322

DATE COMPLETED: December 5, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	ML-SILT (FILL), with clay, soft, low plasticity, brown and gray, moist, trace vegetation	0.50		0-2'-017				0.0
2	CL-SILTY CLAY (FILL), trace sand, trace gravel, trace concrete, soft, low plasticity, brown, moist - 2" trace asphalt, gray sand at 0.9ft BGS	1.80 2.30	← BACKFILLED WITH BENTONITE CHIPS	10P		90		
4	ML-SANDY SILT (FILL), very loose, no plasticity, light brown, dry	3.10		3-4'-018				0.0
	ASPHALT	3.60						
	CONCRETE	3.80						
6	CL-SILTY CLAY (FILL), firm, low plasticity, brown, moist	5.00						
8	ML-SANDY SILT (FILL), with asphalt, loose, no plasticity, gray, moist END OF BOREHOLE @ 5.0ft BGS							
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS





STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH116-12
DATE COMPLETED: December 5, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	ML-SILT (FILL), with clay, trace sand, trace gravel, trace concrete, loose, no plasticity, brown, moist	1.00	← BACKFILLED WITH BENTONITE CHIPS	0-2' -019	1DP	90		0.0
4	SM-SILTY SAND (FILL), trace gravel, trace concrete and wood debris, loose, fine grained, poorly graded, gray, damp	3.70		3-4' -020				0.0
6	CL-SILTY CLAY (FILL), trace sand, trace gravel, trace concrete, slag, asphalt, soft, low plasticity, several sand lenses and silt lenses up to 1" thick, brown and gray lenses, moist	5.00						
	END OF BOREHOLE @ 5.0ft BGS							
8								
10								
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13

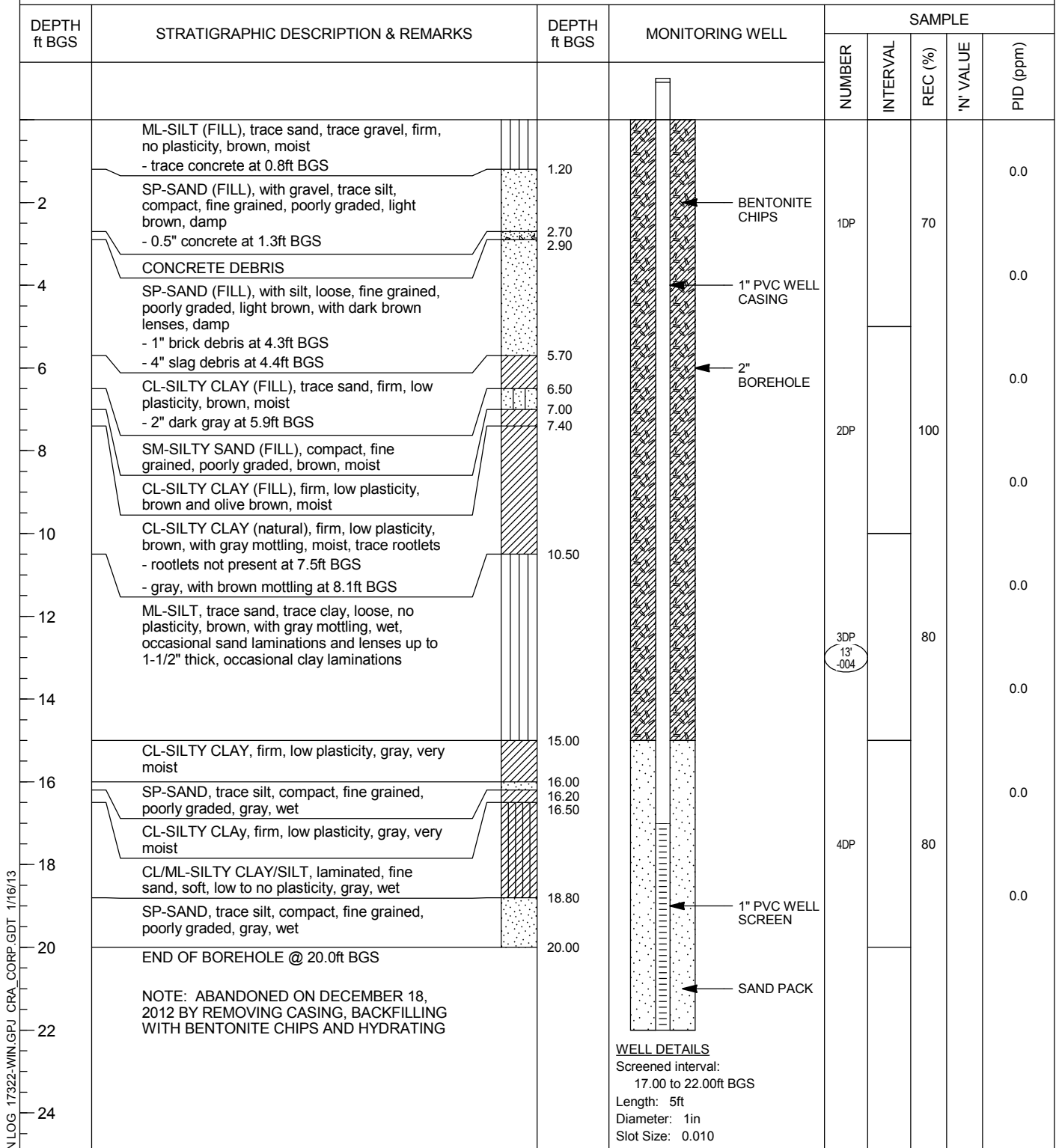


STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW11-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER



NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW11-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
26			Material: PVC Seal: 0.00 to 15.00ft BGS Material: BENTONITE CHIPS Sand Pack: 15.00 to 22.00ft BGS Material: SAND					
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

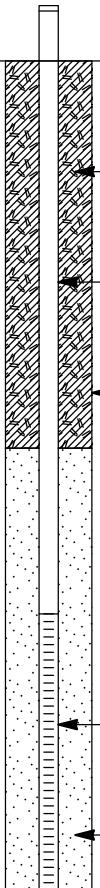
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW1S-12

DATE COMPLETED: December 4, 2012

DRILLING METHOD: DIRECT PUSH

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
2	ML-SILT (FILL), trace sand, trace gravel, firm, no plasticity, brown, moist - trace concrete at 0.8ft BGS	1.20	 BENTONITE CHIPS 1" PVC WELL CASING 2" BOREHOLE 1" PVC WELL SCREEN SAND PACK				
	SP-SAND (FILL), with gravel, trace silt, compact, fine grained, poorly graded, light brown, damp - 0.5" concrete at 1.3ft BGS	2.70 2.90					
4	CONCRETE DEBRIS						
	SP-SAND (FILL), with silt, loose, fine grained, poorly graded, light brown, with dark brown lenses, damp - 1" brick debris at 4.3ft BGS - 4" slag debris at 4.4ft BGS	5.70					
6	CL-SILTY CLAY (FILL), trace sand, firm, low plasticity, brown, moist - 2" dark gray at 5.9ft BGS	6.50 7.00 7.40					
8	SM-SILTY SAND (FILL), compact, fine grained, poorly graded, brown, moist						
	CL-SILTY CLAY (FILL), firm, low plasticity, brown and olive brown, moist						
10	CL-SILTY CLAY (natural), firm, low plasticity, brown, with gray mottling, moist, trace rootlets - rootlets not present at 7.5ft BGS - gray, with brown mottling at 8.1ft BGS	10.50					
12	ML-SILT, trace sand, trace clay, loose, no plasticity, brown, with gray mottling, wet, occasional sand laminations and lenses up to 1-1/2" thick, occasional clay laminations						
14							
	END OF BOREHOLE @ 15.0ft BGS	15.00					
16	NOTE: ABANDONED ON DECEMBER 5, 2012 BY REMOVING CASING, BACKFILLING WITH BENTONITE CHIPS AND HYDRATING		<u>WELL DETAILS</u> Screened interval: 10.00 to 15.00ft BGS Length: 5ft Diameter: 1in Slot Size: 0.010 Material: PVC Seal: 0.00 to 7.00ft BGS Material: BENTONITE CHIPS Sand Pack: 7.00 to 15.00ft BGS Material: SAND				
18							
20							
22							
24							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW2I-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	ML-SILT (FILL), trace sand, trace gravel, some vegetation, loose, no plasticity, brown, moist							0.0
2	SM/ML-SILTY SAND/SANDY SILT (FILL), trace fine grained gravel, compact, no plasticity, brown, moist - 1-1/2" concrete at 2.2ft BGS	1.90	BENTONITE CHIPS	1DP		80		
4	- trace coarse grained gravel at 2.8ft BGS	3.60	1" PVC WELL CASING					0.0
	SM-SAND (FILL), with silt, trace fine grained gravel, compact, fine grained, poorly graded, brown, moist - wet at 4.5ft BGS	4.80						
6	GM-SILTY GRAVEL (FILL), trace sand, compact, fine to coarse grained angular gravel, poorly graded, brown, wet	5.40	2" BOREHOLE					0.0
8	CL-SILTY CLAY (FILL), firm, low plasticity, dark gray, moist - with olive gray lenses at 5.9ft BGS	6.20		2DP		100		
	CL-SILTY CLAY (natural), stiff, low plasticity, brown, with gray and white mottling, moist - occasional silt laminations and oxidized laminations at 7.0ft BGS	10.50						0.0
12	ML-SILT, with very fine grained sand, compact, no plasticity, rapid dilatancy, oxidized brown, very moist to wet	11.50						0.0
	CL-SILTY CLAY, firm, low plasticity, gray, wet	12.50		3DP		100		
14	SM-SILTY SAND, compact, very fine grained, poorly graded, gray, wet - 1" laminated sand/silt/clay at 12.8ft BGS - 1-1/2" laminated sand/silt/clay at 13.2ft BGS	13.40	1" PVC WELL SCREEN					0.0
16	CL-SILTY CLAY, with silt laminations and wet sand laminations, firm, low plasticity, light and dark gray, wet	14.60	SAND PACK					0.0
18	SP-SAND, trace silt, compact, fine grained, poorly graded, gray, wet - medium grained at 16.0ft BGS - medium to coarse grained at 16.7ft BGS - 1/2" silty clay at 16.9ft BGS - fine grained at 17.0ft BGS	17.20	NATURAL COLLAPSE	4DP		100		
20	CL-SILTY CLAY, firm, low plasticity, gray, wet, several silt laminations and wet sand laminations throughout - 3/4" fine grained sand, wet at 18.3ft BGS - 1/2" fine grained sand, wet at 18.6ft BGS - 3/4" medium grained sand at 18.9ft BGS - 1/2" sand, wet at 19.4ft BGS	20.00						0.0
22	END OF BOREHOLE @ 20.0ft BGS							
24	NOTE: ABANDONED ON DECEMBER 7, 2012 BY REMOVING CASING, BACKFILLING WITH BENTONITE CHIPS AND HYDRATING							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW2I-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
26			9.00 to 17.00ft BGS Material: SAND					
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

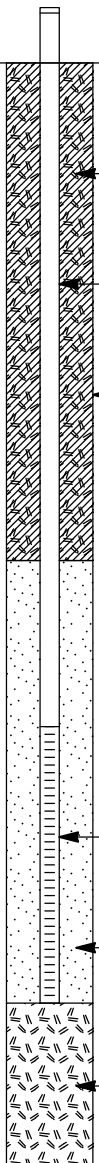
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW3I-12

DATE COMPLETED: December 4, 2012

DRILLING METHOD: DIRECT PUSH

FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE					
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)	
2	ML-SILT (FILL), with sand and vegetation (rootlets), loose, light brown, moist SM-SILTY SAND (FILL), with gravel, compact, fine grained, poorly graded, brown, moist	0.50	 BENTONITE CHIPS 1" PVC WELL CASING 2" BOREHOLE 1" PVC WELL SCREEN SAND PACK NATURAL COLLAPSE	1DP	90	90		0.0	
4	CONCRETE BRICK DEBRIS (FILL)	3.80						0.0	
	SP-SAND (FILL), trace silt, compact, fine grained, poorly graded, light brown, moist	4.30						0.0	
6									
	SM-SILTY SAND (FILL), trace clay, compact, fine grained, poorly graded	6.30						0.0	
8	CL-SILTY CLAY (FILL), firm, low plasticity, olive gray, moist - gray and dark gray at 7.4ft BGS - olive gray at 7.7ft BGS	7.00						0.0	
	CL-SILTY CLAY (natural), firm, low plasticity, gray, with brown mottling, moist - several wet sand laminations at 9.5ft BGS	8.70						0.0	
10		10.20							
12	ML-SILT, with sand, very loose, no plasticity, brown, wet - loose at 10.5ft BGS	11.00						0.0	
	CL-SILTY CLAY, firm, low plasticity, gray, very moist - wet sand laminations and wet silt laminations throughout (several) at 11.5ft BGS								
14		15.00							
16	SM-SILTY SAND, compact, fine to medium grained sand, poorly graded, gray, wet								
18	CL-SILTY CLAY, firm, low plasticity, gray, very moist, wet sand and wet silt laminations throughout - 1" coarse grained gravel at 18.8ft BGS	17.00							
20	END OF BOREHOLE @ 20.0ft BGS	20.00							
22	NOTE: ABANDONED ON DECEMBER 7, 2012 BY REMOVING CASING, BACKFILLING WITH BENTONITE CHIPS AND HYDRATING		<u>WELL DETAILS</u> Screened interval: 12.00 to 17.00ft BGS Length: 5ft Diameter: 1in Slot Size: 0.010 Material: PVC Seal: 0.00 to 9.00ft BGS Material: BENTONITE CHIPS Sand Pack:						
24									

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW3I-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
26			9.00 to 17.00ft BGS Material: SAND					
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW4I-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	ML-SILT (FILL), with sand and vegetation, loose, no plasticity, light brown, moist	0.50						
	SW-SAND (FILL), with gravel, trace concrete debris, compact, fine to medium grained sand, fine grained angular gravel, well graded, light brown, damp	1.20						0.0
2		1.70						
	SM-SILTY SAND (FILL), loose, fine grained, poorly graded, light brown, damp							
4								0.0
	CL-SILTY CLAY (FILL), trace gravel, firm, low plasticity, light brown, moist	4.30						
	SP-SAND (FILL), trace silt, loose, fine grained, poorly graded, light brown, damp							
6	- 1" highly oxidized at 4.5ft BGS							0.0
	- dark brown at 4.6ft BGS							
	- dark brown, with light brown lenses up to 1" thick at 6.5ft BGS							
8		7.60						
	ML-SANDY SILT (FILL), firm, no plasticity, dark gray, moist	8.30						0.0
	CL-SILTY CLAY (FILL), trace fine grained sand, trace fine grained gravel, soft, low plasticity							
10								
	CL-SILTY CLAY (natural), soft, low plasticity, gray, with brown mottling, moist to very moist, several sand laminations and silt laminations	10.50						0.0
12	- wet at 12.0ft BGS							
		13.00						
14								0.0
	ML-SANDY SILT, loose, no plasticity, gray, wet, sand laminations and lenses up to 1/2" thick throughout							
16								0.0
	- 2-1/2" silty clay at 15.0ft BGS							
18		17.50						
	CL-SILTY CLAY, trace fine grained sand, trace fine grained gravel, firm, low plasticity, gray, very moist to wet							
	- 1/2" fine grained sand at 17.7ft BGS							
	- 0.7" pinkish gray lens at 19.0ft BGS							0.0
20		20.00						
	END OF BOREHOLE @ 20.0ft BGS							
22								
	NOTE: ABANDONED ON DECEMBER 7, 2012 BY REMOVING CASING, BACKFILLING WITH BENTONITE CHIPS AND HYDRATING							
24								

WELL DETAILS
Screened interval:
13.00 to 18.00ft BGS
Length: 5ft
Diameter: 1in
Slot Size: 0.010
Material: PVC
Seal:
0.00 to 10.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: TMW4I-12
DATE COMPLETED: December 4, 2012
DRILLING METHOD: DIRECT PUSH
FIELD PERSONNEL: D. DEITNER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
26			10.00 to 18.00ft BGS Material: SAND					
28								
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 1/16/13



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH100-12

DATE COMPLETED: August 21, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace silt and fine gravel, compact, fine to coarse grained, poorly graded, brown, moist			0-2' -027				2.0
4	CL-SANDY CLAY, trace fine gravel, firm, fine to coarse sand, low plasticity, brown and rust brown, moist	4.00		1DP		50		2.4
6	- 0.3' concrete debris at 5.5ft BGS							1.6
8	SP-SAND, compact, fine grained, poorly graded, light brown, moist	8.00		2DP				1.7
10	ML-SANDY SILT, compact, fine sand, non plastic, brown and orange brown, moist	9.50 10.00		9-11' -028				1.8
12	SP-SAND, compact, fine grained, poorly graded, light brown, moist	11.80		3DP				2.1
14	ML-SANDY SILT, compact, fine sand, non plastic, brown and orange brown, moist							
14	- 0.2' fine sand seam at 12.5ft BGS							
14	- 0.1' fine sand seam at 14.0ft BGS							
16	SP-SAND, compact, fine grained, poorly graded, light brown, moist	14.50 15.00		13-15' -029/ 030				
16	END OF BOREHOLE @ 15.0ft BGS							
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH101-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 21, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace silt and fine gravel, compact, fine to coarse grained, poorly graded, brown, moist			0-2' -018				2.2
4	CL-SANDY CLAY, trace fine gravel, firm, fine to coarse sand, low plasticity, brown and rust brown, moist	3.00		1DP		66		2.0
6								
8	SP-SAND, trace fine gravel, compact, fine to coarse grained, poorly graded, dark brown, moist	6.50						1.2
		7.50						
10	CL-SILTY CLAY (FILL), trace fine sand to fine gravel, stiff, low plasticity, brown and gray, moist	8.50						1.6
		9.60		9-11' -019				
12	ML-SANDY SILT, compact, fine sand, non plastic, brown and orange brown, moist	12.00						1.9
		12.80						
14	ML-SANDY SILT, compact, fine sand, non plastic, brown and orange brown, moist	13.50						
		14.50		13-15' -020				1.9
16	SP-SAND, compact, fine grained, poorly graded, light brown, moist	15.00		3DP		80		
18	ML-SANDY SILT, compact, fine sand, non plastic, brown and orange brown, moist							
	SP-SAND, compact, fine grained, poorly graded, light brown, moist							
	END OF BOREHOLE @ 15.0ft BGS							
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH102-12
DATE COMPLETED: August 20, 2012
DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
2	CL-CLAY, with silt and fine to medium sand, stiff, low plasticity, brown, moist	0.70		0-2' -001				0.8
4	- brown and gray mottled at 4.0ft BGS - brown and rust brown at 4.7ft BGS			1DP	80			1.3
6	- trace fine gravel, sandy clay at 6.0ft BGS							0.4
8	- silty clay at 9.0ft BGS			2DP	75			0.6
10	- gray, green-gray and brown mottled, moderate odor at 10.0ft BGS							103
12								75.8
14				3DP 12-14' -002	95			194
16	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	15.70						192
18	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet, moderate odor	16.70		4DP	95			110
20	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	18.00 18.20 18.50 19.50 20.00						5.0
22	CL-SILTY CLAY, firm, low plasticity, brown and gray mottled, moist	20.80 21.30		5DP 22-24' -003	95			
24	SM/ML-SAND AND SILT, compact, fine sand, non plastic, gray, moist to wet							
26	CL-SILTY CLAY, stiff, low plasticity, gray, moist, slight odor	23.80						
28	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	24.80 25.00						
30	CH-CLAY, with silt, soft to firm, high plasticity, gray, moist							
32	ML-SILT, with clay, firm, non plastic, gray, moist							
34	SP-SAND, compact, fine to medium grained, poorly graded, gray, wet, no odor							
	CH-CLAY, with silt, soft to firm, high plasticity, gray, moist							
	END OF BOREHOLE @ 25.0ft BGS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH103-12
DATE COMPLETED: August 20, 2012
DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
2	SP-SAND, trace fine gravel, fine to coarse grained, poorly graded, brown, moist	0.75		0-2'-004				1.0
4				1DP		80		0.9
6	CL-SANDY CLAY, soft to firm, fine to medium sand, low plasticity, medium brown and brown mottled, moist	4.50						0.8
8				2DP		75		1.2
10	- gray and green gray, slight odor at 10.0ft BGS							37.5
12	SM/SC-SAND, with silt and clay, loose, fine grained, poorly graded, medium grain, wet, slight odor	11.50 12.20		3DP 12-14'-005		95		42.7
14	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, brown and light gray mottled, moist, slight odor							37.8
16	- sandy clay at 13.5ft BGS							42.8
18	- silty clay at 14.0ft BGS			4DP		95		70.1
20		20.00						3.3
22	SP-SAND, trace silt, compact, fine grained, poorly graded, wet, slight odor	21.50 22.30		5DP		95		
24	CH-CLAY, with silt, soft to firm, high plasticity, gray, moist							
26	ML-SILT, with clay, firm, non plastic, gray, moist							
28	CH-CLAY, with silt, soft to firm, high plasticity, gray, moist	24.50 25.00						
30	END OF BOREHOLE @ 25.0ft BGS							
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH104-12

DATE COMPLETED: August 20, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	CL-CLAY, with silt and fine to medium sand, stiff, low plasticity, brown, moist			0-2' -007				1.1
4	SP-SAND, trace silt and fine gravel, compact, fine grained, poorly graded, brown, moist, trace brick and wood debris	3.50		1DP		50		1.7
6			2" BOREHOLE					1.4
8	CL-CLAY, with silt and fine sand, firm, low plasticity, gray, green-gray and brown, moist	7.50		2DP		80		1.1
10	- silty clay, trace fine sand to fine gravel, slight odor at 10.0ft BGS		BACKFILLED WITH BENTONITE CHIPS					27.2
12								67.8
14				3DP 12-14' -008		90		
16	SP-SAND, fine to coarse grained, poorly graded, gray, wet	16.00						1.1
18	CL-SILTY CLAY, firm, low plasticity, brown and gray mottled, moist	17.50 18.00 18.50		4DP		90		1.2
20	SP-SAND, fine to coarse grained, poorly graded, brown, wet	19.30 19.80 20.30						0.8
22	CL-SILTY CLAY, firm, low plasticity, brown and gray mottled, moist							
24	SP-SAND, fine to coarse grained, poorly graded, brown, wet	22.50		5DP 22-24' -009		90		0.6
26	CL-SILTY CLAY, firm, low plasticity, brown and gray mottled, moist							
28	CH-CLAY, with silt, soft to firm, high plasticity, gray, moist	24.50 25.00						
30	ML-SILT, with clay, firm, non plastic, gray, moist							
32	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet							
34	END OF BOREHOLE @ 25.0ft BGS							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH105-12

DATE COMPLETED: August 20, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
	SP-SAND, compact, fine grained, poorly graded, dark brown, moist	0.70		0-2' -010				2.3
2	CL-SANDY CLAY, soft to firm, fine to medium sand, low plasticity, medium brown and brown mottled, moist	1.50		1DP	60			
4								2.5
6								1.6
8				2DP	80			6.6
10	CONCRETE DEBRIS	9.60						
	CL-SANDY CLAY, soft, low plasticity, rust brown and green-gray, moist, strong odor	10.00						109
12								
14	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, brown, gray and green-gray, moist, slight odor	14.00		3DP 12-14' -011	90			431
16	- brown and gray, no odor at 15.5ft BGS							4.8
18				4DP	90			
20	END OF BOREHOLE @ 20.0ft BGS	20.00		18-20' -012/ 013				3.1
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH106-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 20, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
2	SP-SAND, trace fine gravel, fine to coarse grained, poorly graded, brown, moist	0.75		1DP		50		1.4
4	CL-SANDY CLAY, soft to firm, fine to medium sand, low plasticity, medium brown and brown mottled, moist	4.00						1.7
6								
8	SP-SAND, loose, fine grained, poorly graded, black, moist, slight odor	7.00		2DP		75		85.2
10	CL-SANDY CLAY, firm, low plasticity, fine to coarse sand, gray and green-gray, moist, moderate odor	7.80						145
12								215
14	CL-SILTY CLAY, trace fine sand to fine gravel, firm, low plasticity, brown and gray mottled, moist, moderate odor	12.00		3DP		90		145
16	- 0.2' fine sand seam, gray, wet, strong odor at 12.5ft BGS							
18	- no odor at 16.0ft BGS							
20								
22								
24								
26								
28								
30								
32								
34								
	END OF BOREHOLE @ 20.0ft BGS	20.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH107-12

DATE COMPLETED: August 21, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace silt and fine gravel, compact, fine to coarse grained, poorly graded, brown, moist			1DP		80		0.8
4	CL-SANDY CLAY, trace fine gravel, firm, fine to coarse sand, low plasticity, brown and rust brown, moist - plastic sheeting at 4.2ft BGS	3.50						4.5
6								4.9
8	MIX OF SAND AND BRICK, WOOD AND CONCRETE - slight odor at 9.5ft BGS	8.00		2DP		50		13.2
10				9-11' -031				11.2
12	ML-SANDY SILT, compact, fine sand, non plastic, green-gray and brown, moist - 0.1' fine sand seam at 13.0ft BGS	11.00						
14	SP-SAND, compact, fine to medium grained, poorly graded, brown and light brown, moist - 0.2' sandy silt seam at 14.5ft BGS	13.50		3DP		80		1.1
16	END OF BOREHOLE @ 15.0ft BGS	15.00		13-15' -032				
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: BH97-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 21, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE							
2	SP-SAND, compact, fine grained, trace coarse grained and fine gravel, poorly graded, brown, moist	0.80		1DP		60		0.6
4	- 0.3' silty clay seam, firm, brown, low plasticity at 1.5ft BGS							0.4
6	- 0.3' concrete debris at 4.5ft BGS							1.6
8	- fine grained, dark brown at 5.5ft BGS			2DP		75		1.9
	- with red brick and asphalt debris at 8.0ft BGS							1.9
10	CL-CLAY, with fine to coarse sand, firm, low plasticity, dark brown, moist	9.00						2.0
12	- silty clay, trace fine sand to fine gravel, brown and dark brown at 9.8ft BGS							1.5
14	- gray and brown mottled at 11.5ft BGS			3DP 12-14' -016		90		1.3
16	- stiff, gray, brown and rust brown mottled at 14.5ft BGS							
18	- gray-brown at 18.5ft BGS			4DP 18-20' -017		90		
20	END OF BOREHOLE @ 20.0ft BGS	20.00						

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS





STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH98-12

DATE COMPLETED: August 21, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace fine gravel, silt and clay, compact, fine to coarse grained, poorly graded, medium brown, moist			0-2' -021				4.4
4	CL-SILTY CLAY, with fine sand, firm, low plasticity, brown and orange brown, moist	4.00		1DP		75		2.0
6								
8	SM/ML-SAND AND SILT, compact, fine sand, non plastic, orange brown, moist	6.50		2DP		75		1.7
10								
12	SP-SAND, compact, fine grained, poorly graded, brown and orange brown, moist - 0.2' sandy silt seam at 12.5ft BGS	11.50		9-11' -022				2.0
14	- 0.2' sandy silt seam at 14.0ft BGS			3DP		75		
16	END OF BOREHOLE @ 15.0ft BGS	15.00		13-15' -023				1.7
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BH99-12

DATE COMPLETED: August 21, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace silt and fine gravel, compact, fine to coarse grained, poorly graded, brown, moist			0-2' -024				2.3
4	SC-CLAYEY SAND, trace fine gravel, compact, fine grained, poorly graded, dark brown, moist	3.50		1DP		75		2.9
6			2" BOREHOLE					
8	SM/ML-SAND AND SILT, compact, fine sand, non plastic, orange brown, moist	7.00	BACKFILLED WITH BENTONITE CHIPS	2DP		75		2.8
10				9-11' -025				5.9
12	SM-SILTY SAND, compact, fine grained, poorly graded, brown, moist	11.50						3.2
14	ML-SANDY SILT, compact, fine sand, non plastic, brown to orange brown, moist	12.50		3DP		75		
16	SP-SAND, compact, fine to medium grained, poorly graded, light brown and brown, moist - 0.2' sandy silt seam at 13.5ft BGS - 0.2' sandy silt seam at 14.3ft BGS END OF BOREHOLE @ 15.0ft BGS	13.00 15.00		13-15' -026				2.1
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 2

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW79-12
DATE COMPLETED: August 22, 2012
DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	ASPHALT	0.50	CONCRETE	0-2' -033				2.2
4	SP-SAND, trace fine gravel, compact, fine to coarse grained, poorly graded, brown, moist		BENTONITE CHIPS	1DP		80		3.6
6			2" PVC WELL CASING					2.2
8			8-1/2" BOREHOLE	2DP		50		2.7
10	ASPHALT AND CONCRETE DEBRIS	8.00						3.6
12	SP-SAND, compact, fine to medium grained, poorly graded, black, wet	9.00						--
14	CL-SANDY CLAY, soft, low plasticity, fine to coarse sand, gray, moist to wet	11.00						1.8
16	CONCRETE DEBRIS	11.50		3DP		40		2.4
18	NO RECOVERY	12.00						2.4
20	ML-SANDY SILT, compact, fine sand, non plastic, gray, moist	15.00						2.8
22	CL-SANDY CLAY, trace silt and fine gravel, firm, low plasticity, fine to coarse sand, gray, moist	16.50		4DP 17-19' -034		90		1.8
24								1.7
26	- clay, with silt and fine sand, firm to stiff at 22.5ft BGS			20-22' -035		90		1.2
28				5DP		90		1.0
30	SP-SAND, compact, fine to medium grained, poorly graded, gray, wet	25.50	2" PVC WELL SCREEN	6DP		90		
32			SAND PACK					
34			NATURAL COLLAPSE	7DP		95		
	SM-SILTY SAND, compact, fine grained,	34.00	2-1/2" BOREHOLE					

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 2 of 2

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: MW79-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 22, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
36	poorly graded, gray, wet - 0.2' silty clay seam at 34.5ft BGS							
38	CL-CLAY, with silt and fine to coarse sand, firm, low plasticity, gray, moist - 0.2' sandy silt seam, fine sand, gray, moist at 38.0ft BGS	36.50		8DP		90		0.8
40	END OF BOREHOLE @ 40.0ft BGS	40.00						0.7
42								
44								
46								
48								
50								
52								
54								
56								
58								
60								
62								
64								
66								
68								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: MW80-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 28, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace fine gravel, compact, fine grained, poorly graded, dark brown to black, moist		CONCRETE BENTONITE CHIPS 2" PVC WELL CASING 8-1/2" BOREHOLE 2" PVC WELL SCREEN SAND PACK NATURAL COLLAPSE 2-1/2" BOREHOLE	1DP		100		0.8
4	- light and dark brown at 5.0ft BGS							1.1
6	CL-SANDY CLAY, soft to firm, fine to coarse sand, low plasticity, green-gray, moist	5.50						1.3
8	SM/SC-SAND, with silt and clay, compact, fine to coarse grained, poorly graded, brown, wet	8.00		2DP		80		1.2
10	SP-SAND, trace fine gravel, compact, fine to coarse grained, poorly graded, brown-gray, wet	10.00						1.0
12	CL-SANDY CLAY, trace silt and fine gravel, firm, fine to coarse sand, low plasticity, gray, moist	11.00						0.8
14	- 0.2' fine to coarse sand seam, gray, wet at 13.0ft BGS			3DP		80		
16	- 0.2' fine to coarse sand seam, gray, wet at 14.2ft BGS							
18	END OF BOREHOLE @ 15.0ft BGS	15.00						
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW81-12

DATE COMPLETED: August 28, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	TOPSOIL							
2	CL-SANDY CLAY, trace silt, firm, low plasticity, brown and orange brown, moist	0.70	CONCRETE	1DP		90		1.1
4			BENTONITE CHIPS					1.0
6			2" PVC WELL CASING					
8	- clay with silt and fine sand, dark brown at 8.5ft BGS		8-1/2" BOREHOLE	2DP		85		0.9
10	- brown and gray mottled at 10.0ft BGS							0.7
12				3DP		90		1.2
14	- brown and orange brown mottled at 13.2ft BGS	13.80						1.2
16	SM-SILTY SAND, compact, fine grained, poorly graded, brown-gray, wet	16.00	2" PVC WELL SCREEN	4DP		95		1.0
18	SM/ML-SANDY AND SILT, compact, fine sand, non plastic, brown-gray, wet	17.00						
20	SP-SAND, trace silt, compact, fine grained, poorly graded, gray, wet	18.80	SAND PACK					1.1
22	SM-SILTY SAND, compact, fine grained, poorly graded, brown-gray, wet	19.60						
24	SP-SAND, trace silt, compact, fine grained, poorly graded, gray, wet			5DP		90		1.6
26	- fine to medium grained at 20.5ft BGS		NATURAL COLLAPSE					
28	- 0.1' with fine gravel seam, fine to coarse sand at 22.2ft BGS	23.00						
30	- 0.1' with fine gravel seam, fine to coarse sand at 22.6ft BGS		2-1/2" BOREHOLE					1.3
32	SM/ML-SANDY AND SILT, compact, fine sand, non plastic, brown-gray, wet	25.00						
34	END OF BOREHOLE @ 25.0ft BGS							

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: MW82-12

PROJECT NUMBER: 17322

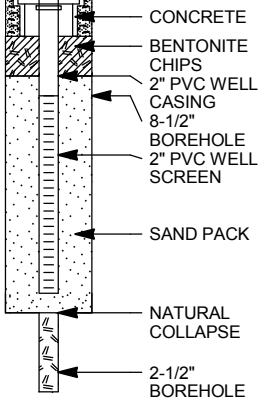
DATE COMPLETED: August 23, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	ASPHALT	0.30	 CONCRETE BENTONITE CHIPS 2" PVC WELL CASING 8-1/2" BOREHOLE 2" PVC WELL SCREEN SAND PACK NATURAL COLLAPSE 2-1/2" BOREHOLE	1DP		75		0.9
2	SM/SC-SAND, with silt, clay and fine gravel, compact, fine to coarse grained, poorly graded, brown and dark brown, moist	2.00						1.1
4	SP-SAND, trace fine gravel, compact, fine to coarse grained, poorly graded, brown, moist - wet at 4.0ft BGS			2DP		80		1.1
6	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, brown and gray, moist	6.00						0.8
8								
10	END OF BOREHOLE @ 10.0ft BGS	10.00						
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW83-12
DATE COMPLETED: August 23, 2012
DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP/GP-SAND AND GRAVEL, compact, fine to coarse sand, fine to coarse gravel, poorly graded, brown to black, moist	1.50	CONCRETE	1DP	75	75		1.1
4	SM/SC-SAND, with silt and clay, trace fine to coarse gravel, compact, fine to coarse grained, poorly graded, medium brown, moist		BENTONITE CHIPS					0.9
6			2" PVC WELL CASING	2DP	70	70		1.0
8			8-1/2" BOREHOLE					1.4
10	- wet at 8.9ft BGS		2" PVC WELL SCREEN	3DP	90	90		1.2
12	CL-CLAY, with silt and fine sand to fine gravel, soft, low plasticity, green-gray to black, wet	9.80	SAND PACK					0.7
14	- silty clay, trace fine sand to fine gravel, stiff, brown, moist at 10.2ft BGS		NATURAL COLLAPSE					
16	END OF BOREHOLE @ 15.0ft BGS	15.00	2-1/2" BOREHOLE					
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12

WELL DETAILS
Screened interval:
6.00 to 11.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 0.010
Material: PVC
Seal:
1.00 to 4.00ft BGS
Material: BENTONITE CHIPS
Sand Pack:
4.00 to 11.00ft BGS
Material: SAND



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

HOLE DESIGNATION: MW84-12

PROJECT NUMBER: 17322

DATE COMPLETED: August 28, 2012

CLIENT: ENCORE

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 10-1/2" HSA

LOCATION: PONTIAC, MICHIGAN

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP-SAND, trace silt and fine gravel, compact, fine to coarse grained, poorly graded, brown, moist		CONCRETE BENTONITE CHIPS 4" PVC WELL CASING 10-1/2" BOREHOLE	1DP				0.8
4								1.3
6	SUBMITTED TO PTS FOR CORE PHOTOGRAPHY	5.00	4" PVC WELL SCREEN SAND PACK	2DP 5-10'				0.4
8								0.6
10								103
12				3DP 10-15'				75.8
14								194
16				4DP 15-20'				192
18								
20	END OF BOREHOLE @ 20.0ft BGS	20.00						
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW85-12
DATE COMPLETED: August 23, 2012
DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA
FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	CONCRETE		CONCRETE					
2	SP-SAND, compact, fine grained, poorly graded, brown, moist - dark brown at 1.8ft BGS	0.80	BENTONITE CHIPS	1-3' -039 1DP		75		1.6
4	SM/SC-SAND, with silt and clay, trace fine gravel, compact, fine to coarse grained, poorly graded, brown, moist - wet at 5.5ft BGS	2.50	2" PVC WELL CASING 8-1/2" BOREHOLE	3-5' -040				1.4
6								
8	SC/CL-SAND AND CLAY, trace silt, compact, fine sand, non plastic, brown, moist to wet	6.80	2" PVC WELL SCREEN	2DP		90		1.2
10	SM/ML-SAND AND SILT, compact, fine sand, non plastic, brown, wet	8.00						
	CL-CLAY, with silt, firm to plastic, gray, moist	8.70	SAND PACK					1.5
	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet	9.20						
12	CL-CLAY, with silt, firm to plastic, gray, moist	11.20						1.1
	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet	12.20	NATURAL COLLAPSE	3DP		85		
14	CL-CLAY, with silt, firm to plastic, gray, moist	12.70						
	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet	13.50	2-1/2" BOREHOLE					1.2
16	CL-CLAY, with silt and fine to medium sand, firm, low plasticity, gray, moist	14.50						
18	END OF BOREHOLE @ 15.0ft BGS	15.00						
20								
22								
24								
26								
28								
30								
32								
34								

WELL DETAILS
Screened interval:
5.00 to 10.00ft BGS
Length: 5ft
Diameter: 2in
Slot Size: 0.010
Material: PVC
Seal:
1.00 to 3.80ft BGS
Material: BENTONITE CHIPS
Sand Pack:
3.80 to 9.00ft BGS
Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW86-12

DATE COMPLETED: August 24, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 10-1/2" HSA

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
2	CONCRETE	0.70	CONCRETE	1DP			
4	SP-SAND, compact, fine to coarse grained, poorly graded, light brown, moist		BENTONITE CHIPS				
6			4" PVC WELL CASING				
8	SUBMITTED TO PTS FOR CORE PHOTOGRAPHY	7.00	10-1/2" BOREHOLE	2DP			
10			4" PVC WELL SCREEN	8-10'			
12			SAND PACK	3DP	10-15'		
14				4DP	15-20'		
16							
18							
20	END OF BOREHOLE @ 20.0ft BGS	20.00					
22							
24							
26							
28							
30							
32							
34							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW87-12

DATE COMPLETED: August 23, 2012

DRILLING METHOD: DIRECT PUSH/ 2-1/2" DUAL TUBE/ 8-1/2" HSA

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	SP/GP-SAND AND GRAVEL, loose, fine to coarse sand, fine gravel, poorly graded, brown, moist	0.50	CONCRETE BENTONITE CHIPS 2" PVC WELL CASING 8-1/2" BOREHOLE 2" PVC WELL SCREEN SAND PACK NATURAL COLLAPSE 2-1/2" BOREHOLE	1-3' -036' -037' 1DP	90			1.5
	CONCRETE (PLANT FLOOR)	1.00		3-5' -035'				1.6
4	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, brown, moist			2DP	90			1.2
	SM-SILTY SAND, compact, fine grained, poorly graded, brown, wet	4.80						
6	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, brown, moist	6.20						
8	SM-SILTY SAND, compact, fine grained, poorly graded, brown, wet	8.10						1.1
10	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, gray, moist			3DP	90			0.7
	ML/CL-SILTY AND CLAY, stiff, low to non plastic, gray, moist	11.00						
12	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, gray, moist	12.80						
14	SM/ML-SAND AND SILT, compact, fine sand, gray, moist to wet	14.50						0.7
	- 0.1' fine sand seam, gray, wet at 14.2ft BGS	15.00						
16	CL-SILTY CLAY, trace fine sand to fine gravel, stiff, low plasticity, gray, moist							
18	END OF BOREHOLE @ 15.0ft BGS							
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: MW88-12

DATE COMPLETED: August 20, 2012

DRILLING METHOD: 8-1/2" HSA

FIELD PERSONNEL: D. RIVERS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
2	CONCRETE	0.70	CONCRETE				
4	CL-CLAY, with silt and fine to medium sand, stiff, low plasticity, brown, moist		BENTONITE CHIPS				
6	- brown and gray mottled at 4.0ft BGS		2" PVC WELL CASING				
8	- brown and rust brown at 4.7ft BGS		8-1/2" BOREHOLE				
10	- trace fine gravel, sandy clay at 6.0ft BGS						
12	- silty clay at 9.0ft BGS						
14	- gray, green-gray and brown mottled, moderate odor at 10.0ft BGS						
16	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	15.70					
18	SM-SILTY SAND, compact, fine grained, poorly graded, gray, wet, moderate odor	16.70					
20	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	18.00	2" PVC WELL SCREEN				
22	CL-SILTY CLAY, firm, low plasticity, brown and gray mottled, moist	18.20					
24	SM/ML-SAND AND SILT, compact, fine sand, non plastic, gray, moist to wet	18.50					
26	CL-SILTY CLAY, stiff, low plasticity, gray, moist, slight odor	19.50	SAND PACK				
28	SP-SAND, trace fine grave, compact, fine to coarse grained, poorly graded, gray, wet, strong odor	20.00					
30	END OF BOREHOLE @ 20.5ft BGS	20.50					

WELL DETAILS

Screened interval:

15.50 to 20.50ft BGS

Length: 5ft

Diameter: 2in

Slot Size: 0.010

Material: PVC

Seal:

1.00 to 14.00ft BGS

Material: BENTONITE CHIPS

Sand Pack:

15.50 to 20.50ft BGS

Material: SAND

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/18/12

APPENDIX C

DATA REVIEW AND DATA VALIDATION PERFORMED BY CRA



**CONESTOGA-ROVERS
& ASSOCIATES**

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MEMORANDUM

TO: Tom Kinney

REF. NO.: 017322

FROM: Paul Wiseman/ma/17/Det. 

DATE: January 18, 2013

E-Mail and Hard Copy if Requested

RE: **Analytical Data Quality Assessment and Reduced/Full Validation
Phase III Environmental Assessment
PCC Validation
Pontiac, Michigan
August and December 2012**

INTRODUCTION

The following document details a data quality assessment and reduced/full validation of analytical results for soil and groundwater samples collected in support of the Phase III Environmental Assessment at the PCC Validation Site during August and December 2012. Samples were submitted to ALS, located in Holland, Michigan (ALS-Holland). A sample collection and analysis summary is presented in Table 1 and Table 2 for groundwater and soil samples, respectively. A summary of the analytical methodology is presented in Table 3.

Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, duplicate data, recovery data from surrogate spikes, laboratory control samples (LCS), and matrix spike samples (MS); and field quality assurance/quality control (QA/QC) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses); adherence to accuracy and precision criteria; and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 2 and the documents entitled:

- i) "Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan", April 2012
- ii) "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540/R-99-008, October 1999
- iii) "USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review", USEPA 540/R-94-013, February 1994

Items ii) and iii) will subsequently be referred to as the "Guidelines" in this Memorandum.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. The data quality assessment and reduced/full validation presented in the following subsections were

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performed with a full validation on 10% of the laboratory deliverables as noted and specified in Table 1, and a reduced validation on all based on the sample results, supporting quality assurance/quality control (QA/QC) and all raw data provided.

SAMPLE HOLDING TIME AND PRESERVATION

The sample holding time criteria and sample preservation requirements for the analyses are summarized in Table 2. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were prepared and analyzed within the required holding times.

All samples were properly preserved and delivered on ice, stored by the laboratory at the required temperature (0-6°C) and analyzed within the specified holding time periods.

GAS CHROMATOGRAPHY/MASS SPECTROMETER (GC/MS) - TUNING AND MASS CALIBRATION (INSTRUMENT PERFORMANCE CHECK) AND INDUCTIVELY COUPLED PLASMA/MASS SPECTROMETER (ICP/MS) - FULL VALIDATION

Organic Analyses

Prior to volatile organic compound (VOC) and semi-volatile organic compound (SVOC) analysis, GC/MS instrumentation is tuned to ensure optimization over the mass range of interest. To evaluate instrument tuning, methods require the analysis of specific tuning compounds bromofluorobenzene (BFB) and decafluorotriphenylphosphine (DFTPP), respectively. The resulting spectra must meet the criteria cited in the methods before analysis is initiated. Analysis of the tuning compound must then be repeated every 12 hours throughout sample analysis to ensure the continued optimization of the instrument.

Tuning compounds were analyzed at the required frequency throughout the volatile and semi-volatile analysis periods. All tuning criteria were met, indicating that proper optimization of the instrumentation was achieved.

Inorganic Analyses

To ensure adequate mass resolution, identification, and to some degree, sensitivity; the performance of each ICP/MS instrument used for metals analyses is checked prior to calibration and initiating an analysis sequence through the analysis of a tuning solution.

Instrument performance check data were reviewed. The tuning solution was analyzed at the required frequency throughout the analyses. The results of all instrument performance checks were within the method acceptance criteria, indicating that proper optimization of the instrumentation was achieved.

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INITIAL CALIBRATION - ORGANIC ANALYSES - FULL VALIDATION

GC/MS

To quantify VOC and SVOC compounds of interest in samples, calibration of the GC/MS over a specific concentration range must be performed. Initially, a five-point calibration curve containing all compounds of interest is analyzed to characterize instrument response for each analyte over a specific concentration range. Linearity of the calibration curve and instrument sensitivity are evaluated against the following criteria:

- i) All relative response factors (RRFs) must be greater than or equal to 0.05
- ii) The percent relative standard deviation (RSD) values must not exceed 30.0 percent or a minimum coefficient of determination of 0.99 if quadratic equation calibration curves are used

The initial calibration data for VOCs and SVOCs were reviewed. All compounds met the above criteria for sensitivity and linearity.

GC

In order to quantify organic compounds of interest by GC, calibration of the gas chromatograph over a specific concentration range must be performed. Initially, a calibration curve consisting of a minimum of five concentration levels is analyzed for all single component compounds of interest and for polychlorinated biphenyls (PCBs) (Aroclors 1016 and 1260). A single calibration standard is analyzed for all other multi-response compounds. Linearity of the calibration curve is acceptable if all RSD values are less than or equal to 20.0 percent or if the correlation coefficient is 0.995 or greater for linear regression curves.

Retention time windows are also calculated from the initial calibration analyses. These windows are then used to identify all compounds of interest in subsequent analyses.

All initial calibration standards were analyzed at the required frequencies. All retention time, peak resolution and linearity criteria were satisfied as specified in the methods.

INITIAL CALIBRATION - INORGANIC ANALYSES - FULL VALIDATION

Initial calibration of the instruments ensures that they are capable of producing satisfactory quantitative data at the beginning of a series of analyses. For Inductively Coupled Plasma (ICP & ICP/MS) analysis, a calibration blank and at least one standard must be analyzed at each wavelength to establish the analytical curve. For mercury atomic absorption (AA) analyses, a calibration blank and a minimum of five standards must be analyzed to establish the analytical curve and resulting correlation coefficients must be 0.995 or greater. For instrumental general chemistry analyses, a calibration blank and a minimum of five, this could vary by method, standards must be analyzed to establish the analytical curve and resulting correlation coefficients must be 0.995 or greater.

CRA MEMORANDUM

After the analyses of the calibration curves, an initial calibration verification (ICV) standard must be analyzed to verify the analytical accuracy of the calibration curves. All analyte recoveries from the analyses of the ICVs must be within the following control limits:

<i>Analytical Method</i>	<i>Parameter</i>	<i>Control Limits</i>
ICP/AA	Metals	90 - 110%
Cold Vapor AA	Mercury	80 - 120%
Instrumental Wet Chemistry	List	85 - 115%

Upon review of the data, it was determined that the calibration curves and ICVs were analyzed at the proper frequencies and that all of the above-specified criteria were met.

CONTINUING CALIBRATION - ORGANICS ANALYSES - FULL VALIDATION

GC/MS

To ensure that instrument calibration for VOC and SVOC analyses is acceptable throughout the sample analysis period, continuing calibration standards must be analyzed and compared to the initial calibration curve every 12 hours.

The following criteria were employed to evaluate continuing calibration data:

- i) All RRF values must be greater than or equal to 0.05
- ii) Percent difference (%D) values must not exceed 25 percent

Calibration standards were analyzed at the required frequency, and the results met the above criteria for instrument sensitivity and stability with the exception of the qualified samples presented in Table 4.

GC

To ensure that the calibration of the instrument for organic analyses by GC is valid throughout the sample analysis period, continuing calibration standards are analyzed and evaluated on a regular basis. To evaluate the continued linearity of the calibration, %D values are calculated for each compound. As specified in the methods, all %D values should not exceed 15 percent. To ensure that compound retention times do not vary over the analysis period, all retention times for continuing calibration compounds must fall within the established retention time windows.

All continuing calibration standards were analyzed at the required frequency. All %D values and compound retention times met the above criteria indicating acceptable instrument calibration throughout the analysis period.

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CONTINUING CALIBRATION - INORGANIC ANALYSES - FULL VALIDATION

To ensure that instrument calibration is acceptable throughout the sample analysis period, continuing calibration verification (CCV) standards are analyzed on a regular basis. Each CCV is deemed acceptable if all analyte recoveries are within the control limits specified above for the ICVs. If some of the CCV analyte recoveries are outside the control limits, samples analyzed before and after the CCV, up until the previous and proceeding CCV analyses, are affected.

For this study, CCVs were analyzed at the proper frequency. All analyte recoveries reported for the CCVs were within the specified limits.

CONTRACT REQUIRED DETECTION LIMIT (CRDL) STANDARD ANALYSES - FULL VALIDATION

To verify the linearity of the ICP & ICP/MS calibration near the detection limit, a standard is analyzed which contains the ICP & ICP/MS analytes at specified concentrations. This standard must be analyzed at the beginning and end of each sample analysis run or a minimum of twice per 8-hour period.

CRDL recoveries were evaluated using the criteria specified in the October 2004 "Guidelines". The CRDL recoveries were acceptable.

LABORATORY BLANK ANALYSES

Method preparation blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures. Additionally, initial and continuing calibration blanks (ICBs/CCBs) are routinely analyzed after each ICV/CCV for the inorganic parameters.

For this study, laboratory method blanks were analyzed at a minimum frequency of one per 20 investigative samples and/or one per analytical batch.

Organic Analyses

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

The samples presented in Table 5 were qualified due to laboratory contamination. The laboratory flagged the concentrations with a "B" which may be disregarded. The remaining method blank samples did not contain target compounds with concentrations that impacted the investigative samples.

Inorganic Analyses

Upon review of the ICBs, CCBs, and preparation blanks, it was noted that metal concentrations were observed above the method detection limit (MDL). Most investigative samples associated with the low level detections reported either non-detect concentrations or concentrations significantly greater than the associated laboratory blank concentrations for the analytes of interest. These sample results were not

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impacted by the contamination detected. Associated positive sample results with similar concentrations to the levels reported in the blanks were qualified non-detect as presented in Table 6.

SURROGATE SPIKE RECOVERIES

In accordance with the methods employed, all samples, blanks and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of ALS-Holland performance on individual sample matrices.

All samples submitted for VOC, SVOC and PCB determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Each individual surrogate compound is expected to meet the laboratory (method) control limits with the exception of SVOC analyses. According to the "Guidelines" for SVOC analyses, up to one outlying surrogate in the base/neutral or acid fractions is acceptable as long as the recovery is at least 10 percent.

Surrogate recoveries were assessed against laboratory (method) control limits. All surrogate recoveries met the above criteria with the exception of the qualified samples presented in Table 7.

INTERNAL STANDARDS (IS) ANALYSES - FULL VALIDATION

Internal standard data were evaluated for all VOC, SVOC and ICP/MS metals sample analyses.

Organics Analyses

To ensure that changes in the GC/MS sensitivity and response do not affect sample analysis results, internal standard compounds are added to each sample prior to analysis. All results are then calculated as a ratio of the internal standard responses.

The sample internal standard results were evaluated against the following criteria:

- i) the retention time of the internal standard must not vary more than ± 30 seconds from the associated calibration standard
- ii) internal standard area counts must not vary by more than a factor of two (-50 percent to +100 percent) from the associated calibration standard

All organic internal standard recoveries and retention times met the above criteria.

Inorganic Analyses

Internal standard elements were added to all samples prior to metals analysis by ICP/MS. Overall instrument stability and performance for metals analyses were monitored using the internal standard intensity data. Internal standard recoveries were assessed using control limits of 60-125%.

All inorganic internal standard recoveries were acceptable, demonstrating adequate analytical performance.

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LABORATORY CONTROL SAMPLE (LCS) ANALYSES

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, LCS was analyzed at a minimum frequency of one per 20 investigative samples and/or one per analytical batch.

Organic Analyses

The LCS contained all compounds of interest. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

Inorganic Analyses

The LCS contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

MATRIX SPIKE/MATRIX SPIKE DUPLICATE (MS/MSD) ANALYSES - ORGANIC ANALYSES

To evaluate the effects of sample matrices on the extraction or digestion process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS/MSD samples. The relative percent difference (RPD) between the MS and MSD is used to assess analytical precision. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

MS/MSD analyses were performed as specified in Table 1. The laboratory performed additional site-specific MS/MSD analyses internally.

Organic Analyses

The MS/MSD samples were spiked with all compounds of interest. All percent recoveries and RPD values were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

Inorganic Analyses

The MS/MSD samples were spiked with the analytes of interest and the results were evaluated using the "Guidelines". All percent recoveries and RPD values were within the control limits, demonstrating acceptable analytical accuracy and precision.

ICP AND ICP/MS SERIAL DILUTION - INORGANIC ANALYSES - FULL VALIDATION

The serial dilution determines whether significant physical or chemical interferences exist due to sample matrix. A minimum of one per 20 investigative samples or at least one per analytical batch must be analyzed at a five-fold dilution. For samples with sufficient analyte concentrations (> 50 times the instrument detection limit), the serial dilution results must agree within 10 percent of the original results.

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The percent D acceptance criteria was met.

ICP INTERFERENCE CHECK SAMPLE ANALYSIS (ICS) - INORGANIC ANALYSES - FULL VALIDATION

To verify that the laboratory has established proper inter-element and background correction factors, ICSs are analyzed. These samples contain high concentrations of aluminum, calcium, magnesium and iron and are analyzed at the beginning and end of each sample analysis period. The ICSs are evaluated against recovery control limits of 80 to 120 percent.

ICS analysis results were evaluated for all samples using the criteria in the "Guidelines". All ICS recoveries and results were acceptable.

FIELD QA/QC SAMPLES

The field QA/QC consisted of six (6) trip blank samples, and five (5) field duplicate sample sets.

Trip Blank Sample Analysis

To evaluate contamination from sample collection, transportation, storage, and analytical activities, six (6) trip blanks were collected and submitted to the laboratory for VOC analysis.

The samples that were qualified due to trip blank contamination are summarized in Table 8. The remaining trip blank samples did not contain target compounds with concentrations that impacted the investigative samples.

Field Duplicate Sample Analysis

To assess the analytical and sampling protocol precision, five (5) field duplicate samples were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 50 and 100 percent for water and soil samples, respectively. If the reported concentration in either the investigative sample or its duplicate is less than five times the RL, the evaluation criteria is one or two times the RL value for water and soil samples, respectively.

All field duplicate results were within acceptable agreement, demonstrating acceptable sampling and analytical precision.

ANALYTE REPORTING

Non-detect data were reported down to the laboratory's method detection limit (MDL) for each analyte. Positive analyte detections less than the practical quantitation limit (PQL) but greater than the MDL were qualified as estimated (J).

All soil results were reported on a dry (wet) weight basis.

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TARGET COMPOUND IDENTIFICATION

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time and mass spectra (if applicable) were evaluated according to the identification criteria established by the methods. The samples identified in Table 1 were reviewed. The organic compounds reported adhered to the specified identification criteria.

CONCLUSION

Based on this assessment, the data produced by ALS-Holland were found to exhibit acceptable levels of accuracy and precision based on the provided information and may be used without qualification.

Based on this assessment, the data produced by ALS-Holland were found to exhibit acceptable levels of accuracy and precision based on the provided information and may be used with the qualifications noted with the exception of the following:

- SVOC data were rejected in one of samples, due to surrogate recovery violations

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

						Analysis/Parameters			
Sample Identification	Location	Matrix	QC Samples	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	TCL VOC	TCL SVOC	TCL PCB	TAL Metals
ALS SDG No.: 1208895 ¹									
GW-17322-082812-DD-036	MW-2-07	water	MS/MSD	8/28/2012	9:20:00 AM	X		X	
GW-17322-082812-DD-037	MW-37-07	water	MS/MSD	8/28/2012	11:25:00 AM		X		
GW-17322-082812-DD-038	MW-64-08	water		8/28/2012	1:05:00 PM	X	X		
GW-17322-082812-DD-039	MW-63-08	water		8/28/2012	1:40:00 PM	X	X		
GW-17322-082812-DD-040	MW-68-08	water		8/28/2012	2:25:00 PM	X	X		
GW-17322-082812-DD-041	MW-74-08	water		8/28/2012	3:10:00 PM	X	X		
TripBlank	--	water	Trip Blank	8/28/2012	8/28/2012	X			
GW-17322-082912-DD-042	MW-79-12	water		8/29/2012	9:05:00 AM	X		X	
GW-17322-082912-DD-043	MW-83-12	water	MS/MSD-P	8/29/2012	10:45:00 AM	X	X	X	X
ALS SDG No.: 1208901									
GW-17322-082912-DD-044	MW-88-12	water	MS/MSD-P	8/29/2012	2:15:00 PM	X	X	X	
GW-17322-082912-DD-045	MW-85-12	water		8/29/2012	5:20:00 PM	X	X	X	X
GW-17322-083012-DD-046	MW-81-12	water		8/30/2012	8:40:00 AM	X	X	X	X
GW-17322-083012-DD-049	MW-80-12	water		8/30/2012	8:50:00 AM	X	X	X	X
GW-17322-083012-DD-050	MW-82-12	water		8/30/2012	9:35:00 AM	X	X	X	X
GW-17322-083012-DD-047	MW-84-12	water		8/30/2012	9:55:00 AM	X	X	X	X
GW-17322-083012-DD-048	MW-84-12	water	DUP (-047)	8/30/2012	10:10:00 AM	X	X	X	X
GW-17322-083012-DD-051	MW-87-12	water		8/30/2012	10:20:00 AM	X	X	X	X
TripBlank	--	water	Trip Blank	8/30/2012	8/30/2012	X			

TABLE 1

SAMPLE COLLECTION AND ANALYSIS SUMMARY - GROUNDWATER SAMPLES
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

						Analysis/Parameters			
Sample Identification	Location	Matrix	QC Samples	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	TCL VOC	TCL SVOC	TCL PCB	TAL Metals
ALS SDG No.: 1212315									
GW-17322-120512-CT-021	TMW1I-12	water	MS/MSD	12/5/2012	1:20:00 PM	X			
GW-17322-120512-CT-022	TMW1S-12	water		12/5/2012	2:30:00 PM	X			
TB-17322-120512	--	water	Trip Blank	12/5/2012	12/5/2012	X			
GW-17322-120612-CT-023	MW-91-12	water		12/6/2012	3:40:00 PM	X	X		
GW-17322-120612-CT-024	MW-89-12	water	MS/MSD	12/6/2012	4:25:00 PM		X		
GW-17322-120712-CT-025	TMW4I-12	water		12/7/2012	1:10:00 PM	X			
GW-17322-120712-CT-026	TMW3I-12	water		12/7/2012	1:40:00 PM	X			
GW-17322-120712-CT-027	TMW2S-12	water		12/7/2012	2:45:00 PM	X			
GW-17322-120712-CT-028	TMW2I-12	water		12/7/2012	2:50:00 PM	X			
GW-17322-120712-CT-029	MW-90-12	water		12/7/2012	4:10:00 PM	X	X		

Notes:

- (1) The full data validation was completed on this SDG
 DUP - Field Duplicate Sample of sample in parenthesis
 MS/MSD - Matrix Spike/Matrix Spike Duplicate
 MS/MSD-P - Matrix Spike/Matrix Spike Duplicate (Partial parameters)
 PCB - Polychlorinated biphenyls
 QC - Quality Control
 SVOC - Semivolatile Organic Compounds
 TAL - Target Analyte List
 TCL - Target Compound List
 VOC - Volatile Organic Compounds

TABLE 2

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL SAMPLES
PHASE III ENVIRONMENTAL ASSESSMENT
PCC VALIDATION
PONTIAC, MICHIGAN

								Analysis/Parameters			
Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	QC Samples	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	TCL VOC	TCL SVOC	TCL PCB	TAL Metals
ALS SDG No. 1208748											
SO-17322-082012-DR-001	BH-102-12	soil	0	2	MS/MSD-P	8/20/2012	10:40:00 AM				X
SO-17322-082012-DR-002	BH-102-12	soil	12	14		8/20/2012	10:50:00 AM	X	X		X
SO-17322-082012-DR-003	BH-102-12	soil	22	24		8/20/2012	11:15:00 AM				X
SO-17322-082012-DR-004	BH-103-12	soil	0	2		8/20/2012	11:40:00 AM				X
SO-17322-082012-DR-005	BH-103-12	soil	12	14	DUP (-012)	8/20/2012	11:50:00 AM	X	X		X
SO-17322-082012-DR-006	BH-103-12	soil	23	25		8/20/2012	12:15:00 PM				X
SO-17322-082012-DR-007	BH-104-12	soil	0	2		8/20/2012	1:30:00 PM				X
SO-17322-082012-DR-008	BH-104-12	soil	12	14		8/20/2012	1:45:00 PM	X	X		X
SO-17322-082012-DR-009	BH-104-12	soil	22	24		8/20/2012	1:55:00 PM				X
SO-17322-082012-DR-010	BH-105-12	soil	0	2		8/20/2012	2:15:00 PM				X
SO-17322-082012-DR-011	BH-105-12	soil	12	14		8/20/2012	2:30:00 PM	X	X		X
SO-17322-082012-DR-012	BH-105-12	soil	18	20		8/20/2012	2:40:00 PM				X
SO-17322-082012-DR-013	BH-105-12	soil	18	20		8/20/2012	2:45:00 PM				X
SO-17322-082012-DR-014	BH-106-12	soil	15	17		8/20/2012	3:15:00 PM				X
SO-17322-082012-DR-015	BH-106-12	soil	18	20	MS/MSD	8/20/2012	3:20:00 PM				X
SO-17322-082112-DR-016	BH-97-12	soil	12	14	MS/MSD	8/21/2012	9:45:00 AM	X	X		X
SO-17322-082112-DR-017	BH-97-12	soil	18	20		8/21/2012	9:50:00 AM	X	X		X
SO-17322-082112-DR-018	BH-101-12	soil	0	2		8/21/2012	10:25:00 AM		X		
SO-17322-082112-DR-019	BH-101-12	soil	9	11		8/21/2012	10:30:00 AM		X		
SO-17322-082112-DR-020	BH-101-12	soil	13	15	MS/MSD	8/21/2012	10:35:00 AM		X		
SO-17322-082112-DR-021	BH-98-12	soil	0	2		8/21/2012	10:50:00 AM		X		
SO-17322-082112-DR-022	BH-98-12	soil	9	11		8/21/2012	10:55:00 AM		X		
SO-17322-082112-DR-023	BH-98-12	soil	13	15		8/21/2012	11:00:00 AM		X		
SO-17322-082112-DR-024	BH-99-12	soil	0	2		8/21/2012	11:15:00 AM		X		
SO-17322-082112-DR-025	BH-99-12	soil	9	11		8/21/2012	11:20:00 AM		X		
SO-17322-082112-DR-026	BH-99-12	soil	13	15		8/21/2012	11:25:00 AM		X		
SO-17322-082112-DR-027	BH-100-12	soil	0	2		8/21/2012	11:30:00 AM		X		
SO-17322-082112-DR-028	BH-100-12	soil	9	11		8/21/2012	11:35:00 AM		X		

TABLE 2

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL SAMPLES
PHASE III ENVIRONMENTAL ASSESSMENT
PCC VALIDATION
PONTIAC, MICHIGAN

								Analysis/Parameters			
Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	QC Samples	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	TCL VOC	TCL SVOC	TCL PCB	TAL Metals
ALS SDG No. 1208748 (Continued)											
SO-17322-082112-DR-029	BH-100-12	soil	13	15	DUP (-029)	8/21/2012	11:40:00 AM		X		
SO-17322-082112-DR-030	BH-100-12	soil	13	15		8/21/2012	11:45:00 AM		X		
SO-17322-082112-DR-031	BH-107-12	soil	9	11		8/21/2012	12:10:00 PM		X		
SO-17322-082112-DR-032	BH-107-12	soil	13	15		8/21/2012	12:40:00 PM		X		
SO-17322-082112-DR-033	MW-79-12	soil	0	2		8/21/2012	2:10:00 PM	X		X	
SO-17322-082112-DR-034	MW-79-12	soil	17	19		8/21/2012	2:45:00 PM	X		X	
SO-17322-082112-DR-035	MW-79-12	soil	20	22		8/21/2012	3:00:00 PM	X		X	
TripBlank	--	soil	--	--	Trip Blank	8/21/2012	8/21/2012	X			
ALS SDG No. 1208783											
SO-17322-082312-DR-036	MW-87-12	soil	1	3	DUP (-036)	8/23/2012	11:45:00 AM	X	X	X	X
SO-17322-082312-DR-037	MW-87-12	soil	1	3		8/23/2012	11:50:00 AM	X	X	X	X
SO-17322-082312-DR-038	MW-87-12	soil	3	5		8/23/2012	11:55:00 AM	X	X	X	X
SO-17322-082312-DR-039	MW-85-12	soil	1	3	MS/MSD	8/23/2012	5:45:00 PM	X	X	X	X
SO-17322-082312-DR-040	MW-85-12	soil	3	5		8/23/2012	5:55:00 PM	X	X	X	X
TripBlank	--	soil	--	--	Trip Blank	8/23/2012	8/23/2012	X			
ALS SDG No. 1212220 ¹											
S-17322-120412-DD-001	TMW4S-12	soil	8		Trip Blank	12/4/2012	10:00:00 AM	X			
S-17322-120412-DD-002	TMW3S-12	soil	7.5			12/4/2012	11:00:00 AM	X			
S-17322-120412	--	soil	--	--		12/4/2012	12/4/2012	X			
S-17322-120512-DD-005	SB112-12	soil	5.5			12/5/2012	8:40:00 AM	X	X	X	X
S-17322-120512-DD-006	SB112-12	soil	16		MS/MSD-P	12/5/2012	9:20:00 AM	X	X	X	X
S-17322-120512-DD-007	SB113-12	soil	17			12/5/2012	10:20:00 AM	X	X	X	X

TABLE 2

SAMPLE COLLECTION AND ANALYSIS SUMMARY - SOIL SAMPLES
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

								Analysis/Parameters			
Sample Identification	Location	Matrix	Initial Sample Depth (ft. bgs)	Final Sample Depth (ft. bgs)	QC Samples	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	TCL VOC	TCL SVOC	TCL PCB	TAL Metals
ALS SDG No. 1212219											
S-17322-120512-DD-008	SB109-12	soil	0	2		12/5/2012	11:05:00 AM		X		
S-17322-120512-DD-009	SB109-12	soil	3	4		12/5/2012	11:10:00 AM		X		
S-17322-120512-DD-010	SB110-12	soil	0	2		12/5/2012	11:15:00 AM		X		
S-17322-120512-DD-011	SB110-12	soil	3	4		12/5/2012	11:20:00 AM		X		
S-17322-120512-DD-012	SB111-12	soil	0	2		12/5/2012	11:25:00 AM		X		
S-17322-120512-DD-013	SB111-12	soil	0	2	DUP (-012)	12/5/2012	11:30:00 AM		X		
S-17322-120512-DD-014	SB111-12	soil	3	4	MS/MSD	12/5/2012	11:35:00 AM		X		
S-17322-120512-DD-017	SB115-12	soil	0	2		12/5/2012	11:50:00 AM		X		
S-17322-120512-DD-018	SB115-12	soil	3	4		12/5/2012	11:55:00 AM		X		

Notes:

- (1) The full data validation was completed on this SDG
 DUP - Field Duplicate Sample of sample in parenthesis
 MS/MSD - Matrix Spike/Matrix Spike Duplicate
 MS/MSD-P - Matrix Spike/Matrix Spike Duplicate (Partial parameters)
 PCB - Polychlorinated biphenyls
 QC - Quality Control
 SVOC - Semivolatile Organic Compounds
 TAL - Target Analyte List
 TCL - Target Compound List
 VOC - Volatile Organic Compounds

TABLE 3

SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Method</i> ¹	<i>Matrix</i>	<i>Holding Time</i>	<i>Preservation</i> ²
TCL VOC	SW-846 8260	Water	- 14 days from sample collection to completion of analysis.	pH < 2 and Iced, 4 ± 2° C
	SW-846 8260B	Soil	- 48 hours from sample collection to preservation - 14 days from sample preservation to completion of analysis	Iced, 4 ± 2° C
TCL SVOC	SW-846 8270C	Water	- 7 days from sample collection to extraction - 40 days from extraction to completion of analysis	Iced, 4 ± 2° C
	SW-846 8270C	Soil	- 14 days from sample collection to extraction - 40 days from extraction to completion of analysis	Iced, 4 ± 2° C
PCB	SW-846 8082	Water	- 7 days from sample collection to extraction - 40 days from extraction to completion of analysis	Iced, 4 ± 2° C
	SW-846 8082	Soil	- 14 days from sample collection to extraction - 40 days from extraction to completion of analysis	Iced, 4 ± 2° C
TAL Metals		Water/Soil	- 180 days from sample collection to completion of analysis	pH < 2 and Iced, 4 ± 2° C
Aluminum	SW-846 6020			
Antimony	SW-846 6020			
Arsenic	SW-846 6020			
Barium	SW-846 6020			
Beryllium	SW-846 6020			
Cadmium	SW-846 6020			
Chromium	SW-846 6020			
Cobalt	SW-846 6020			
Copper	SW-846 6020			
Iron	SW-846 6020			
Lead	SW-846 6020			
Manganese	SW-846 6020			
Nickel	SW-846 6020			
Selenium	SW-846 6020			
Silver	SW-846 6020			
Thallium	SW-846 6020			
Vanadium	SW-846 6020			
Zinc	SW-846 6020			

TABLE 3

SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Method</i> ¹	<i>Matrix</i>	<i>Holding Time</i>	<i>Preservation</i> ²
TAL Metals (Continued)				
Mercury	SW-846 7470A/7471A	Water	- 28 days from sample collection to completion of analysis	pH < 2 and Iced, 4 ± 2° C

Notes

² pH preservation is not required in soil samples.

¹ Method References:

SW-846 - "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", SW-846, 3rd Edition, and Promulgated updates, November 1986

SM - "Standards Methods for the Examination of Water and Wastewater," APHA, 19th Edition, 1995

TABLE 4

**QUALIFIED SAMPLE RESULTS DUE TO VIOLATION OF CONTINUING CALIBRATION REQUIREMENTS
PHASE III ENVIRONMENTAL ASSESSMENT
PCC VALIDATION
PONTIAC, MICHIGAN**

<i>Parameter</i>	<i>Analyte</i>	<i>Calibration Date</i>	<i>RRF</i>	<i>% Recovery or %D</i>	<i>Associated Sample ID</i>	<i>Qualified Result</i>	<i>Units</i>
TCL VOC	Chloroethane	8/31/2012	---	43.4	GW-17322-082812-DD-036	5.0 UJ	µg/L
					GW-17322-082812-DD-038	5.0 UJ	µg/L
					GW-17322-082812-DD-039	5.0 UJ	µg/L
					GW-17322-082812-DD-040	5.0 UJ	µg/L
					GW-17322-082912-DD-043	5.0 UJ	µg/L
TCL VOC	Cyclohexane	8/31/2012	---	26.1	GW-17322-082812-DD-036	1.0 UJ	µg/L
					GW-17322-082812-DD-038	1.0 UJ	µg/L
					GW-17322-082812-DD-039	1.0 UJ	µg/L
					GW-17322-082812-DD-040	1.0 UJ	µg/L
					GW-17322-082912-DD-043	1.0 UJ	µg/L
TCL VOC	Dichlorodifluoromethane	8/31/2012	---	31.5	GW-17322-082812-DD-036	5.0 UJ	µg/L
					GW-17322-082812-DD-038	5.0 UJ	µg/L
					GW-17322-082812-DD-039	5.0 UJ	µg/L
					GW-17322-082812-DD-040	5.0 UJ	µg/L
					GW-17322-082912-DD-043	5.0 UJ	µg/L
TCL VOC	Bromomethane	12/11/2012	---	37.7	S-17322-120412-DD-001	89 UJ	µg/kg
					S-17322-120412-DD-002	91 UJ	µg/kg
					S-17322-120512-DD-005	160 UJ	µg/kg
					S-17322-120512-DD-006	86 UJ	µg/kg
					S-17322-120512-DD-007	93 UJ	µg/kg
TCL VOC	Dichlorodifluoromethane	12/11/2012	---	27.4	S-17322-120412-DD-001	36 UJ	µg/kg
					S-17322-120412-DD-002	36 UJ	µg/kg
					S-17322-120512-DD-005	63 UJ	µg/kg
					S-17322-120512-DD-006	34 UJ	µg/kg
					S-17322-120512-DD-007	37 UJ	µg/kg

Notes:

UJ - Non-detect with an Estimated Report Limit
RRF - Relative Response Factor
%D - Percent Difference
TCL - Target Compound List
VOC - Volatile Organic Compounds

TABLE 5

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Analysis Date</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Original Result</i>	<i>Qualified Result</i>	<i>Units</i>
TCL VOC	Acetone	8/24/2012	100	SO-17322-082012-DR-002	120 B	120 U	µg/kg
				SO-17322-082012-DR-005	180 B	180 U	µg/kg
				SO-17322-082012-DR-008	120 B	120 U	µg/kg
				SO-17322-082012-DR-011	150 B	150 U	µg/kg
				SO-17322-082112-DR-016	100 J	120 U	µg/kg
				SO-17322-082112-DR-017	87 J	120 U	µg/kg
				SO-17322-082112-DR-033	75 J	110 U	µg/kg
				SO-17322-082112-DR-034	160 B	160 U	µg/kg
				SO-17322-082112-DR-035	110 J	110 U	µg/kg
TCL VOC	Acetone	8/28/2012	169	SO-17322-082312-DR-036	350 B	350 U	µg/kg
			279.5	SO-17322-082312-DR-037	330 B	330 U	µg/kg
			220	SO-17322-082312-DR-038	300 B	300 U	µg/kg
				SO-17322-082312-DR-039	310 B	310 U	µg/kg
				SO-17322-082312-DR-040	250 B	250 U	µg/kg
TCL VOC	Chloromethane	8/28/2012	66.5	SO-17322-082312-DR-036	220	220 U	µg/kg
			130	SO-17322-082312-DR-037	210	210 U	µg/kg
				SO-17322-082312-DR-038	190	190 U	µg/kg
				SO-17322-082312-DR-039	150	150 U	µg/kg
				SO-17322-082312-DR-040	180	180 U	µg/kg
TCL SVOC	bis(2-Ethylhexyl)phthalate	8/30/2012	27.67 J	SO-17322-082112-DR-032	19 J	360 U	µg/kg
				SO-17322-082312-DR-036	29 J	360 U	µg/kg
				SO-17322-082312-DR-037	25 J	370 U	µg/kg
				SO-17322-082312-DR-038	24 J	360 U	µg/kg
				SO-17322-082312-DR-039	42 J	360 U	µg/kg
				SO-17322-082312-DR-040	47 J	350 U	µg/kg

TABLE 5

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO METHOD BLANK CONTAMINATION
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Analysis Date</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Original Result</i>	<i>Qualified Result</i>	<i>Units</i>
TCL SVOC	Caprolactam	8/30/2012	140.7 J	SO-17322-082112-DR-032	330 J	360 U	µg/kg
				SO-17322-082312-DR-036	230 J	360 U	µg/kg
				SO-17322-082312-DR-037	260 J	370 U	µg/kg
				SO-17322-082312-DR-038	190 J	360 U	µg/kg
				SO-17322-082312-DR-039	190 J	360 U	µg/kg
				SO-17322-082312-DR-040	260 J	350 U	µg/kg
TCL SVOC	Di-n-butylphthalate	8/30/2012	30.33 J	SO-17322-082312-DR-036	33 J	360 U	µg/kg
				SO-17322-082312-DR-037	34 J	370 U	µg/kg
				SO-17322-082312-DR-038	33 J	360 U	µg/kg
				SO-17322-082312-DR-039	39 J	360 U	µg/kg
				SO-17322-082312-DR-040	34 J	350 U	µg/kg
TAL Metals	Chromium	9/11/2012	0.0001953 J	GW-17322-082912-DD-043	0.00096 J	0.0050 U	mg/kg
				GW-17322-082912-DD-044	0.00094 J	0.0050 U	mg/kg
				GW-17322-083012-DD-047	0.00094 J	0.0050 U	mg/kg
				GW-17322-083012-DD-049	0.00097 J	0.0050 U	mg/kg
				GW-17322-083012-DD-051	0.00084 J	0.0050 U	mg/kg
TAL Metals	Zinc	9/11/2012	0.001042 J	GW-17322-082912-DD-043	0.0046 J	0.010 U	mg/kg
				GW-17322-083012-DD-049	0.0021 J	0.010 U	mg/kg
				GW-17322-083012-DD-051	0.0030 J	0.010 U	mg/kg

Notes:

U - Qualified as Not Detected at the report limit

J - Estimated Concentration

B - Laboratory qualifier - result detected in associated with method blank

TAL - Target Analyte List

TCL - Target Compound List

VOC - Volatile Organic Compounds

TABLE 6

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO LABORATORY BLANK CONTAMINATION
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Analysis Date</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Original Result</i>	<i>Qualified Result</i>	<i>Units</i>
TAL Metals	Zinc	9/11/2012	0.001042 J	GW-17322-082912-DD-043	0.0046 J	0.010 U	mg/kg
				GW-17322-082912-DD-044	0.0056 J	0.010 U	mg/kg
				GW-17322-083012-DD-046	0.0056 J	0.010 U	mg/kg
				GW-17322-083012-DD-047	0.0073 J	0.010 U	mg/kg
				GW-17322-083012-DD-048	0.0057 J	0.010 U	mg/kg
				GW-17322-083012-DD-049	0.0021 J	0.010 U	mg/kg
				GW-17322-083012-DD-051	0.0030 J	0.010 U	mg/kg
TAL Metals	Selenium	9/11/2012	0.000712 J	GW-17322-082912-DD-043	0.00096 J	0.0050 U	mg/kg
				GW-17322-082912-DD-044	0.0010 J	0.0050 U	mg/kg
				GW-17322-083012-DD-048	0.0026 J	0.0050 U	mg/kg
				GW-17322-083012-DD-049	0.0028 J	0.0050 U	mg/kg
				GW-17322-083012-DD-051	0.0019 J	0.0050 U	mg/kg

Notes:

U - Qualified as Not Detected at the report limit

J - Estimated Concentration

TAL - Target Analyte List

TABLE 7

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO VIOLATION OF SURROGATE RECOVERY ACCEPTANCE CRITERIA
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Surrogate</i>	<i>Surrogate % Rec</i>	<i>Control Limits % Rec</i>	<i>Sample ID</i>	<i>Qualified Result</i>	<i>Units</i>
TCL SVOC	4-Nitroaniline	p-Terphenyl-d14	0	25 - 137	SO-17322-082012-DR-011	740 R	µg/kg
	4-Nitrophenol					740 R	µg/kg
	Benzaldehyde					370 R	µg/kg
	4-Bromophenyl phenyl ether					180 R	µg/kg
	Caprolactam					370 R	µg/kg
	2,4-Dimethylphenol					370 R	µg/kg
	4-Methylphenol					180 R	µg/kg
	4-Chloroaniline					740 R	µg/kg
	2,2'-Oxybis(1-chloropropane)					180 R	µg/kg
	Phenol					180 R	µg/kg
	bis(2-Chloroethyl)ether					180 R	µg/kg
	bis(2-Chloroethoxy)methane					180 R	µg/kg
	Hexachlorobenzene					180 R	µg/kg
	Anthracene					34 J	µg/kg
	2,4-Dichlorophenol					180 R	µg/kg
	2,4-Dinitrotoluene					180 R	µg/kg
	Dimethyl phthalate					370 R	µg/kg
	Dibenzofuran					180 R	µg/kg
	Atrazine					370 R	µg/kg
	Fluoranthene					60 J	µg/kg
	Acenaphthylene					34 R	µg/kg
	2,4-Dinitrophenol					740 R	µg/kg
	4,6-Dinitro-2-methylphenol					370 R	µg/kg
	4-Chloro-3-methylphenol					180 R	µg/kg
	2,6-Dinitrotoluene					180 R	µg/kg
	N-Nitrosodi-n-propylamine					180 R	µg/kg
	Hexachloroethane					180 R	µg/kg
	4-Chlorophenyl phenyl ether					180 R	µg/kg
	Hexachlorocyclopentadiene					370 R	µg/kg
	Isophorone					180 R	µg/kg
	Acenaphthene					34 R	µg/kg
	Diethyl phthalate					370 R	µg/kg
	Di-n-butylphthalate					370 R	µg/kg
	Phenanthrene					560 J	µg/kg

TABLE 7

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO VIOLATION OF SURROGATE RECOVERY ACCEPTANCE CRITERIA
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Surrogate</i>	<i>Surrogate % Rec</i>	<i>Control Limits % Rec</i>	<i>Sample ID</i>	<i>Qualified Result</i>	<i>Units</i>
TCL SVOC (continued)	N-Nitrosodiphenylamine	p-Terphenyl-d14	0	25 - 137	SO-17322-082012-DR-011	180 R	µg/kg
	Fluorene					34 R	µg/kg
	Carbazole					180 R	µg/kg
	Hexachlorobutadiene					180 R	µg/kg
	Pentachlorophenol					370 R	µg/kg
	2,4,6-Trichlorophenol					180 R	µg/kg
	2-Nitroaniline					740 R	µg/kg
	2-Nitrophenol					180 R	µg/kg
	2-Chloronaphthalene					90 R	µg/kg
	Biphenyl (1,1-Biphenyl)					370 R	µg/kg
	2-Methylphenol					180 R	µg/kg
	2-Chlorophenol					180 R	µg/kg
	2,4,5-Trichlorophenol					180 R	µg/kg
	Acetophenone					370 R	µg/kg
	Nitrobenzene					180 R	µg/kg
	3-Nitroaniline					740 R	µg/kg

Notes:

J - Estimated Concentration

R - Rejected

%Rec - Percent Recovery

TCL - Target Compound List

SVOC - Semivolatile Organic Compounds

TABLE 8

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO TRIP BLANK CONTAMINATION
 PHASE III ENVIRONMENTAL ASSESSMENT
 PCC VALIDATION
 PONTIAC, MICHIGAN

<i>Parameter</i>	<i>Analyte</i>	<i>Trip Blank ID</i>	<i>Blank Date</i>	<i>Blank Result</i>	<i>Associated Sample ID</i>	<i>Original Result</i>	<i>Qualified Result</i>	<i>Units</i>
TCL VOC	2-Butanone	TB-101207-003	10/02/08	140 J	SO-17322-082312-DR-036	190 J	230 U	µg/kg
					SO-17322-082312-DR-037	180 J	220 U	µg/kg
					SO-17322-082312-DR-038	150 J	220 U	µg/kg
					SO-17322-082312-DR-039	180 J	240 U	µg/kg
					SO-17322-082312-DR-040	150 J	220 U	µg/kg

Notes:

U - Qualified as Not Detected at the report limit

J - Estimated Concentration

TCL - Target Compound List

VOC - Volatile Organic Compounds

APPENDIX D

DRAFT BACKGROUND SOIL INVESTIGATION MEMORANDUM



DRAFT MEMORANDUM
PRIVILEGED AND CONFIDENTIAL
PREPARED AT THE REQUEST OF COUNSEL

TO: Mr. Robert Hare, MLC

FROM: Mr. Terry Gayman, CRA/cb/9

RE: **Background Soil Investigation**
Pontiac Validation Center
Pontiac, Michigan

REF. NO.: 017322

DATE: December 8, 2009

1.0 INTRODUCTION

Conestoga-Rovers & Associates, Inc. (CRA) has prepared this Memorandum to present the results of a background soil investigation at the Pontiac Validation Center (Site) located in Pontiac, Michigan. The background soil investigation was conducted concurrently with the Phase II Environmental Site Assessment (ESA) activities at the Site. The Phase II ESA activities were performed between October 2007 and April 2008, the results of which are summarized in a Phase II ESA Report (CRA, 2009). The purpose of the background soil investigation was to assist in evaluating due care obligations at the Site in accordance with Michigan Act 451 Part 201 Section 20107(a).

2.0 BACKGROUND

CRA was retained by Environmental Corporate Remediation Company Inc. (ENCORE), at the request of General Motors Corporation (GM) Legal Staff, to complete a Phase II ESA for the Site. The Phase II ESA was performed to further investigate potential areas of concern (PAOCs) identified during the Phase I ESA completed by CRA in 2006. The Phase II ESA included soil and groundwater investigative activities.

3.0 BACKGROUND METALS CONCENTRATIONS IN SOIL

During the Phase II ESA, CRA completed a preliminary review of background metals concentrations in Site soils. This background soil investigation was initiated after the preliminary review of soil data revealed various metals concentrations exceeding Part 201 Criteria. The background soil investigation was completed in accordance with the requirements presented in the Michigan Department of Environmental Quality (MDEQ) document *Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria* (MDEQ, 2002, referred to as the "S³TM"). Site-specific background metals concentrations (as defined in Section 4.3 of "Statistical Methods" (Tab 7) of the S³TM) were determined for naturally-occurring metals in soils (as described in the following sections), and are used as a basis of comparison in cases where on-Site soil samples contain metals at concentrations exceeding applicable Part 201 Criteria. It is known that the

Erie Lobe during the last glaciation period had higher values of naturally occurring metals than the State-wide Default Background Values.

3.1 Statistical Methodologies and Calculated Background Values

Guidance for generating and applying soil background data for assessing compliance with Part 201 requirements is detailed in "Statistical Guidesheet 10" and Chapter 4 of Tab 7 of the S³TM. If background concentrations are greater than Part 201 Criteria for naturally occurring substances, then background comparisons may be performed on a point-by-point basis using a background mean plus three standard deviations value. A number of assumptions for the background data set must be statistically assessed before the comparisons are performed. The following subsections present the required details for the statistical calculations. Background values are established separately for each soil horizon being evaluated at a Act 451 Part 201 Facility (i.e. clay, sand, etc.).

3.1.1 Background Data

The geologic framework for the Site was defined from a review of stratigraphic and instrumentation logs from the Phase II ESA investigative activities. The Site geologic setting is primarily dominated by a sand and gravel fill layer, underlain by native clay/silt glacial deposits, underlain by bedrock. Isolated and discontinuous sand layers are interspersed throughout the native clay/silt glacial deposit at varying depths and thicknesses.

Background data for metals were collected at ten locations (BG-01 to BG-10) in March 2008. At each of the ten locations, two samples were collected: one shallow sample (typically 2-8 feet below ground surface (bgs)) in a sand layer as encountered; and a second, deep, sample (typically 10-19 feet bgs) in the native clay/silt deposit. A sandy layer was not encountered during boring at BG-05, and consequently, only a clay soil sample was collected. The background sample locations are presented on Figure A.1. Stratigraphy logs are presented in Attachment A.

The background soil samples were shipped to Test America Laboratories, Inc. (Test America) under standard chain of custody (COC) procedures and were submitted for laboratory analysis of 23 metals. A summary of the stratigraphy at the sampled locations is provided in Table 1, and the resulting background data sets are provided in Table 2. The S³TM recommends a minimum of nine background samples for establishing a Facility-specific background concentration, which have been successfully obtained for both sandy (9 background samples) and clayey (10 background samples) horizons being evaluated at the Site.

3.1.2 Non-Detects in the Background Data Set

The derivation of Site-specific background concentrations (see Table 3) when non-detect data are present is presented in Chapter 5 of Tab 7 of the S³TM. Specifically, if more than 50 percent of the background data for a given inorganic parameter is non-detect, non-parametric upper tolerance limits should be used. This occurred for five cases in the background data (see Tables 2 and 3): hexavalent chromium in both sandy and clay background samples; silver and thallium in sands; and mercury in clays. In these cases, the maximum concentration (or target detection limit) was taken as the non-parametric upper tolerance limit.

For data sets with up to 50 percent non-detect data, a value of one-half the detection limit is to be substituted for each non-detect data point prior to statistical evaluations (i.e., distribution testing, outlier testing, and background value computation).

3.1.3 Assessment of Data Characteristics and Assumptions

For background data sets containing up to 50 percent non-detect data, prior to calculating a Site-specific background concentration each set must be evaluated for underlying statistical distribution (i.e., normal, lognormal, or neither) and the presence of statistical outliers (atypically large or small values), per Section 4.3.1.1 of Tab 7 of the S³TM.

The background data distribution was assessed using the Shapiro-Wilk W-test, and probability plots where needed (Sections 1.3.5 and 1.3.3, respectively, of Tab 7 of the S³TM), considering both the original and log-transformed concentration data. Concurrently, the presence of statistical outliers was assessed using Dixon's test (for up to 25 data points, Section 2.1.4 of Tab 7 of the S³TM) for the original and log-transformed data sets. Since the assessment of these two data characteristics (distribution and outliers), is interrelated, a final decision on the appropriate data distribution to use was made considering the results of both tests. In cases where a data distribution could not be identified, the non-parametric upper tolerance limit procedure (see Section 3.1.2 above) is appropriate for determining a background value.

Results of the data distribution and outlier testing are given in Table 3.

3.1.4 Calculation of Site-Specific Background Concentrations

As noted above, if greater than 50 percent of the background data are non-detect results, or a given background data set was neither normally nor lognormally distributed, then a non-parametric upper tolerance limit was used for the background value. For instances with fewer than 86 background data points (which is the case for the background sampling), the nonparametric upper tolerance limit of the 95th percentile of background data is the maximum concentration observed.

For normal and lognormal data sets containing up to 50 percent non-detects, the Site-specific background concentration is calculated as the mean plus three standard deviations (Section 4.3.1.1 of Tab 7 of the S³TM).

The treatment of statistical outliers identified is outlined in Section 2.2 of Tab 7 of the S³TM. As noted under "*Facility-specific background samples collected off of the property of interest*" in this section, the background data obtained for the Site are believed to represent naturally occurring background metals concentrations, and were therefore retained. In some cases this resulted in the background data set being neither normally nor lognormally distributed, requiring the use of an upper tolerance limit. In other cases, a discernable data distribution was appropriate (normal or lognormal), and the mean plus three standard deviation method was used to calculate background values.

Details of the background value calculations, and the values obtained, are presented in Table 3 for sandy and clayey soil at the Site.

3.2 Applicability of Background Values for Comparing On-Site Conditions

The Site-specific background concentrations have been established for the 23 inorganic chemicals analyzed in the background samples. These background values are appropriate for a point-by-point comparisons of on-Site data. The background values are not appropriate for group-based comparisons (such as comparing an area of the Site against background conditions), in which case the procedures found in Section 4.3.2 of Tab 7 of the S³TM should be applied.

4.0 REFERENCES

CRA, 2006. Phase I Environmental Site Assessment, General Motors Pontiac Centerpoint Campus - Validation Center, Pontiac, Michigan.

CRA, 2009. Phase II Environmental Site Assessment, General Motors Validation Center, Pontiac, Michigan.

MDEQ, 2002. Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria. Michigan Department of Environmental Quality, Environmental Response Division.

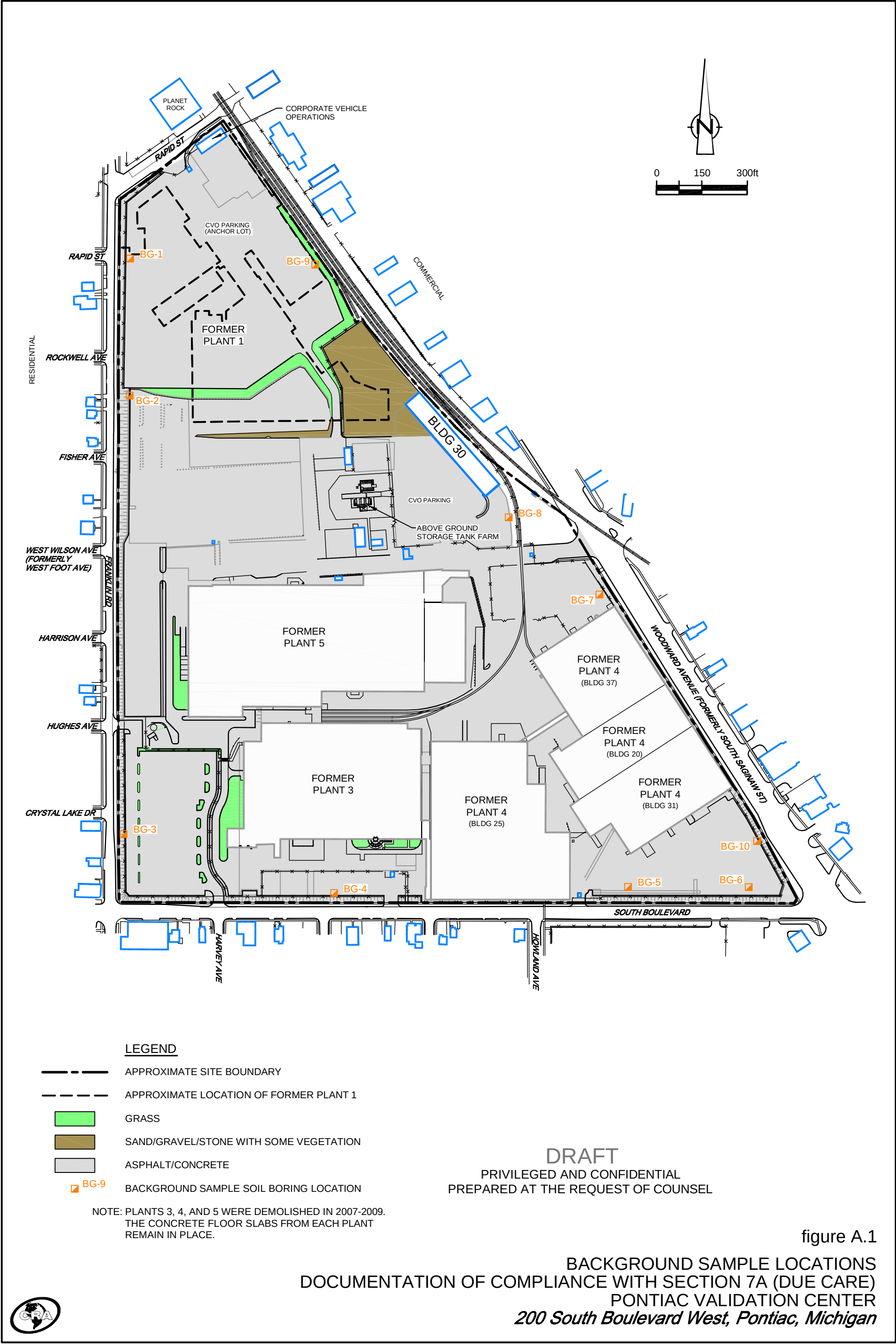


TABLE 1
BACKGROUND SAMPLE KEY AND STRATIGRAPHY
PONTIAC VALIDATION CENTER
PONTIAC, MICHIGAN

<i>Borehole Name</i>	<i>Samples Collected in Sand Layer</i>		<i>Samples Collected in Clay/Silt Layer</i>	
	<i>Depth (ft bgs)</i>	<i>Soil Description</i>	<i>Depth (ft bgs)</i>	<i>Soil Description</i>
BG-1	4-6	Sand, trace gravel	17-19	Clays, trace gravels
BG-2	11-13	Sands, trace fine gravels	16-18	Sand clays, silts
BG-3	7-8	Sands, medium to fine grained	12-14	Clays, trace gravels
BG-4	3-5	Sandy silts	12-14	Clays
BG-5	--	< no sandy soil encountered >	11-13	Clays, trace gravels
BG-6	7-9	Sands with clays	13-15	Clays, trace gravels
BG-7	3-5	Sands, trace gravels	12-14	Clays, trace gravels
BG-8	1.5-2	Sands, clays, silts	6-8	Clays, trace gravels
BG-9	2-3	Sands, trace gravels	4-6	Clays, trace gravels
BG-10	2-4	Sands, some clays	8-10	Clays, trace fine gravels

Samples in Sandy Soils

Sample Location:		BG-01	BG-02	BG-03	BG-04	BG-05	BG-06	BG-07	BG-08	BG-09	BG-10
Depth (ft bgs)		(4-6)	(11-13)	(7-8)	(3-5)	--	(7-9)	(3-5)	(1.5-2)	(2-3)	(2-4)
Sample ID:		SO-17322-030708-MC-012	SO-17322-030708-MC-001	SO-17322-030608-MC-003	SO-17322-030608-MC-001	--	SO-17322-030708-MC-004	SO-17322-030708-MC-006	SO-17322-030708-MC-008	SO-17322-030708-MC-010	SO-17322-030708-MC-014
Sample Date:		03/07/2008	03/07/2008	03/06/2008	03/06/2008	--	03/07/2008	03/07/2008	03/07/2008	03/07/2008	03/07/2008
Sample Type:											
Parameter:	Units										
Metals											
Aluminum	mg/kg	2430	1640	4590	5240	--	7220	2120	4950	2740	7550
Antimony	mg/kg	0.069 J	0.080 J	R	0.053 J	--	0.054 J	0.056 J	0.057 J	0.053 J	0.056 J
Arsenic	mg/kg	4.1 J	3.7	2.6 J	4.7	--	5.8 J	3.6 J	2.8 J	3.3 J	4.8 J
Barium	mg/kg	12.6	7.6	23.7	38.3	--	214	4.7	44.3	12.2	35.9
Beryllium	mg/kg	0.14 J	0.18 U	0.24	0.28	--	0.43	0.17 U	0.26	0.17 J	0.36
Cadmium	mg/kg	0.12	0.26	0.064 J	0.23	--	0.45	0.082 J	0.15	0.098	0.22
Calcium	mg/kg	91300	37600	1010	65900	--	2060	40400	1400	24700	11400
Chromium III (Trivalent)	mg/kg	5.7	4.6	8.1	9.2	--	12.6	7.4	8.4	5.9	14.2
Chromium Total	mg/kg	5.7	4.6	8.4	9.7	--	12.9	7.6	8.7	5.9	14.7
Chromium VI (Hexavalent)	mg/kg	0.83 U	0.89 U	0.95 U	0.88 U	--	0.93 U	0.87 U	0.94 U	0.93 U	0.91 U
Cobalt	mg/kg	3.3	2.4	2.7	5.3	--	9.3	2.8	5.4	4.0	6.9
Copper	mg/kg	8.9	8.0	6.6	15.4	--	6.1	6.2	6.5	14.1	13.0
Iron	mg/kg	6240	5150	8370	11800	--	20500	5580	8700	8270	13500
Lead	mg/kg	4.5	3.6	4.0	6.1	--	5.7	3.5	18.2	6.0	6.6
Magnesium	mg/kg	15200	7290	1160	10700	--	1530	9700	1260	4710	4310
Manganese (Dissolved)	mg/kg	285	124	55.7	373	--	4110	184	517	374	413
Mercury	mg/kg	0.041 U	0.045 U	0.018 J	0.044 U	--	0.048	0.044 U	0.032 J	0.019 J	0.028 J
Nickel	mg/kg	8.8 J	8.2 J	8.4 J	13.9 J	--	14.1 J	7.5 J	8.0 J	9.8 J	15.8 J
Potassium	mg/kg	364 J	371 J	370 J	1010	--	590	281 J	592	501	841
Selenium	mg/kg	0.21 J	0.21	0.38 J	0.39	--	0.76 J	0.17 J	0.41 J	0.41 J	0.49 J
Silver	mg/kg	0.083 UJ	0.089 U	0.095 UJ	0.088 U	--	0.021 J	0.087 UJ	0.028 J	0.093 UJ	0.019 J
Sodium	mg/kg	224	89.0 U	442	826	--	248	87.2 U	515	186	178
Thallium	mg/kg	0.11 U	0.13	0.095 U	0.17	--	0.19	0.087 U	0.094 U	0.14	0.11 U
Vanadium	mg/kg	8.1	8.5	12.4	13.7	--	24.2	8.7	12.9	8.9	21.4
Zinc	mg/kg	22.1 J	33.2 J	19.2 J	33.8 J	--	47.5 J	18.7 J	28.6 J	30.1 J	31.8 J

- Notes:
- U Not present at or above the associated value.
 - J Estimated concentration.
 - UJ Estimated reporting limit.
 - R Rejected based on outlying matrix spike/matrix spike duplicate recoveries .
 - Sandy soils not encountered, no sample obtained.
 - ft bgs Feet below ground surface.

Samples in Clayey Soils

Sample Location: Depth (ft bgs)		BG-01 (17-19)	BG-02 (16-18)	BG-03 (12-14)	BG-04 (12-14)	BG-05 (11-13)	BG-06 (13-15)	BG-07 (12-14)	BG-08 (6-8)	BG-09 (4-6)	BG-10 (8-10)
Sample ID:		SO-17322-030708-MC-013	SO-17322-030708-MC-002	SO-17322-030608-MC-004	SO-17322-030608-MC-002	SO-17322-030708-MC-003	SO-17322-030708-MC-005	SO-17322-030708-MC-007	SO-17322-030708-MC-009	SO-17322-030708-MC-011	SO-17322-030708-MC-015
Sample Date:		03/07/2008	03/07/2008	03/06/2008	03/06/2008	03/07/2008	03/07/2008	03/07/2008	03/07/2008	03/07/2008	03/07/2008
Sample Type:											
Parameter:	Units										
Metals											
Aluminum	mg/kg	4580	3050	7650	6550	7820	6380	7830	8930	5060	7510
Antimony	mg/kg	0.063 J	0.16 J	0.066 J	0.066 J	0.074 J	0.030 J	0.067 J	0.064 J	0.060 J	0.067 J
Arsenic	mg/kg	3.5 J	6.6	4.6 J	6.7	2.7 J	1.2 J	3.5 J	4.5 J	5.6 J	5.2 J
Barium	mg/kg	22.7	12.9	54.9	41.9	42.0	27.6	42.3	56.1	26.1	44.5
Beryllium	mg/kg	0.22	0.20 J	0.42	0.36	0.41	0.30	0.38	0.44	0.27	0.40
Cadmium	mg/kg	0.17	0.62	0.25	0.31	0.14	0.12	0.21	0.23	0.20	0.23
Calcium	mg/kg	57000	68700	95100	74800	77700	54500	66300	79000	55500	100000
Chromium III (Trivalent)	mg/kg	9.3	6.4	14.3	11.9	13.4	11.6	13.7	14.7	11.3	13.5
Chromium Total	mg/kg	9.3	6.4	14.3	12.3	14.0	11.9	13.7	15.3	11.3	13.5
Chromium VI (Hexavalent)	mg/kg	0.88 U	1.0 U	0.91 U	0.91 U	0.94 U	0.89 U	0.91 U	0.91 U	0.89 U	0.90 U
Cobalt	mg/kg	5.2	5.0	13.3	6.3	7.9	4.6	5.0	8.9	5.0	6.5
Copper	mg/kg	9.5	15.7	18.0	15.9	14.2	9.0	14.5	17.3	11.5	17.8
Iron	mg/kg	9920	10600	16200	16600	13300	9620	14000	17200	11500	15300
Lead	mg/kg	4.3	6.1	8.5	7.2	7.0	6.0	6.1	7.7	27.6	7.3
Magnesium	mg/kg	18500	24900	14500	11400	14400	19900	12500	14500	17600	14900
Manganese (Dissolved)	mg/kg	231	334	583	336	350	227	288	467	294	396
Mercury	mg/kg	0.044 U	0.052 U	0.020 J	0.046 U	0.047 U	0.045 U	0.046 U	0.018 J	0.045 U	0.021 J
Nickel	mg/kg	13.2 J	15.3 J	24.9 J	18.1 J	20.9 J	13.7 J	17.5 J	25.1 J	13.8 J	18.4 J
Potassium	mg/kg	1000	726	1870	1190	1830	1280	1800	1840	1020	1480
Selenium	mg/kg	0.32 J	0.71	0.53 J	0.48	0.55 J	0.47 J	0.44 J	0.47 J	0.36 J	0.50 J
Silver	mg/kg	0.023 J	0.038 J	0.026 J	0.091 U	0.031 J	0.026 J	0.091 UJ	0.091 UJ	0.089 UJ	0.019 J
Sodium	mg/kg	127	196	497	811	588	206	1210	861	195	90.2 U
Thallium	mg/kg	0.17	0.39	0.23	0.15	0.22	0.19	0.17	0.26	0.14	0.22
Vanadium	mg/kg	16.7	11.4	19.0	16.1	17.7	14.4	17.8	19.7	15.8	17.7
Zinc	mg/kg	25.0 J	42.9 J	36.5 J	57.9 J	33.3 J	31.6 J	35.9 J	39.1 J	27.3 J	36.1 J

Notes:

- U
- Not present at or above the associated value.
- J
- Estimated concentration.
- UJ
- Estimated reporting limit.
-
- Sandy soils not encountered, no sample obtained.

TABLE 3
SITE-SPECIFIC BACKGROUND VALUE CALCULATIONS PER MICHIGAN PART 201 GUIDANCE
PONTIAC VALIDATION CENTER
PONTIAC, MICHIGAN

Parameter:	Units	Summary Statistics				Data distribution test results (Shapiro-Wilk)					Outlier test results (Dixon's test)				Calculated Background Values				Selected Background Value
		Number of samples	Percentage non-detects	Minimum value	Maximum value	Original data		Log-transformed data		Overall Conclusion	Original data		Log-transformed data		Mean (X)	S.D. (S)	Background (X+3S)	Non-parametric (maximum)	
						W-statistic	Conclusion	W-statistic	Conclusion		# Outliers	Values	# Outliers	Values					
(i) Sandy (shallower) soils																			
Metals																			
Aluminum	mg/kg	9	0%	1640	7550	0.910	Normal	0.926	Normal	Lognormal	0	--	0	--	4276	2186	10834	--	10800
Antimony	mg/kg	8	0%	0.053 J	0.080 J	0.733	Not Normal	0.757	Not Normal	Unknown	2	0.069J; 0.080J	2	0.069J; 0.080J	0.0598	0.010	0.089	0.080 J	0.080 J
Arsenic	mg/kg	9	0%	2.6 J	5.8 J	0.963	Normal	0.976	Normal	Lognormal	0	--	0	--	3.93	1.03	7.02	--	7.02
Barium	mg/kg	9	0%	4.7	214	0.592	Not Normal	0.954	Normal	Lognormal	1	214	0	--	43.7	65.5	240	--	240
Beryllium	mg/kg	9	22%	0.17 U	0.43	0.948	Normal	0.937	Normal	Normal	0	--	0	--	0.228	0.119	0.584	--	0.584
Cadmium	mg/kg	9	0%	0.064 J	0.45	0.876	Normal	0.972	Normal	Lognormal	1	0.45	0	--	0.186	0.121	0.549	--	0.549
Calcium	mg/kg	9	0%	1010	91300	0.883	Normal	0.877	Normal	Normal	0	--	0	--	30641	31666	125639	--	126000
Chromium III (Trivalent)	mg/kg	9	0%	4.6	14.2	0.922	Normal	0.967	Normal	Lognormal	0	--	0	--	8.46	3.18	18.0	--	18
Chromium Total	mg/kg	9	0%	4.6	14.7	0.932	Normal	0.970	Normal	Lognormal	0	--	0	--	8.69	3.35	18.7	--	18.7
Chromium VI (Hexavalent)	mg/kg	9	100%	0.83 U	0.95 U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.95 U	0.95 U
Cobalt	mg/kg	9	0%	2.4	9.3	0.890	Normal	0.943	Normal	Lognormal	0	--	0	--	4.68	2.30	11.6	--	11.6
Copper	mg/kg	9	0%	6.1	15.4	0.823	Not Normal	0.846	Normal	Lognormal	0	--	0	--	9.42	3.72	20.6	--	20.6
Iron	mg/kg	9	0%	5150	20500	0.856	Normal	0.945	Normal	Lognormal	0	--	0	--	9790	4872	24406	--	24400
Lead	mg/kg	9	0%	3.5	18.2	0.626	Not Normal	0.814	Not Normal	Unknown	1	18.2	1	18.2	6.47	4.55	20.1	18.2	18.2
Magnesium	mg/kg	9	0%	1160	15200	0.911	Normal	0.898	Normal	Normal	0	--	0	--	6207	4900	20907	--	20900
Manganese (Dissolved)	mg/kg	9	0%	55.7	4110	0.502	Not Normal	0.909	Normal	Lognormal	1	4110	1	4110	715	1282	4560	--	4560
Mercury	mg/kg	9	44%	0.018 J	0.048	n/a	n/a	n/a	n/a	Lognormal	3	0.048; 0.032J; 0.028J	3	0.048; 0.032J; 0.028J	0.0258	0.0094	0.054	--	0.0541
Nickel	mg/kg	9	0%	7.5 J	15.8 J	0.816	Not Normal	0.841	Normal	Lognormal	3	15.8J; 14.1J; 13.9J	3	15.8J; 14.1J; 13.9J	10.5	3.18	20.0	--	20
Potassium	mg/kg	9	0%	281 J	1010	0.889	Normal	0.942	Normal	Lognormal	2	1010; 841	0	--	547	243	1276	--	1280
Selenium	mg/kg	9	0%	0.17 J	0.76 J	0.887	Normal	0.921	Normal	Lognormal	3	0.17J; 0.21J; 0.21	3	0.17J; 0.21J; 0.21	0.381	0.180	0.922	--	0.922
Silver	mg/kg	9	67%	0.019 J	0.095 UJ	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.095 UJ	0.095 UJ
Sodium	mg/kg	9	22%	87.2 U	826	0.883	Normal	0.913	Normal	Lognormal	3	826; 515; 442	2	87.2U; 89.0U	301	253	1059	--	1060
Thallium	mg/kg	9	56%	0.087 U	0.19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.19	0.19
Vanadium	mg/kg	9	0%	8.1	24.2	0.818	Not Normal	0.870	Normal	Lognormal	2	24.2; 21.4	0	--	13.2	5.87	30.8	--	30.8
Zinc	mg/kg	9	0%	18.7 J	47.5 J	0.914	Normal	0.932	Normal	Lognormal	0	--	0	--	29.4	8.94	56.3	--	56.3
(ii) Clay (deeper) soils																			
Metals																			
Aluminum	mg/kg	10	0%	3050	8930	0.929	Normal	0.869	Normal	Normal	0	--	0	--	6536	1808	11961	--	12000
Antimony	mg/kg	10	0%	0.030 J	0.16 J	0.652	Not Normal	0.768	Not Normal	Unknown	3	0.030J; 0.074J; 0.16J	3	0.030J; 0.074J; 0.16J	0.0717	0.033	0.171	0.16 J	0.16 J
Arsenic	mg/kg	10	0%	1.2 J	6.7	0.964	Normal	0.863	Normal	Normal	0	--	0	--	4.41	1.73	9.61	--	9.61
Barium	mg/kg	10	0%	12.9	56.1	0.934	Normal	0.888	Normal	Normal	0	--	0	--	37.1	14.2	79.7	--	79.7
Beryllium	mg/kg	10	0%	0.20 J	0.44	0.902	Normal	0.875	Normal	Normal	0	--	0	--	0.340	0.087	0.600	--	0.6
Cadmium	mg/kg	10	0%	0.12	0.62	0.735	Not Normal	0.920	Normal	Lognormal	1	0.62	0	--	0.248	0.142	0.673	--	0.673
Calcium	mg/kg	10	0%	54500	100000	0.921	Normal	0.934	Normal	Lognormal	0	--	0	--	72860	15799	120256	--	120000
Chromium III (Trivalent)	mg/kg	10	0%	6.4	14.7	0.883	Normal	0.813	Not Normal	Normal	0	--	0	--	12.0	2.56	19.7	--	19.7
Chromium Total	mg/kg	10	0%	6.4	15.3	0.900	Normal	0.825	Not Normal	Normal	0	--	0	--	12.2	2.67	20.2	--	20.2
Chromium VI (Hexavalent)	mg/kg	10	100%	0.88 U	1.0 U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.0 U	1.0 U
Cobalt	mg/kg	10	0%	4.6	13.3	0.777	Not Normal	0.857	Normal	Lognormal	1	13.3	0	--	6.77	2.69	14.9	--	14.9
Copper	mg/kg	10	0%	9	18	0.896	Normal	0.866	Normal	Normal	0	--	0	--	14.3	3.31	24.3	--	24.3
Iron	mg/kg	10	0%	9620	17200	0.913	Normal	0.907	Normal	Normal	0	--	0	--	13424	2874	22046	--	22000
Lead	mg/kg	10	0%	4.3	27.6	0.532	Not Normal	0.727	Not Normal	Unknown	1	27.6	2	27.6; 4.3	8.78	6.71	28.9	27.6	27.6
Magnesium	mg/kg	10	0%	11400	24900	0.912	Normal	0.954	Normal	Lognormal	0	--	0	--	16310	3999	28308	--	28300
Manganese (Dissolved)	mg/kg	10	0%	227	583	0.912	Normal	0.959	Normal	Lognormal	0	--	0	--	351	109	677	--	677
Mercury	mg/kg	10	70%	0.018 J	0.052 U	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.052 U	0.052 U
Nickel	mg/kg	10	0%	13.2 J	25.1 J	0.893	Normal	0.915	Normal	Lognormal	0	--	0	--	18.1	4.39	31.3	--	31.3
Potassium	mg/kg	10	0%	726	1870	0.893	Normal	0.894	Normal	Lognormal	0	--	0	--	1404	419	2662	--	2660
Selenium	mg/kg	10	0%	0.32 J	0.71	0.937	Normal	0.953	Normal	Lognormal	0	--	0	--	0.483	0.107	0.803	--	0.803
Silver	mg/kg	10	40%	0.019 J	0.091 U	0.857	Normal	0.870	Normal	Lognormal	0	--	0	--	0.0344	0.011	0.066	--	0.0661
Sodium	mg/kg	10	10%	90.2 U	1210	0.899	Normal	0.938	Normal	Lognormal	0	--	0	--	474	387	1635	--	1640
Thallium	mg/kg	10	0%	0.14	0.39	0.842	Not Normal	0.934	Normal	Lognormal	1	0.39	0	--	0.214	0.073	0.432	--	0.432
Vanadium	mg/kg	10	0%	11.4	19.7	0.927	Normal	0.880	Normal	Normal	0	--	0	--	16.6	2.40	23.8	--	23.8
Zinc	mg/kg	10	0%	25.0 J	57.9 J	0.894	Normal	0.955	Normal	Lognormal	1	57.9J	0	--	36.6	9.17	64.1	--	64.1

Notes:

- U Not present at or above the associated value
J Estimated concentration
UJ Estimated reporting limit
R Rejected
-- Sandy soils not encountered, no sample obtained.



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-1
DATE COMPLETED: March 7, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	FILL, concrete, sands, gravels	0.58						0.0
4	SP-SANDS, trace gravels, medium to fine grained, some clay mix, brown, moist			1GP		70		0.0
6				4-6'-012				0.0
8	ASPHALT	7.00						0.0
10	SP-SANDS, fine grained, trace gravels, black, moist	7.50		2GP		60		0.0
12	CI-CLAYS, trace fine sands, trace silts, moderate plasticity, soft, dark gray, moist	9.00						0.0
14				3GP		50		0.0
16	GP-GRAVELS, medium sized, angular, orange, moist	13.00						0.0
18	CI-CLAYS, trace gravels, trace fine sands, trace silts, soft, moderate plasticity, gray, moist	14.00						0.0
20	CH-CLAYS, trace gravels, trace silts, moderate plasticity, moderately stiff, gray, moist	17.00		4GP		50		0.0
22	SP-SANDS, medium to fine grained, trace gravels, gray, wet	19.00		17-19'-013				0.0
24	END OF BOREHOLE @ 20.0ft BGS	20.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-2
DATE COMPLETED: March 7, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	FILL, sands, gravels, mixed clays, asphalt							0.0
2	CI-CLAYS, trace fine gravels, moderate plasticity, moderately stiff, brown, moist	1.33		1GP		70		0.0
4	SM-SILTY SANDS, trace clays, trace gravels, some sand lenses < 2" thick, brown, moist	3.00						0.0
6								0.0
8		8.00		2GP		70		0.0
10	SP-SANDS, medium to fine grained, trace silts, trace fine gravels, brown, moist to very moist	9.00						0.0
12	SM-SILTY SANDS, some clays, trace gravels, soft, brown, moist	11.00						0.0
14	SP-SANDS, trace fine gravels, medium grained, brown, moist			11-13'-001 3GP		70		0.0
16	SC-SAND CLAYS, with silts, fine sands, low plasticity, soft, gray, very moist	16.00						0.0
18				4GP 16-18'-002		85		0.0
20	SP-SANDS, trace fine gravels, fine grained, gray, wet	19.42						0.0
22	END OF BOREHOLE @ 20.0ft BGS	20.00						
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-3
DATE COMPLETED: March 6, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	FILL, sands, gravels, trace clays mixed, black, moist	1.00		1GP		80		0.0
4	CL-CLAYS, silty, trace sands, trace gravels, brown and gray mottled in areas, soft to medium soft, moderate plasticity, moist, some sand lenses with gravels <2" thick							0.0
6								0.0
8	SP-SANDS, medium to fine grained, trace fine gravels, brown, very moist to wet	7.00	▽	2GP 7'-8'-003		70		0.0
10	CH-CLAYS, trace gravels, stiff, moderate plasticity, brown/gray mottled, moist	8.00						0.0
12	CH-CLAYS, trace gravels, very stiff, moderate plasticity, brown, moist	10.00						0.0
14				3GP 12'-14'-004		100		0.0
16	END OF BOREHOLE @ 15.0ft BGS	15.00						
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▽
CHEMICAL ANALYSIS ○

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-4
DATE COMPLETED: March 6, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	FILL, asphalt, sands, gravels, brown, moist	0.66						0.0
2	SC-SANDS, with clays, (FILL), brown/black, moist			1GP				
4	SM-SANDY SILTS, trace clays, trace fine gravels, fine grained sands, brown, moist	3.00		3-5' -001				0.0
6								
8	CL-SILTY CLAYS, trace sands, trace fine gravels, fine grained, soft, moderate plasticity, dark brown to brown, moist	6.42		2GP				0.0
10								0.0
12	CH-CLAYS, stiff, moderate plasticity, brown/gray mottled, moist	11.42		3GP 12-14' -002				0.0
14								
16	END OF BOREHOLE @ 15.0ft BGS	15.00						
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-5

DATE COMPLETED: March 7, 2008

DRILLING METHOD: GEOPROBE

FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	FILL-gravels, concrete, sands, black, moist							0.0
4	CL-CLAYS, trace gravels, some fine sands, some silts, soft to moderately soft, debris (glass, brick), gray/black (FILL),	2.16		1GP		40		0.0
6								0.0
8				2GP		70		0.0
10								0.0
12	CH-CLAYS, trace gravels, moderate plasticity, stiff, gray, moist	10.00		11-13 -003 3GP		70		0.0
14								0.0
16	END OF BOREHOLE @ 15.0ft BGS	15.00						
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-6

DATE COMPLETED: March 7, 2008

DRILLING METHOD: GEOPROBE

FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (ppm)
	FILL, gravels, concrete, sands, brick, black							0.0
2	CL-CLAYS, sandy, trace silts, trace gravels, moderate plasticity, moderately stiff, brown, moist	1.42		1GP		70		0.0
4								0.0
6	SC-SANDS, with clays, medium to fine grained, trace fine gravels, brown, moist	6.00						0.0
8				2GP 7-9 -004		95		0.0
10	CI-CLAYS, trace sands, trace gravels, moderate plasticity, soft, moist	9.50						0.0
12								0.0
14	CH-CLAYS, trace gravels, moderate plasticity, stiff, moist	13.00		3GP		90		0.0
16	END OF BOREHOLE @ 15.0ft BGS	15.00		13-15 -005				
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 12/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-7
DATE COMPLETED: March 7, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	FILL, asphalt, sands, gravels, mixed clays, black	0.66		1GP		70		0.0
4	SP-SANDS, trace gravels, medium to fine grained, brown, moist			3-5' -006				0.0
6	CI-CLAYS, trace sands, trace gravels, moderate plasticity, soft, brown, very moist	6.00		2GP		90		0.0
8								0.0
10	CH-CLAYS, trace gravels, moderate plasticity, stiff, brown, moist	9.00		3GP 12-14' -007		100		0.0
12								0.0
14								0.0
16	END OF BOREHOLE @ 15.0ft BGS	15.00						
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

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PROJECT NAME: GM VALIDATION CENTER

PROJECT NUMBER: 17322

CLIENT: ENCORE

LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-8

DATE COMPLETED: March 7, 2008

DRILLING METHOD: GEOPROBE

FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	FILL, sands, gravels, asphalt, brick, mixed clays, moist	1.50						0.0
2	SM-SANDS, with clays and silts, very soft, low plasticity, brown, moist	2.00		1.5-2'-008 1GP		70		0.0
4	CH-CLAYS, trace gravels, moderate plasticity, stiff, brown, moist							0.0
6								0.0
8				6-8'-009 2GP		95		0.0
10	END OF BOREHOLE @ 10.0ft BGS	10.00						0.0
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-9
DATE COMPLETED: March 7, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
	FILL, concrete, sands, gravels, clay mix							0.0
2	SP-SANDS, medium to fine grained, trace gravels, brown, moist	2.00		1GP		80		0.0
4	CH-CLAYS, trace gravels, moderate plasticity, stiff, brown, moist	3.00		2-3' -010				0.0
6				4-6' -011				0.0
8	CI-CLAYS, trace sands, trace gravels, some silts, low plasticity, soft, gray, moist	7.00		2GP		90		0.0
10	END OF BOREHOLE @ 10.0ft BGS	10.00						0.0
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ☐

OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08



STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

Page 1 of 1

PROJECT NAME: GM VALIDATION CENTER
PROJECT NUMBER: 17322
CLIENT: ENCORE
LOCATION: PONTIAC, MICHIGAN

HOLE DESIGNATION: BG-10
DATE COMPLETED: March 7, 2008
DRILLING METHOD: GEOPROBE
FIELD PERSONNEL: M. CORAM

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	DEPTH ft BGS	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (ppm)
2	FILL, asphalt, sand SC-SANDS, some clays, trace gravels, trace silts, medium to fine grained, brown, moist	0.16		1GP 2-4' -014		90		0.0
4	CH-CLAYS, trace fine gravels, moderate plasticity, stiff, brown, moist	4.00						0.0
6	CI-CLAYS, some sands, moderate plasticity, soft, moist	5.00						0.0
8	CH-CLAYS, trace fine gravels, moderate plasticity, stiff, brown, moist	6.00		2GP		80		0.0
10	END OF BOREHOLE @ 10.0ft BGS	10.00		8-10' -015				0.0
12								
14								
16								
18								
20								
22								
24								
26								
28								
30								
32								
34								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS



OVERBURDEN LOG 17322-WIN.GPJ CRA_CORP.GDT 3/12/08

APPENDIX E

LNAPL MEMORANDUM



MEMORANDUM

TO: Tom Kinney REF. NO.: 017322
FROM: Matt Rousseau DATE: January 17, 2013
CC:
RE: **Former Plant 3 LNAPL Impacts, RACER Validation Center, Pontiac, Michigan**

The purpose of this memorandum is to provide the following discussion pertaining to the Light Non-Aqueous Phase Liquid (LNAPL) impacts present at the RACER Validation Center in Pontiac, Michigan:

1. A summary of CRA's understanding of the LNAPL Conceptual Site Model (LCSM)
2. An evaluation of potential remedial drivers in a manner consistent with Interstate Technology & Regulatory Council (ITRC) LNAPL guidance and a draft RACER LNAPL remedial decision-making process developed in conjunction with the Michigan Department of Environmental Quality
3. Propose a technically appropriate LNAPL management strategy based on Items 1 and 2 above.

The results of recent soil core petrophysical testing will be discussed as part of the LCSM discussion.

The following figures, tables and attachments will be referred to throughout the remainder of this memorandum:

Figure 1 – Site Plan

Figure 2 – Draft LNAPL/Risk Management Decision-Making Process

Table 1 – Summary of Soil Core Petrophysical Test Results

Table 2 – Summary of December 2012 Soil Analytical Results

Attachment A – Laboratory Soil Physical Property Results

Attachment B – Laboratory LNAPL Forensic Testing/Fingerprinting Results

Attachment C – Laboratory Soil Core Photography and Petrophysical Test Results

Attachment D – Quantitative Risk Assessment Results (ENVIRON)

1.0 LCSM

The LCSM is the body of information describing aspects of the LNAPL and site setting necessary to satisfy the LNAPL remedial/management objectives (ASTM, 2007; ITRC, 2009). The LCSM is similar to a Conceptual Site Model, which includes the source, pathway, and receptor, but the emphasis in the LCSM is on the source component (i.e., the LNAPL). An LCSM includes both “scientific” information regarding the LNAPL, soil and site conditions/setting, and “other” considerations and factors that are necessary to establish the true remedial drivers (risk-based or non-risk factors) for the area in question. The remedial drivers, in turn, are used to establish the overall LNAPL remedial/management objectives, and follow-up technology-specific goals, metrics and endpoints, where applicable.

The LCSM may be comprised of some or all of the following scientific and technological information:

- Release history
- Site setting (historical and current)
- Geological and hydrogeological information/setting
- LNAPL physical (density, viscosity, interfacial tensions) and chemical properties (fingerprinting, constituents, mole fractions, etc.) characteristics
- LNAPL spatial distribution (vertical and horizontal delineation)
- LNAPL mobility and body stability/migration information
- LNAPL recoverability information
- Potential Exposure Scenarios

The more pertinent elements of the LCSM are discussed in the following sections to the extent possible based on the available information.

Release History and Current Setting

The site has been used for industrial purposes since at least 1915, with GM acquiring the property in the vicinity of the LNAPL impacts around 1940. All industrial operations at the Site had ceased by the time the facility closed in 2005. Consequently, there has been no possibility of active or new releases of petroleum to the subsurface for at least seven years. The LNAPL at the Site originated from either surface spills associated with historical operations or leakage from USTs and the associated piping/connections. These types of releases would generally be low pressure/low head releases with relatively limited migration potential. The ground surface in the LNAPL-impacted area is paved. The Site is currently unused.

Geology and Hydrogeology

The LNAPL-impacted geology at the Site predominantly consists of low permeability silts/clays. Vertical hydraulic conductivity has been reported to be in the 10^{-7} - 10^{-8} cm/s range with horizontal hydraulic

conductivities on the order of 10^{-6} - 10^{-7} cm/s (see Attachment A).¹ Water table depths in the LNAPL area have varied historically from approximately 12'-16.5' below ground surface (bgs). Groundwater flow is generally to the north-northwest with an average hydraulic gradient of 0.01.

LNAPL Physical Properties

The LNAPL has been fingerprinted as a middle distillate fuel type (e.g., diesel) that has undergone significant biological degradation (see Attachment B).² This type of LNAPL is relatively non-volatile and does not typically result in significant (unacceptable) levels of dissolved or vapor phase impacts. The fact that it is significantly degraded will further reduce the rates of dissolution and volatilization of chemical constituents and the noted degradation can be expected to continue over time.

LNAPL Spatial Distribution

The lateral extent of LNAPL impacts based on laser-induced fluorescence (LIF) results is shown in Figure 1. The LNAPL area as shown in Figure 1 includes both the residual/immobile fraction and the potentially mobile/recoverable fractions (if present) since LIF detects the presence of LNAPL down to very low levels (typically less than 1% saturation or 1% of the pore space). Vertically, the most-LNAPL saturated soil is found in the 14-16 feet bgs interval with the exception of shallower impacts noted in the vicinity of L-24.

LNAPL Mobility and Body Stability

In general, the driving mechanism for LNAPL migration is the LNAPL head that exists during and shortly after a release. It is commonly believed that the hydraulic gradient "causes" LNAPL to spread. However, the reality in most cases is that the hydraulic gradient will not cause LNAPL spreading; rather, it will only influence the preferred direction of spreading where a sufficient LNAPL head exists to drive the migration. Experience has shown that the LNAPL head will dissipate relatively quickly following the cessation of a release, with most LNAPL bodies achieving overall stability (stable perimeter/footprint) within a few years. Localized areas of mobile/recoverable LNAPL may still exist within an LNAPL body at this point; however, the overall footprint of the LNAPL body will not expand further.

The older the LNAPL body, the more likely it will be stable. This is partly due to the dissipation of the LNAPL head, and partly due to the seasonal fluctuations in the water table that will "smear" the LNAPL or spread the now fixed volume of LNAPL over larger vertical extents over time. Smearing causes a progressive decrease in localized LNAPL saturations and, consequently, the mobility potential of the LNAPL. Based on the time since there was any possibility of an active release (>7 years) and the degraded

¹ The respective laboratory soil property testing results were previously published as Appendix D to CRA's *Phase II Environmental Site Assessment* report (July, 2009)

² The respective LNAPL forensic testing (fingerprinting) results were originally published as Appendix G to CRA's *Phase II Environmental Site Assessment* report (July, 2009)

nature of the LNAPL indicated by the fingerprinting, the LNAPL impacts can be assumed to have been in the ground for a very long time. As such, the LNAPL would be expected to be stable overall (i.e., not migrating).

With respect to LNAPL mobility, it could be argued that the presence of any LNAPL in a well theoretically indicates that some mobile LNAPL exists. However, where LNAPL is stable, the most typical scenario is to find LNAPL saturations mostly or entirely at residual saturation levels. The implication is that although some mobile LNAPL may exist, the fraction of the overall LNAPL that is potentially mobile will be low (i.e., most of the LNAPL will exist as immobile residual). In addition, the results of the soil core petrophysical testing provide a direct indication of the potential mobility of the LNAPL. The respective results are summarized in Table 1, with detailed laboratory results included as Attachment C.³ As indicated in Table 1, the Water Drive and Pore Fluid Saturation test results indicate that the LNAPL is present at residual/immobile saturation levels with the exception of a portion of the impacted zone at MW84-12. At MW84-12, three subsamples representing the most impacted parts of the vertical LNAPL zone were tested, with only one exhibiting a saturation in the potentially mobile range (at 15.4 feet bgs). The release of LNAPL during the Water Drive test for this subsample confirms the presence of potentially mobile LNAPL (i.e., saturation exceeds residual levels), with just under one third of the LNAPL released during testing. However, it is noted that the overall recoverable fraction at this location will be much less than what is indicated in the laboratory due to the following points:

- This subsample represents a very localized highly-impacted sand seam and, therefore, is not representative of the level of impacts across the broader vertical interval where LNAPL is observed at this location. The LNAPL saturations over most of the impacted zone are present at much lower saturation levels. Therefore, most of the LNAPL at MW84-12 is present at residual saturation levels.
- The laboratory test conditions employ extremely high pressures that are far beyond what is typically present under normal hydraulic conditions at environmental sites. Consequently, “field” residual saturation can be expected to be higher than the residual saturation indicated in the laboratory. In other words, the potentially mobile fraction indicated by the laboratory may not be seen in the field.

The limited observation of LNAPL in wells (currently not present in measurable thicknesses) provides a further line of evidence that the potential mobility of the LNAPL is limited/negligible. Contrasting the laboratory mobility results with the lack of LNAPL observed in wells illustrates that field residual saturation is higher than what is indicated in the laboratory.

LNAPL Recoverability

The recoverability of the LNAPL will largely be analogous to the potential for mobility (i.e., non-volatile LNAPL must be mobile to be recovered). Recoverability is expected to be low due to the apparently low mobility potential. The likely immobility and stability of the LNAPL also suggest that the proportion of in-

³ The soil core petrophysical laboratory test program was based upon white and ultraviolet laboratory soil core photography results, also included in Attachment C.

place LNAPL that might be recoverable is likely to be low. Where this is the case, LNAPL mass recovery efforts will likely provide negligible actual benefit since very little of the LNAPL body will be affected (i.e., most of the LNAPL body will remain as unrecoverable residual). Furthermore, the lack of measureable LNAPL in wells provides a very tangible indication of a general lack of recoverability. It is noted that the quantity of LNAPL in wells is not sufficient to conduct a meaningful estimate of LNAPL transmissivity. Nonetheless, the LNAPL at the Site is not considered to be readily recoverable given the different lines of evidence discussed above.

Potential Exposures

ENVIRON has historically evaluated risk due to the presence of the LNAPL at the Site (see Attachment D).⁴ The only potential issue associated with the LNAPL identified by ENVIRON was routine maintenance worker direct contact (dermal contact, inhalation) with chloromethane. Since the bulk of the LNAPL is present at depths of 14-16 feet bgs and the ground surface overlying the LNAPL is paved, actual direct contact with the LNAPL would only be possible in the event of a relatively deep soil excavation. Consequently, this pathway is not complete currently. Future potential exposure via this pathway is most efficiently and effectively mitigated through the use of appropriate personal protective equipment as stipulated in a health and safety plan. With this in place, there would be no current or future direct contact exposure concerns associated with the presence of the LNAPL.

More recently, soil sampling was conducted in the area at locations SB112-12 and SB113-12 in December 2012 (see Table 2). The results of this sampling event indicated only a single of generic criteria for the tested organic constituents. More specifically, the sample obtained at location SB112-12 (at 16' bgs) exceeded the generic residential and non-residential drinking water protection criteria for trichloroethene (TCE). However, the TCE exceedance does not represent a potential exposure since the drinking water pathway is not currently complete nor is it expected to be complete in the future. With respect to inorganic constituents, several metals exceeded the residential and/or non-residential drinking water protection criteria. In all cases, these apparent exceedances were consistent with the selected background levels (i.e., the generic criteria are not relevant on a Site-specific basis). Therefore, no potential exposure scenarios attributable to the presence of the LNAPL were identified with this most recent sampling event.

LCSM Summary

In summary, the following are the main points of the LCSM:

- The LNAPL is a degraded, non-volatile middle distillate fuel type
- The LNAPL body is most likely stable/non-migrating
- The fraction of the LNAPL that may be mobile and/or recoverable will be low

⁴ ENVIRON's risk assessment was previously published as Appendix F to CRA's *Phase II Environmental Site Assessment* report (July, 2009)

- With the implementation of an appropriate health and safety plan, there is no current or future risk associated with the presence of the LNAPL

LNAPL REMEDIAL DRIVERS AND OBJECTIVES

Potential remedial drivers were examined in a manner consistent with a draft RACER-MDEQ LNAPL remedial decision-making process, which is primarily based on guidance from ASTM (2007) and ITRC (2009). The identification of remedial drivers forms the basis for the selection of the most fundamental components of an LNAPL remediation/management strategy including the remedial technique, the level of aggressiveness, the scope of its implementation, and appropriate remedial end-points. Meaningful remedial drivers will ideally be based on a comprehensive LCSM that takes into account all pertinent technical and non-technical considerations.

Remedial drivers for LNAPL remediation can be categorized as risk-based drivers or non-risk factors (ASTM, 2007). Risk-based drivers refer to conditions resulting from the presence of the LNAPL body that represent unacceptable exposure scenarios that may be detrimental to human health or ecological receptors (e.g., an LNAPL body is producing soil gas VOC concentrations that are sufficiently elevated that vapor intrusion into indoor air may be hazardous to building occupants). Non-risk factors are usually based upon regulatory requirements or aesthetic concerns that are not related to any real risk concern at a given site (e.g., the common regulatory requirement to recover LNAPL whenever present in a well above an arbitrary in-well LNAPL thickness threshold). For obvious reasons, risk-based drivers are given priority over non-risk factors when establishing remedial drivers, and often necessitate more substantial (more aggressive, larger scale) remedial programs and/or controls compared with a LNAPL management strategy based on non-risk factors alone.

Risk-based drivers represent compositional concerns where a change in LNAPL chemistry may be advantageous to limit dissolution, volatilization, etc. of petroleum constituents (ITRC, 2009). Examples of compositional change techniques include enhanced biodegradation, in-situ chemical oxidation and air sparging. Non-risk or aesthetic drivers represent saturation-based concerns where the reduction of LNAPL saturations may be warranted to mitigate some issue with LNAPL mobility or migration (ITRC, 2009). Saturation-based remedial techniques are therefore based on the mass recovery of LNAPL. The draft RACER-MDEQ decision-making process (Figure 2) is organized to concurrently consider the different types of concerns since the associated remedial techniques may be different.

The typical potential risk-based drivers associated with the presence of LNAPL would be unacceptable levels of dissolved phase contamination, potential for direct contact, or soil vapor concerns. As noted in the LCSM discussion, quantitative risk assessment by ENVIRON concluded that there are no potentially unacceptable exposure scenarios associated with the Site LNAPL, with the exception of potential direct contact with one LNAPL constituent (chloromethane). The more recent December 2012 soil sampling results identified exceedances of residential and non-residential drinking water protection criteria for TCE.

As noted in the LCSM discussion, the drinking water pathway is not currently complete and is not expected to be complete in the future. In addition, the direct contact pathway is not currently complete at the Site and the implementation of an appropriate health and safety plan with any future soil excavation in the LNAPL area will most efficiently and effectively mitigate any potential future direct contact exposure concerns. The pathway through the draft LNAPL decision-making process with respect to the chloromethane compositional concern is shown in Figure 2.

Typical non-risk factors potentially applicable to the LNAPL that may necessitate LNAPL saturation reduction through mass recovery include the following:

- Unstable LNAPL body (i.e., LNAPL is migrating)
- LNAPL saturations significantly above residual saturation (i.e., presence of significant mobile/recoverable fraction)
- Presence of “readily recoverable” LNAPL (e.g., LNAPL transmissivity exceeds de minimis threshold)

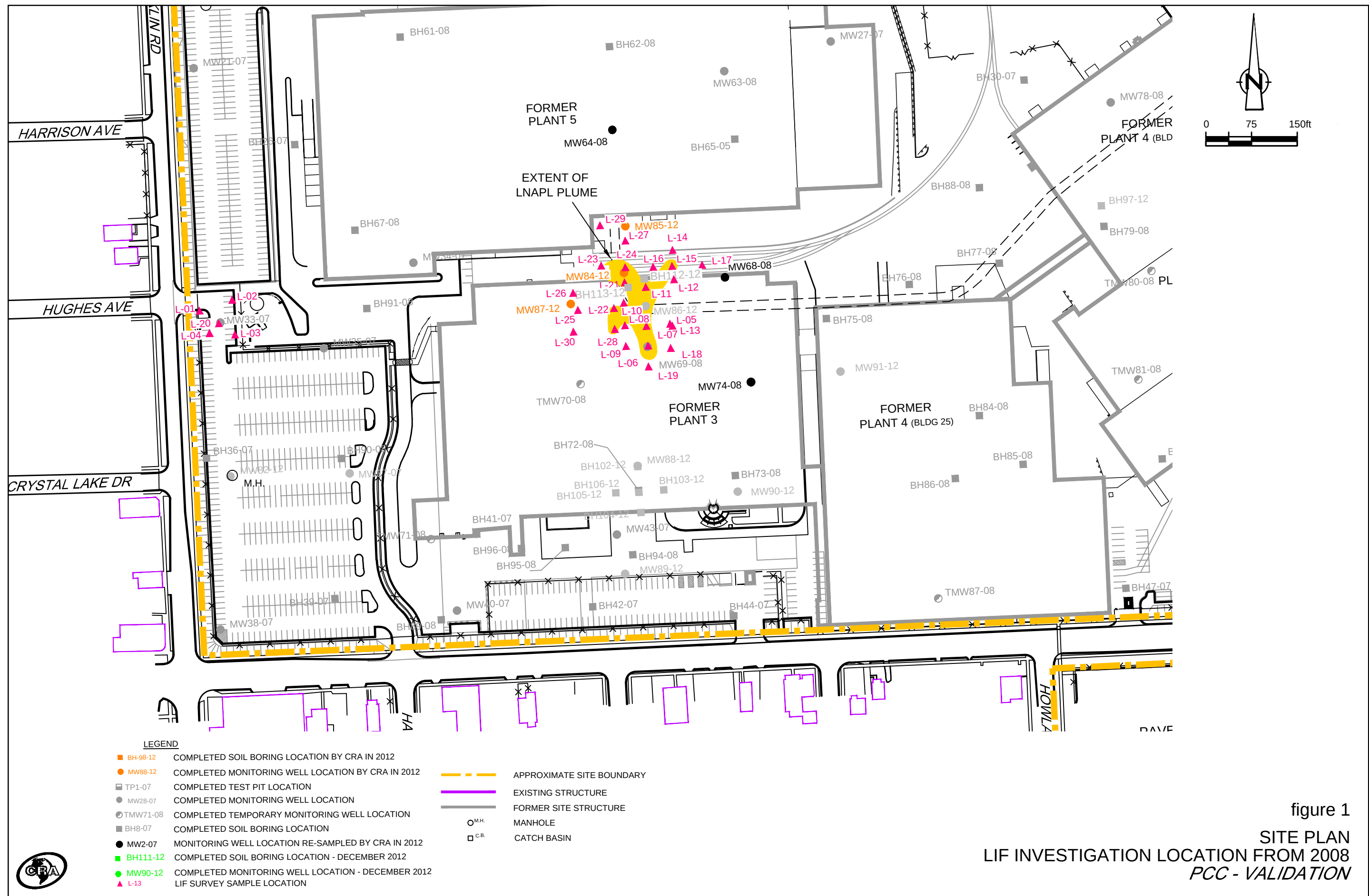
As previously discussed, there does not appear to be any reason to suspect the LNAPL may be unstable/migrating and the overall LNAPL mobility potential is low. The conclusion of the LCSM with respect to recoverability was that the consideration of multiple lines of evidence, most notably the lack of measureable LNAPL in wells, indicates that the LNAPL is not considered to be readily recoverable. Consequently, there are no applicable remedial drivers related to the reduction of the mobility of the LNAPL or the recovery of a significant recoverable fraction. The pathway through the draft LNAPL decision-making process with respect to potential saturation concerns is shown in Figure 2.

In summary, no remedial drivers are indicated on a saturation reduction basis and the only potential exposure issue is best mitigated through the implementation of an appropriate institutional control (HASP).

REFERENCES

- ASTM (ASTM International). 2007. *E 2531-06: Standard Guide for Development of Conceptual Site Models and Remediation Strategies for Light Nonaqueous-Phase Liquids Released to the Subsurface*. ASTM Committee E50 on Environmental Assessment, Risk management and Corrective Action, ASTM International, West Conshohocken, PA, February 2007.
- ITRC (Interstate Technology & Regulatory Council). 2009. *Evaluating LNAPL Remedial Technologies for Achieving Project Goals*. LNAPL-2. Washington, D.C.: Interstate Technology & Regulatory Council, LNAPLs Team. www.itrcweb.org.

FIGURES



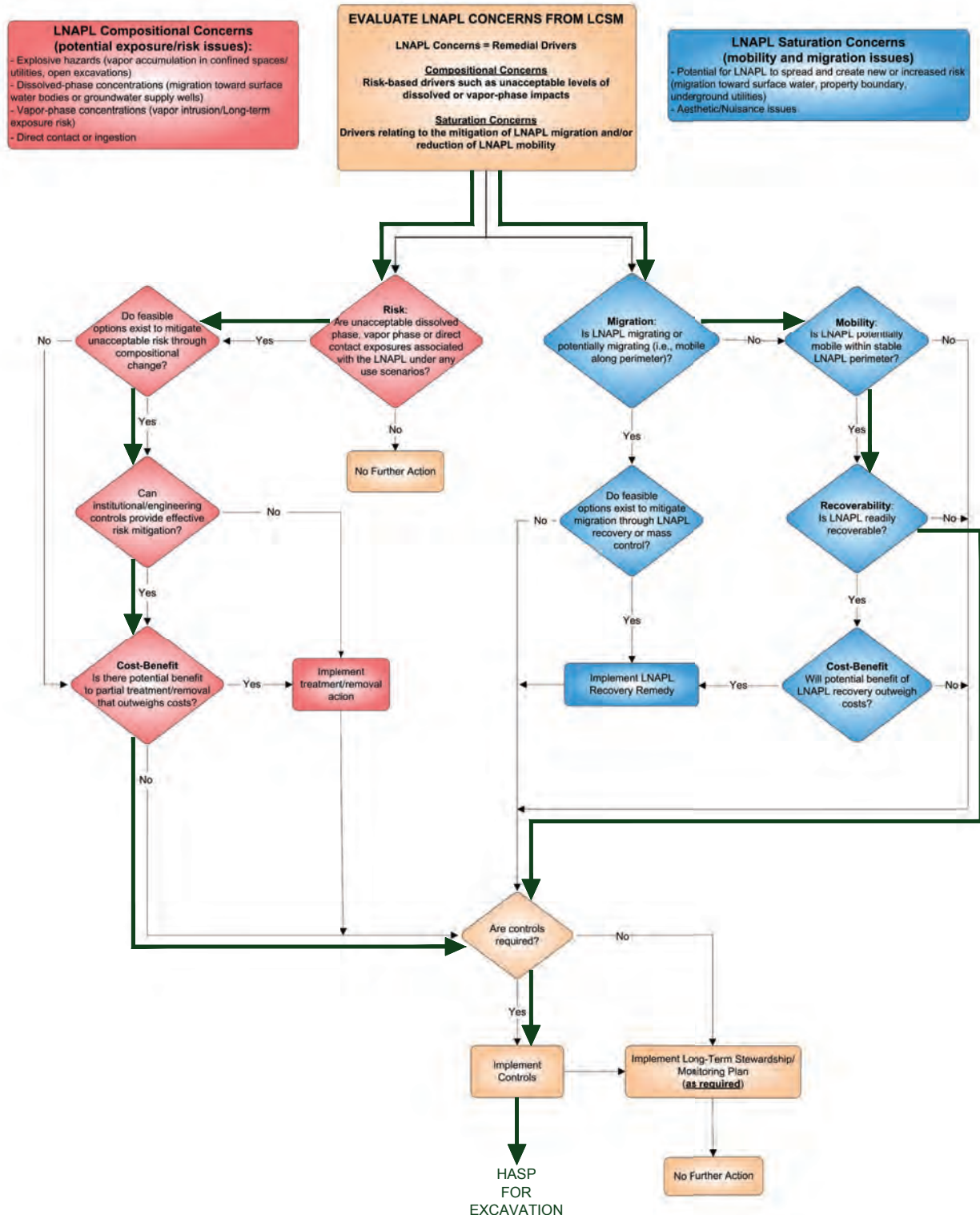


figure 2
LNAPL / RISK MANAGEMENT DECISION - MAKING PROCESS
RACER TRUST
PONTIAC VALIDATION CENTER
Pontiac, Michigan



TABLES

TABLE 1
SUMMARY OF SOIL CORE PETROPHYSICAL TEST RESULTS
RACER PCC - VALIDATION
PONTIAC, MICHIGAN

<i>Soil Core ID</i>	<i>Sub-Sample Selected for Analysis (feet bgs)</i>		<i>LNAPL Saturation Results</i>	
	<i>Residual Saturation by Water Drive</i>	<i>Pore Fluid Saturation Test</i>	<i>Initial Saturation (% of pore space)</i>	<i>Residual Saturation (% of pore space)</i>
MW84-12		6.6	12.8	--
MW84-12	11.45		11.5	>11.5
MW84-12	15.40		30.7	21.5
MW86-12		11.6	3.9	--
MW86-12	18.10		14.8	>14.8

Notes:

- Soil core analyses completed by PTS Laboratories, Santa Fe Springs, California

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
RACER PCC - VALIDATION
PONTIAC, MICHIGAN

	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and								
Sample Location:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	SB112-12	SB112-12	SB113-12	Trip Blank
Sample Depth:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact	16 ft BGS	5.5 ft BGS	17 ft BGS	-
Sample ID:	Value(2)	Value(2)	Protection	Protection	Interface Protection			S-17322-120512-DD-006	S-17322-120512-DD-005	S-17322-120512-DD-007	TB-17322
Sample Date:								12/05/2012	12/05/2012	12/05/2012	12/04/2012
Sample Type:											
Parameters	Units	a	a	b	c	d	p	q			
VOCs											
1,1,1-Trichloroethane	ug/kg		4000	4000	1800	460000 C	460000 C	34 U	63 U	37 U	30 U
1,1,2,2-Tetrachloroethane	ug/kg		170	700	1600 X	53000	240000	34 U	63 U	37 U	30 U
1,1,2-Trichloroethane	ug/kg		100	100	6600 X	180000	840000	34 U	63 U	37 U	30 U
1,1-Dichloroethane	ug/kg		18000	50000	15000	890000 C	890000 C	34 U	63 U	37 U	30 U
1,1-Dichloroethene	ug/kg		140	140	2600	200000	570000 C	34 U	63 U	37 U	30 U
1,2,4-Trichlorobenzene	ug/kg		4200	4200	5900 X	990000 DD	1100000 C,DD	34 U	63 U	37 U	30 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/kg		10 M	10 M	ID	1200 C	1200 C	34 U	63 U	37 U	30 U
1,2-Dibromoethane (Ethylene dibromide)	ug/kg		20 M	20 M	110 X	92	430	34 U	63 U	37 U	30 U
1,2-Dichlorobenzene	ug/kg		14000	14000	280	210000 C	210000 C	34 U	63 U	37 U	30 U
1,2-Dichloroethane	ug/kg		100	100	7200 X	91000	420000	34 U	63 U	37 U	30 U
1,2-Dichloropropane	ug/kg		100	100	4600 X	140000	550000 C	34 U	63 U	37 U	30 U
1,3-Dichlorobenzene	ug/kg		170	480	680	170000 C	170000 C	34 U	63 U	37 U	30 U
1,4-Dichlorobenzene	ug/kg		1700	1700	360	400000	1900000	34 U	63 U	37 U	30 U
2-Butanone (Methyl ethyl ketone) (MEK)	ug/kg		260000	760000	44000	27000000 C,DD	27000000 C,DD	230 U	420 U	250 U	200 U
2-Hexanone	ug/kg		20000	58000	ID	2500000 C	2500000 C	34 U	63 U	37 U	30 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	ug/kg		36000	100000	ID	2700000 C	2700000 C	34 U	63 U	37 U	30 U
Acetone	ug/kg		15000	42000	34000	23000000	73000000	110 U	210 U	120 U	100 U
Benzene	ug/kg		100	100	4000 X	180000	400000 C	34 U	63 U	37 U	30 U
Bromodichloromethane	ug/kg		1600 W	1600 W	ID	110000	490000	34 U	63 U	37 U	30 U
Bromoform	ug/kg		1600 W	1600 W	ID	820000	870000 C	34 U	63 U	37 U	30 U
Bromomethane (Methyl bromide)	ug/kg		200	580	700	320000	1000000	86 U	160 U	93 U	75 U
Carbon disulfide	ug/kg		16000	46000	ID	280000 C,DD	280000 C,DD	34 U	63 U	37 U	30 U
Carbon tetrachloride	ug/kg		100	100	900 X	96000	390000 C	34 U	63 U	37 U	30 U
Chlorobenzene	ug/kg		2000	2000	500	260000 C	260000 C	34 U	63 U	37 U	30 U
Chloroethane	ug/kg		8600	34000	22000 X	950000 C	950000 C	110 U	210 U	120 U	100 U
Chloroform (Trichloromethane)	ug/kg		1600 W	1600 W	7000	1200000	1500000 C	34 U	63 U	37 U	30 U
Chloromethane (Methyl chloride)	ug/kg		5200	22000	ID	1100000 C	1100000 C	110 U	210 U	120 U	100 U
cis-1,2-Dichloroethene	ug/kg		1400	1400	12000	640000 C	640000 C	34 U	63 U	37 U	30 U
cis-1,3-Dichloropropene	ug/kg							34 U	63 U	37 U	30 U
Cyclohexane	ug/kg							34 U	63 U	37 U	30 U
Dibromochloromethane	ug/kg		1600 W	1600 W	ID	110000	500000	34 U	63 U	37 U	30 U
Dichlorodifluoromethane (CFC-12)	ug/kg		95000	270000	ID	1000000 C	1000000 C	34 U	63 U	37 U	30 U
Ethylbenzene	ug/kg		1500	1500	360	140000 C	140000 C	34 U	63 U	37 U	30 U
Isopropyl benzene	ug/kg		91000	260000	3200	390000 C	390000 C	34 U	63 U	37 U	30 U
Methyl acetate	ug/kg							230 U	420 U	250 U	200 U
Methyl cyclohexane	ug/kg							34 U	63 U	37 U	30 U
Methyl tert butyl ether (MTBE)	ug/kg		800	800	140000 X	1500000	5900000 C	34 U	63 U	37 U	30 U
Methylene chloride	ug/kg		100	100	30000 X	1300000	2300000 C	34 U	63 U	37 U	30 U
Styrene	ug/kg		2700	2700	2100 X	400000	520000 C	34 U	63 U	37 U	30 U
Tetrachloroethene	ug/kg		100	100	1200 X	88000 C	88000 C	34 U	63 U	37 U	30 U
Toluene	ug/kg		16000	16000	5400	250000 C	250000 C	34 U	63 U	37 U	30 U
trans-1,2-Dichloroethene	ug/kg		2000	2000	30000 X	1400000 C	1400000 C	34 U	63 U	37 U	30 U
trans-1,3-Dichloropropene	ug/kg							34 U	63 U	37 U	30 U
Trichloroethene	ug/kg		100	100	4000 X	500000 C,DD	500000 C,DD	330 ^{RC}	63 U	37 U	30 U
Trichlorofluoromethane (CFC-11)	ug/kg		52000	150000		560000 C	560000 C	34 U	63 U	37 U	30 U
Trifluorotrichloroethane (Freon 113)	ug/kg		550000 C	550000 C	1700	550000 C	550000 C	34 U	63 U	37 U	30 U
Vinyl chloride	ug/kg		40	40	260 X	3800	34000	34 U	63 U	37 U	30 U
Xylenes (total)	ug/kg		5600	5600	820	150000 C	150000 C	100 U	190 U	110 U	90 U
SVOCs											
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg							180 U	1900 U	190 U	--
2,4,5-Trichlorophenol	ug/kg		39000	110000		23000000	73000000	180 U	1900 U	190 U	--
2,4,6-Trichlorophenol	ug/kg		2400	9400	330 M	710000	3300000	180 U	1900 U	190 U	--
2,4-Dichlorophenol	ug/kg		1500	4200	330 M	660000 DD	1800000 C,DD	180 U	1900 U	190 U	--
2,4-Dimethylphenol	ug/kg		7400	20000	7600	11000000	36000000	380 U	4000 U	390 U	--
2,4-Dinitrophenol	ug/kg							760 U	7900 U	770 U	--

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
RACER PCC - VALIDATION
PONTIAC, MICHIGAN

	Sandy (shallower) soils	Clay (deeper) soils	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾					SB112-12 16 ft BGS	SB112-12 5.5 ft BGS	SB113-12 17 ft BGS	Trip Blank
Sample Location:	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential				-
Sample Depth:	Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact	S-17322-120512-DD-006	S-17322-120512-DD-005	S-17322-120512-DD-007	TB-17322
Sample ID:	Value(2)	Value(2)	Protection	Protection	Interface Protection			12/05/2012	12/05/2012	12/05/2012	12/04/2012
Sample Date:											
Sample Type:											
Parameters	Units	a	a	b	c	d	p	q			
2,4-Dinitrotoluene	ug/kg			430	640		48000	220000	180 U	1900 U	190 U
2,6-Dinitrotoluene	ug/kg								180 U	1900 U	190 U
2-Chloronaphthalene	ug/kg			620000	1800000		56000000	180000000	92 U	960 U	93 U
2-Chlorophenol	ug/kg			900	2600	360	1400000	4500000	180 U	1900 U	190 U
2-Methylnaphthalene	ug/kg			57000	170000	4200	8100000	26000000	21 J	960 U	93 U
2-Methylphenol	ug/kg			7400	20000	1000 M	11000000	36000000	180 U	1900 U	190 U
2-Nitroaniline	ug/kg								760 U	7900 U	770 U
2-Nitrophenol	ug/kg			400	1200	ID	630000	2000000	180 U	1900 U	190 U
3,3'-Dichlorobenzidine	ug/kg			2000 M	2000 M	2000 M	6600	30000	7600 U	7900 U	7700 U
3-Nitroaniline	ug/kg								760 U	7900 U	770 U
4,6-Dinitro-2-methylphenol	ug/kg			830 M	830 M		79000	260000	380 U	4000 U	390 U
4-Bromophenyl phenyl ether	ug/kg								180 U	1900 U	190 U
4-Chloro-3-methylphenol	ug/kg			5800	16000	280	4500000	15000000	180 U	1900 U	190 U
4-Chloroaniline	ug/kg								380 U	4000 U	390 U
4-Chlorophenyl phenyl ether	ug/kg								180 U	1900 U	190 U
4-Methylphenol	ug/kg			7400	20000	1000 M	11000000	36000000	180 U	1900 U	190 U
4-Nitroaniline	ug/kg								760 U	7900 U	770 U
4-Nitrophenol	ug/kg								760 U	7900 U	770 U
Acenaphthene	ug/kg			300000	880000	8700	41000000	130000000	34 U	360 U	35 U
Acenaphthylene	ug/kg			5900	17000	ID	1600000	5200000	34 U	360 U	35 U
Acetophenone	ug/kg			30000	88000	ID	1100000 C	1100000 C	380 U	4000 U	390 U
Anthracene	ug/kg			41000	41000	ID	230000000	730000000	34 U	360 U	35 U
Atrazine	ug/kg			60	60	150	71000 DD	330000 DD	380 U	4000 U	390 U
Benzaldehyde	ug/kg								380 U	4000 U	390 U
Benzo(a)anthracene	ug/kg			NLL	NLL	NLL	20000	80000	340 U	360 U	350 U
Benzo(a)pyrene	ug/kg			NLL	NLL	NLL	2000	8000	340 U	360 U	350 U
Benzo(b)fluoranthene	ug/kg			NLL	NLL	NLL	20000	80000	340 U	360 U	350 U
Benzo(g,h,i)perylene	ug/kg			NLL	NLL	NLL	2500000	7000000	340 U	360 U	350 U
Benzo(k)fluoranthene	ug/kg			NLL	NLL	NLL	200000	800000	340 U	360 U	350 U
Biphenyl (1,1-Biphenyl)	ug/kg								380 U	4000 U	390 U
bis(2-Chloroethoxy)methane	ug/kg								180 U	1900 U	190 U
bis(2-Chloroethyl)ether	ug/kg			100	170	100 M	13000	58000	110 U	1200 U	120 U
bis(2-Ethylhexyl)phthalate (DEHP)	ug/kg			NLL	NLL	NLL	2800000	10000000 C	3800 U	4000 U	3900 U
Butyl benzylphthalate (BBP)	ug/kg			310000 C	310000 C	120000 X	310000 C	310000 C	1800 U	1900 U	1900 U
Caprolactam	ug/kg			120000	340000		53000000 DD	310000000 DD	180 J	4000 U	82 J
Carbazole	ug/kg			9400	39000	1100	530000	2400000	180 U	1900 U	190 U
Chrysene	ug/kg			NLL	NLL	NLL	2000000	8000000	340 U	720	350 U
Dibenz(a,h)anthracene	ug/kg			NLL	NLL	NLL	2000	8000	340 U	360 U	350 U
Dibenzofuran	ug/kg			ID	ID	1700	ID	ID	180 U	1900 U	190 U
Diethyl phthalate	ug/kg			110000	320000	2200	740000 C	740000 C	380 U	4000 U	390 U
Dimethyl phthalate	ug/kg			790000 C	790000 C		790000 C	790000 C	380 U	4000 U	390 U
Di-n-butylphthalate (DBP)	ug/kg			760000 C	760000 C	11000	760000 C	760000 C	380 U	4000 U	390 U
Di-n-octyl phthalate (DnOP)	ug/kg			100000000	140000000 C	ID	6900000	20000000	1800 U	1900 U	1900 U
Fluoranthene	ug/kg			730000	730000	5500	46000000	130000000	34 U	360 U	35 U
Fluorene	ug/kg			390000	890000	5300	27000000	87000000	34 U	360 U	35 U
Hexachlorobenzene	ug/kg			1800	1800	350	8900	37000	180 U	1900 U	190 U
Hexachlorobutadiene	ug/kg			26000	72000	91	100000	350000 C	57 U	600 U	58 U
Hexachlorocyclopentadiene	ug/kg			320000	320000	ID	720000 C	720000 C	380 U	4000 U	390 U
Hexachloroethane	ug/kg			430	1200	1800 X	230000	730000	180 U	1900 U	190 U
Indeno(1,2,3-cd)pyrene	ug/kg			NLL	NLL	NLL	20000	80000	340 U	360 U	350 U
Isophorone	ug/kg			15000	62000	26000 X	2400000 C	2400000 C	180 U	1900 U	190 U
Naphthalene	ug/kg			35000	100000	730	16000000	52000000	34 U	360 U	35 U
Nitrobenzene	ug/kg			330 M	330 M	3600 X	100000	340000	180 U	1900 U	190 U
N-Nitrosodi-n-propylamine	ug/kg			330 M	330 M		1200	5400	180 U	1900 U	190 U
N-Nitrosodiphenylamine	ug/kg			5400	22000		1700000	7800000	180 U	1900 U	190 U
Pentachlorophenol	ug/kg			22	22	G, X	90000	320000	34 U	360 U	35 U
Phenanthrene	ug/kg			56000	160000	2100	1600000	5200000	79	360 U	35 U
Phenol	ug/kg			88000	260000	9000	12000000 C,DD	12000000 C,DD	180 U	1900 U	190 U
Pyrene	ug/kg			480000	480000	ID	29000000	84000000	340 U	200 J	350 U

TABLE 2
SUMMARY OF SOIL ANALYTICAL RESULTS
RACER PCC - VALIDATION
PONTIAC, MICHIGAN

Sample Location: Sample Depth: Sample ID: Sample Date: Sample Type:	Michigan Act 451, Part 201 Cleanup Criteria and Part 213 Risk-based Screening Levels: Residential and Non-Residential Generic Cleanup Criteria ⁽¹⁾											
	Sandy (shallower) soils	Clay (deeper) soils							SB112-12	SB112-12	SB113-12	Trip Blank
	Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	16 ft BGS	5.5 ft BGS	17 ft BGS	-	
	Background Value(2)	Background Value(2)	Drinking Water Protection	Drinking Water Protection	Surface Water Interface Protection	Direct Contact	Direct Contact	S-17322-120512-DD-006 12/05/2012	S-17322-120512-DD-005 12/05/2012	S-17322-120512-DD-007 12/05/2012	TB-17322 12/04/2012	
Parameters	Units	a	a	b	c	d	p	q				
Metals												
Aluminum	ug/kg	10800000	12000000	1000	1000		50000000 DD	370000000 DD	5100000	17000000 ^{abc}	3600000	--
Antimony	ug/kg	80 J	160 J	4300	4300	94000 X	180000	670000	93 J ^a	52 J	110 J ^a	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	3000	6100	2100	--
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	29000	73000	17000	--
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	300 J	860 ^a	150 J	--
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	110 J	96 J	77 J	--
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	10000	21000 ^{ad}	7100	--
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	4800	8500	2700	--
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	12000	16000	11000	--
Iron	ug/kg	24400000	22000000	6000	6000		160000000	580000000	11000000	26000000 ^{abc}	11000000	--
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	6600	11000	5600	--
Manganese	ug/kg	4560000	677000	1000	1000	G, X	25000000	90000000	390000	280000	320000	--
Mercury	ug/kg	54.1	52 U	1700	1700	50 M	160000	580000	23	95 ^{au}	22	--
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	13000	23000 ^a	7500	--
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	830 ^{au}	1600 ^{au}	740	--
Silver	ug/kg	95 UJ	66.1	4500	13000	100 M	2500000	9000000	16 J	17 J	26 J	--
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	190 J	230 J ^a	83 J	--
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	13000	30000 ^a	11000	--
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	27000	44000	21000	--
PCBs												
Aroclor-1016 (PCB-1016)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1221 (PCB-1221)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1232 (PCB-1232)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1242 (PCB-1242)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1248 (PCB-1248)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1254 (PCB-1254)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
Aroclor-1260 (PCB-1260)	ug/kg			NLL	NLL	NLL	4000 T	16000 T	45 U	46 U	46 U	--
General Chemistry												
Moisture content (dry weight)	%								13	18	16	--

Notes:
If results are below select background level, all other criteria are not applicable
U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

(1) Cleanup criteria identified by MDEQ RRD Op Memo No. 1, updated 9/28/2012, pursuant to 1994 PA 451 as amended.
(2) Select background levels calculated following MDEQ, 2002, Sampling Strategies and Statistics Training Materials for Part 201 Cleanup Criteria.
NA - Criteria not available or not applicable

- Indicates concentration exceeded Part 201 Cleanup Criteria

Attachment A

Laboratory Soil Physical Property Results



Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-144
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	4.3 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	Clayey SILT, with sand, trace gravel

Specimen conditions:		Initial	Final
Diameter	cm	3.788	
Length	cm	4.0595	
Volume	cm ³	45.75	
Wet Mass	gr.	101.7	102.5
Dry Density	kg/m ³	1954	
Water content	%	13.8	14.7

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	206.00
Back pressure	kPa	192.00
Volume under steady state flow	cm ³	0.3-0.9
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.49E-08



**Measurement of Hydraulic Conductivity of Saturated Porous Material Using a
Flexible Wall Permeameter**

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-143
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	5.2 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	SILT with clay

Specimen conditions:		Initial	Final
Diameter	cm	3.72	
Length	cm	3.8745	
Volume	cm ³	42.11	
Wet Mass	gr.	93.7	90.4
Dry Density	kg/m ³	1783	
Water content	%	24.8	20.1

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	182.00
Back pressure	kPa	168.00
Volume under steady state flow	cm ³	0.3-3.3
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.39E-07



Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-142
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	5.5 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	SAND and SILT, with clay, trace gravel

Specimen conditions:		Initial	Final
Diameter	cm	3.7945	
Length	cm	4.0675	
Volume	cm ³	46.00	
Wet Mass	gr.	108	106.8
Dry Density	kg/m ³	2113	
Water content	%	11.1	9.9

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	172.00
Back pressure	kPa	158.00
Volume under steady state flow	cm ³	0.4-0.6
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.69E-08



Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-142
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	5.5 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	SAND and SILT, with clay, trace gravel

Specimen conditions:		Initial
Diameter	cm	3.7945
Length	cm	4.0675
Volume	cm ³	46.00
Wet Mass	gr.	108
Dry Density	kg/m ³	2348
Water content	%	0.0

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	172.00
Back pressure	kPa	158.00
Volume under steady state flow	cm ³	0.4-0.6
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.69E-08



Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-143
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	5.2 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	SILT with clay

Specimen conditions:		Initial
Diameter	cm	3.72
Length	cm	3.8745
Volume	cm ³	42.11
Wet Mass	gr.	93.7
Dry Density	kg/m ³	2225
Water content	%	0.0

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	182.00
Back pressure	kPa	168.00
Volume under steady state flow	cm ³	0.3-3.3
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.39E-07



Measurement of Hydraulic Conductivity of Saturated Porous Material Using a Flexible Wall Permeameter

**Constant Head Method
(ASTM D-5084)**

SAMPLE IDENTIFICATION

Sample No.	SO-17322-121007-CB-144
Type of specimen	Geoprobe
Depth of undisturbed sample, ft/m.	4.3 m

Date	10-Dec-07
Project No.	17322-04
Site	GM Validation, Syracuse, NY

Specimen description	Clayey SILT, with sand, trace gravel

Specimen conditions:		Initial
Diameter	cm	3.788
Length	cm	4.0595
Volume	cm ³	45.75
Wet Mass	gr.	101.7
Dry Density	kg/m ³	2223
Water content	%	0.0

Permeation condition		
Cell pressure	kPa	300.00
Head pressure	kPa	206.00
Back pressure	kPa	192.00
Volume under steady state flow	cm ³	0.3-0.9
Hydraulic gradient, l	-	14.0

HYDRAULIC CONDUCTIVITY, cm/s	1.49E-08



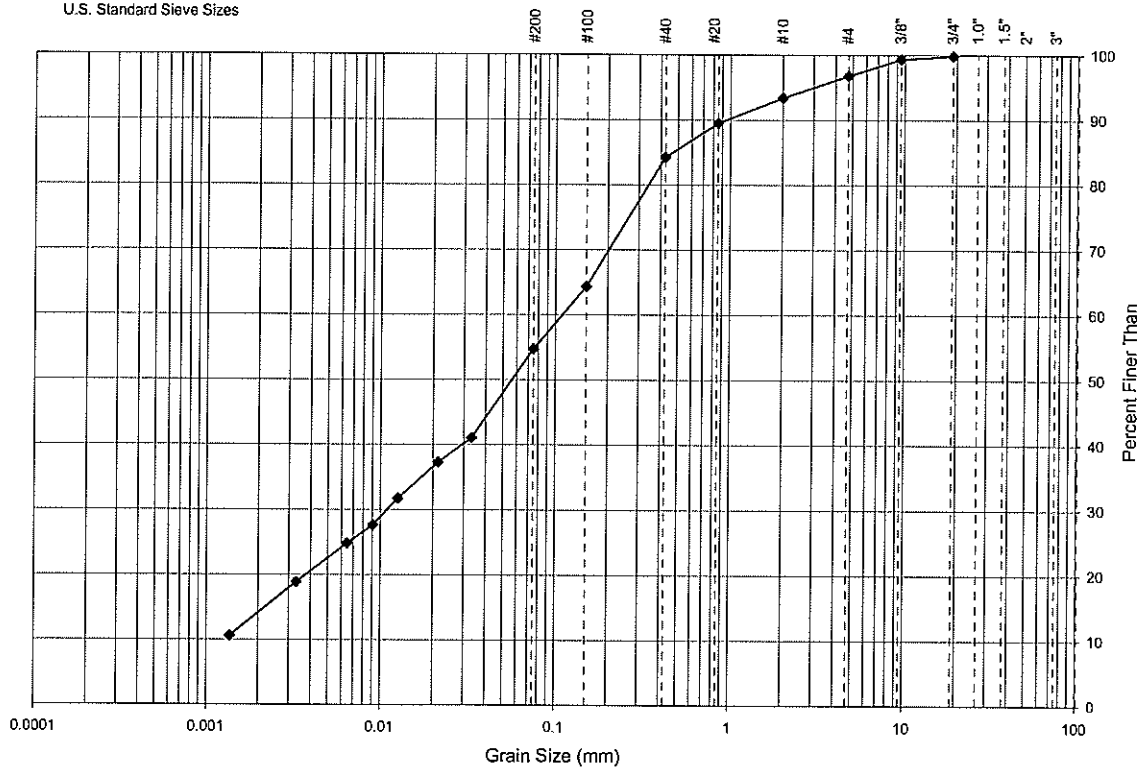
SAMPLE DATE: December 10, 2007
 SAMPLE LOCATION: -
 SAMPLE No.: SO-17322-121007-CB-142
 SAMPLE DEPTH: 5.5 m
 SAMPLED BY: Corrie Bondy

PROJECT: GM Validation,
 LOCATION: Syracuse, NY
 CLIENT : CRA
 PROJECT NO.: 17322-04

TEST DATE: January 14, 2008
 TESTED BY: NK/DO
 LAB No. : WL- 892-1

CLAY	SILT	SAND SIZES			GRAVEL		COBBLES
		FINE	MEDIUM	COARSE	FINE	COARSE	

U.S. Standard Sieve Sizes



PARTICLE SIZE DISTRIBUTION

DESCRIPTION	SOIL CLASSIFICATION DESCRIPTIVE MODIFIERS		SUMMARY
SAND and SILT, with clay, trace gravel	AND	36 - 50 %	GRAVEL 3 %
	ADJECTIVE (e.g. sandy)	21 - 35 %	SAND 42 %
	WITH	11 - 20 %	SILT + CLAY 55 %
	TRACE	1 - 10 %	



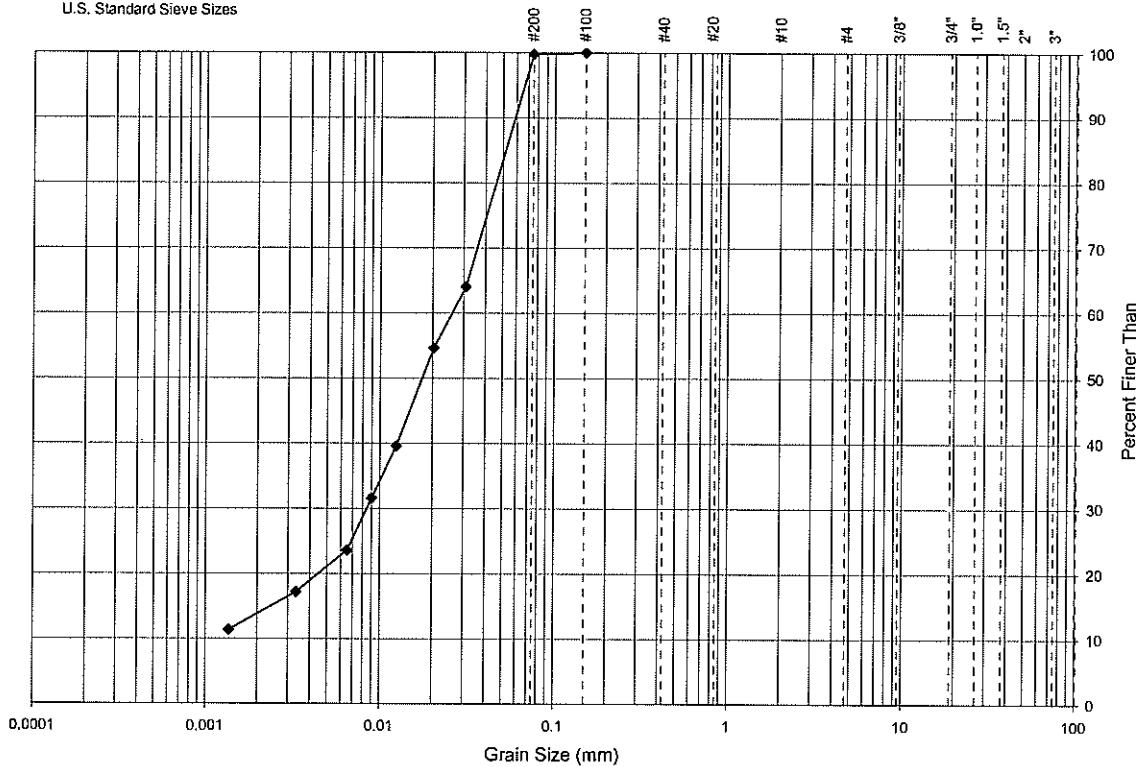
SAMPLE DATE: December 10, 2007
 SAMPLE LOCATION: -
 SAMPLE No.: SO-17322-121007-CB-143
 SAMPLE DEPTH: 5.2 m
 SAMPLED BY: Corrie Bondy

PROJECT: GM Validation,
 LOCATION: Syracuse, NY
 CLIENT : CRA
 PROJECT NO.: 17322-04

TEST DATE: January 14, 2008
 TESTED BY: NK/DO
 LAB No. : WL- 892-2

CLAY	SILT	SAND SIZES			GRAVEL		COBBLES
		FINE	MEDIUM	COARSE	FINE	COARSE	

U.S. Standard Sieve Sizes



PARTICLE SIZE DISTRIBUTION

DESCRIPTION	SOIL CLASSIFICATION DESCRIPTIVE MODIFIERS		SUMMARY
SILT with clay	AND	36 - 50 %	GRAVEL 0 %
	ADJECTIVE (e.g. sandy)	21 - 35 %	SAND 0 %
	WITH	11 - 20 %	SILT + CLAY 100 %
	TRACE	1 - 10 %	



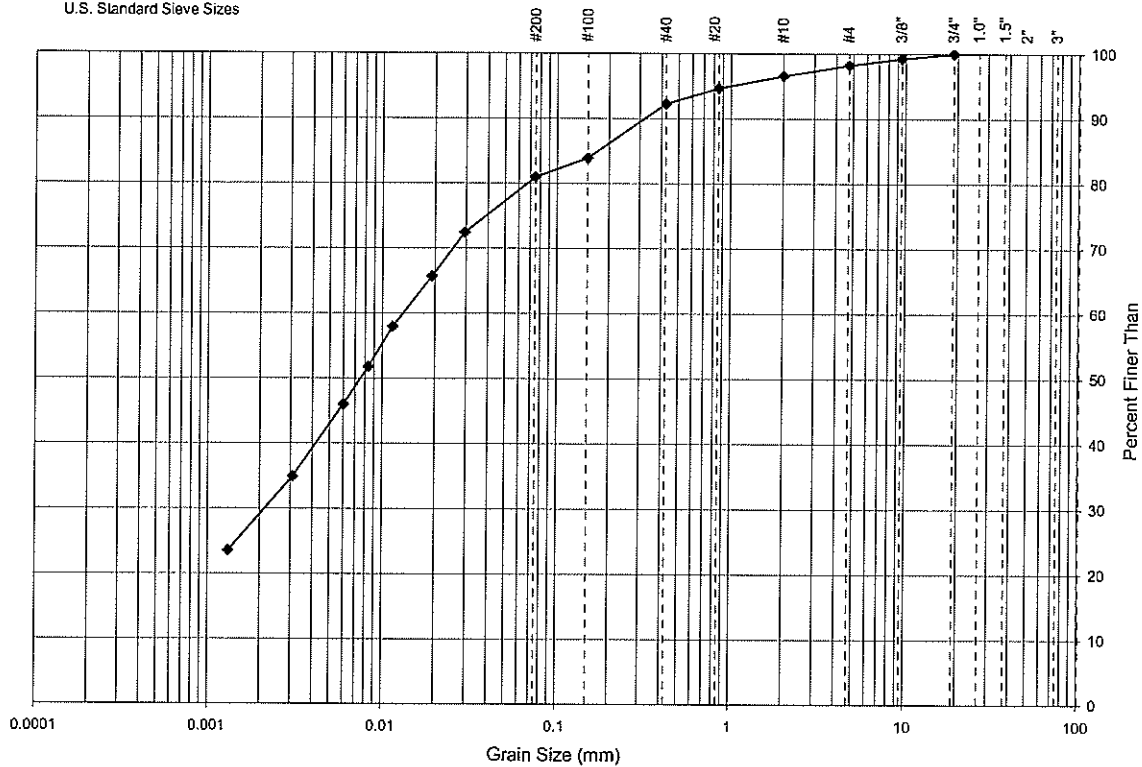
SAMPLE DATE: December 10, 2007
 SAMPLE LOCATION: -
 SAMPLE No.: SO-17322-121007-CB-144
 SAMPLE DEPTH: 4.3 m
 SAMPLED BY: Corrie Bondy

PROJECT: GM Validation,
 LOCATION: Syracuse, NY
 CLIENT : CRA
 PROJECT NO.: 17322-04

TEST DATE: January 14, 2008
 TESTED BY: NK/DO
 LAB No.: WL- 892-3

CLAY	SILT	SAND SIZES			GRAVEL		COBBLES
		FINE	MEDIUM	COARSE	FINE	COARSE	

U.S. Standard Sieve Sizes



PARTICLE SIZE DISTRIBUTION

DESCRIPTION	SOIL CLASSIFICATION DESCRIPTIVE MODIFIERS		SUMMARY
Clayey SILT, with sand, trace gravel	AND	36 - 50 %	GRAVEL 2 %
	ADJECTIVE (e.g. sandy)	21 - 35 %	SAND 17 %
	WITH	11 - 20 %	SILT + CLAY 81 %
	TRACE	1 - 10 %	

Attachment B

Laboratory LNAPL Forensic Testing/Fingerprinting Results

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
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FAX: (206) 283-5044
e-mail: fbi@isomedia.com

May 20, 2008

Denise Heckler, Project Manager
TestAmerica Laboratories, Inc.
4101 Shuffel Drive N.W.
North Canton, OH 44720

Dear Ms. Heckler:

Included are the results from the testing of material submitted on May 15, 2008 from the KM54H, F&BI 805139 project. The product sample submitted for forensic evaluation arrived in good condition. Upon arrival, the sample LNAPL-17322-040308-CB-001 was placed in a refrigerator maintained at 4°C until removed for sample processing.

The sample LNAPL-17322-040308-CB-001 was diluted and analyzed using a gas chromatograph with a flame ionization detector (GC/FID). The data generated yielded information on the boiling range and general chemical composition of the material present. The GC/FID traces are enclosed. A GC/FID trace of a standard consisting of normal alkanes is also provided for reference purposes.

Please contact us if additional consultation is needed by our firm in the interpretation of the analytical results provided. We appreciate this opportunity to be of service to you and hope you will call if you should have any questions. We will hold your samples for 30 days before disposal unless directed otherwise.

Sincerely,

FRIEDMAN & BRUYA, INC.



Kurt Johnson
Chemist

Enclosures
es/KJ
NAA0520R.DOC

Date of Report: 05/20/08

Date Received: 05/15/08

Project: KM54H, F&BI 805139

Date Extracted: 05/19/08

Date Analyzed: 05/19/08

**RESULTS FROM THE ANALYSIS OF THE PRODUCT SAMPLE
FOR FORENSIC EVALUATION
BY CAPILLARY GAS CHROMATOGRAPHY
USING A FLAME IONIZATION DETECTOR (FID)**

Sample ID

GC Characterization

LNAPL-17322-040308-
CB-001

The GC trace using the flame ionization detector (FID) showed the presence of medium boiling compounds. The patterns displayed by these peaks are indicative of a middle distillate such as diesel fuel, kerosene or similar materials.

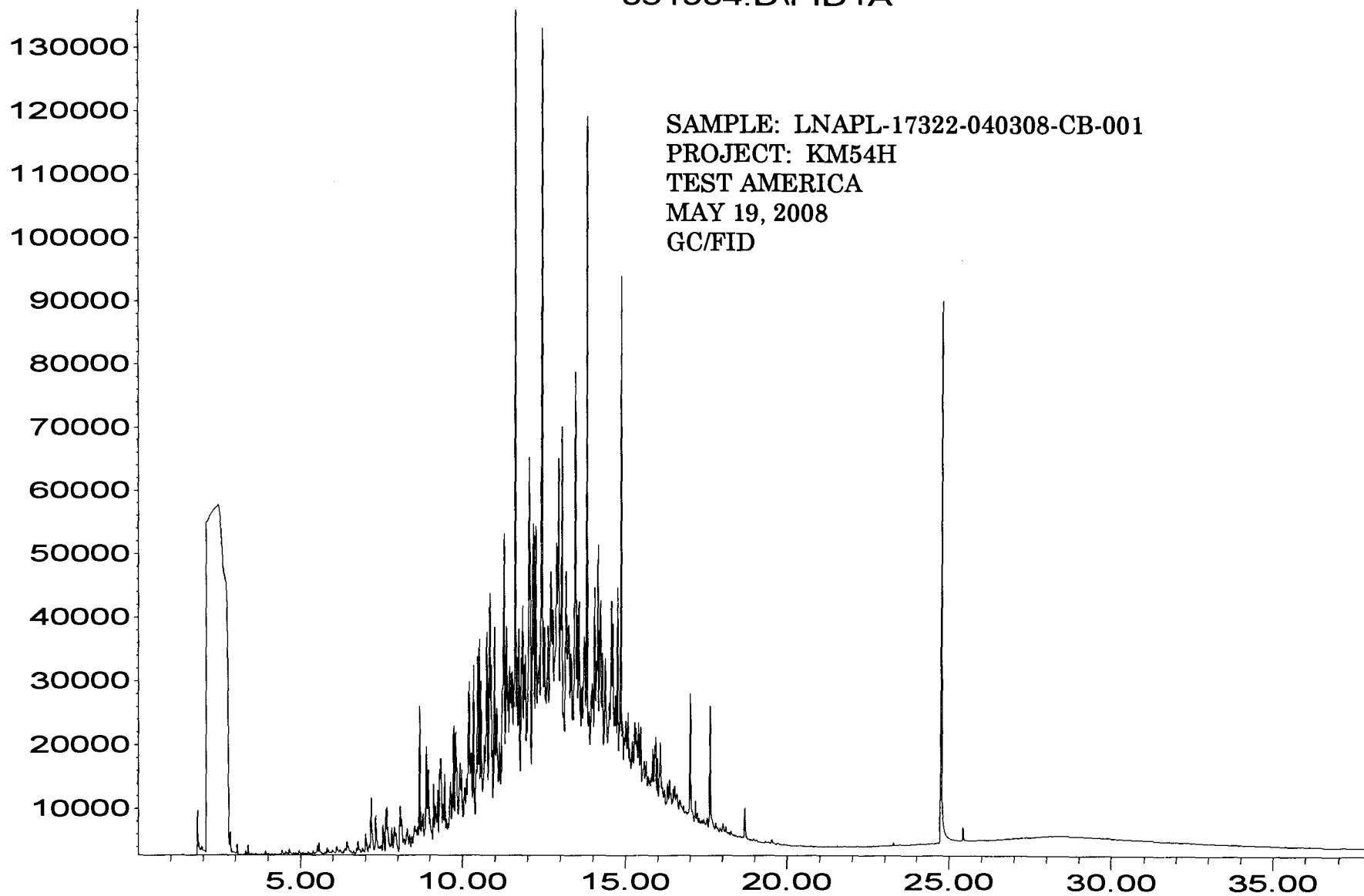
The medium boiling compounds appear as an irregular pattern of peaks on top of a broad hump or unresolved complex mixture (UCM). This material elutes from n -C₁₀ to n -C₂₄ showing a maximum near n -C₁₆. This correlates with a temperature range of approximately 170°C to 390°C with a maximum near 290°C. Within this range, the dominant peaks present are indicative of isoprenoids including norpristane, pristane, and phytane. A discernible pattern of peaks characteristic of the normal alkanes was not present. The abundance of isoprenoids in conjunction with the apparent absence of normal alkanes indicates that the fuel present has undergone substantial biological degradation.

The large peak seen near 25 minutes on the GC/FID trace is pentacosane, added as a quality assurance check for this GC analysis.

Response_

051904.D\FID1A

SAMPLE: LNAPL-17322-040308-CB-001
PROJECT: KM54H
TEST AMERICA
MAY 19, 2008
GC/FID

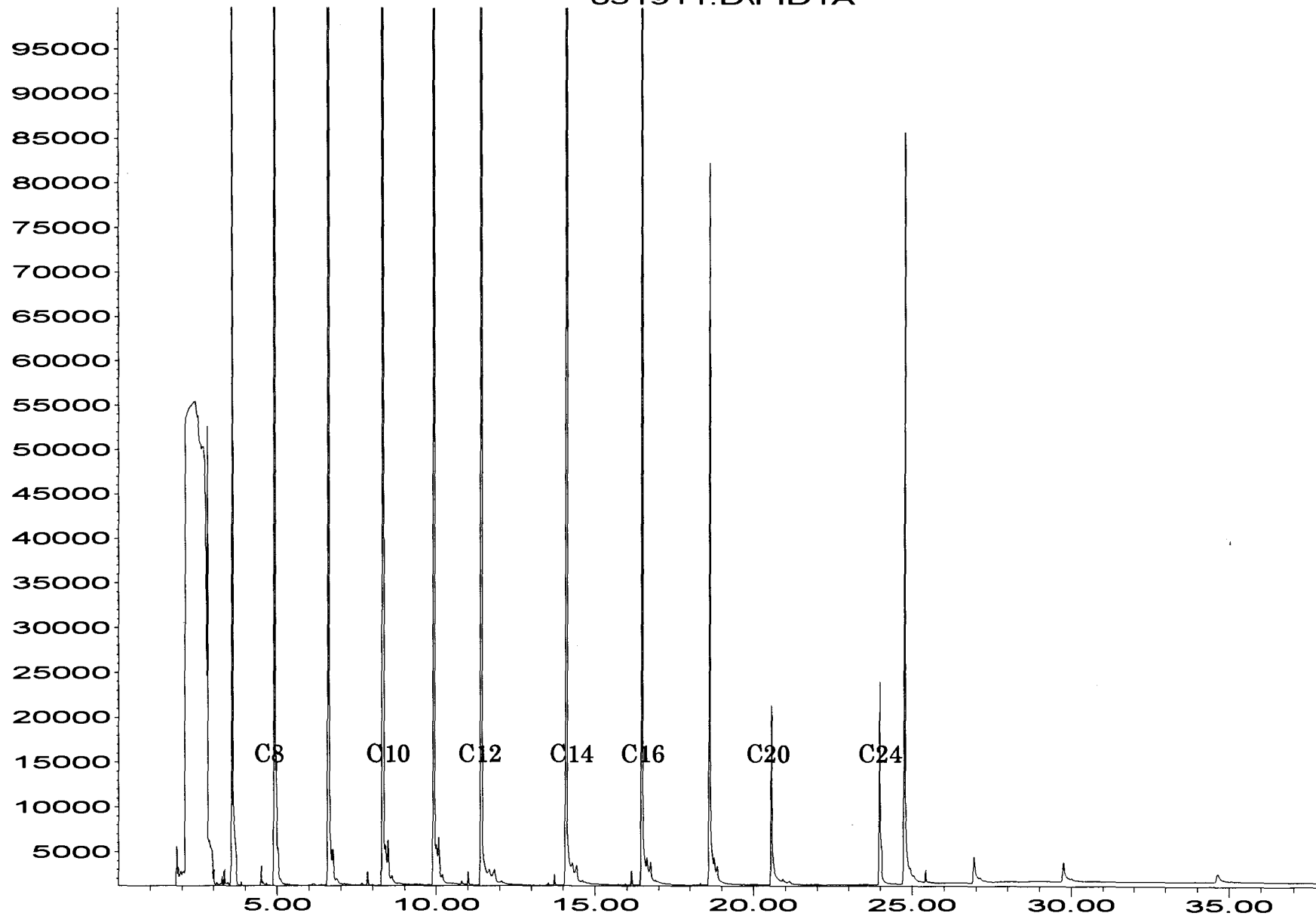


Time

Response_

N-ALKANE STANDARD
GC/FID

051911.D\FID1A

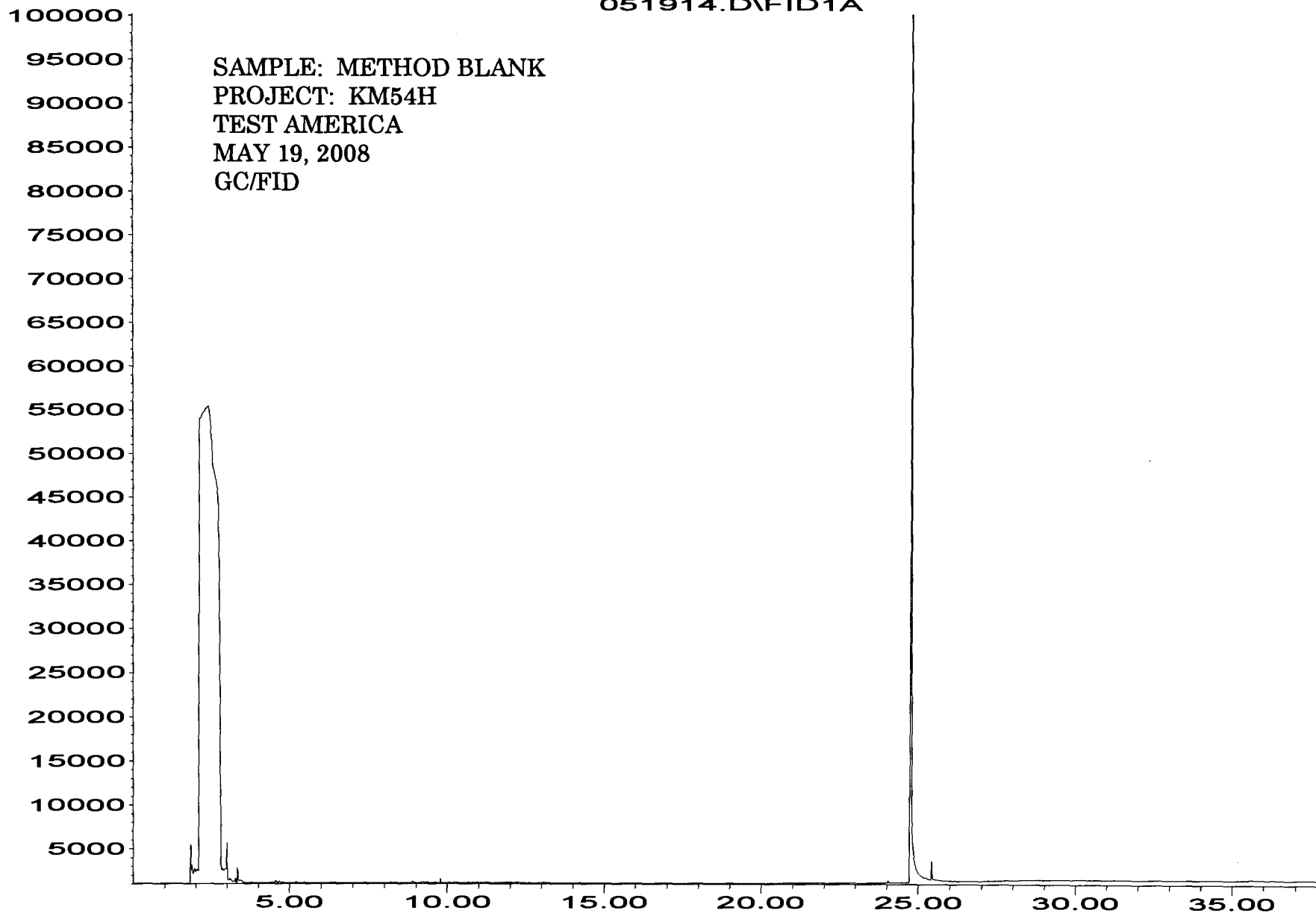


Time

Response__

051914.D\FID1A

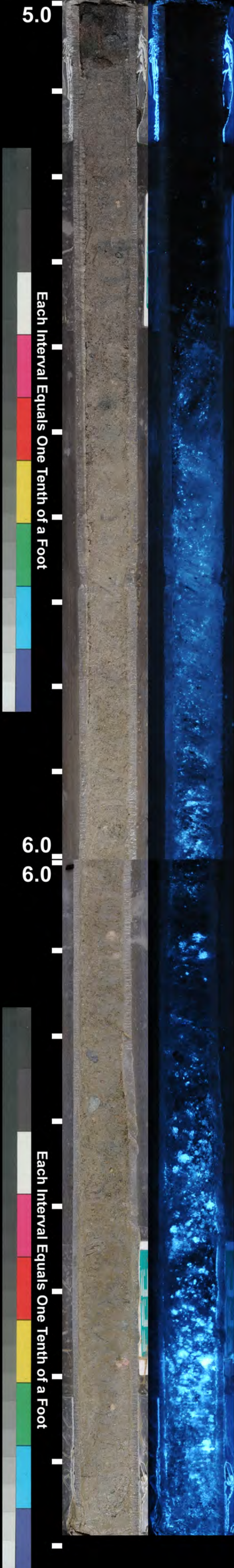
SAMPLE: METHOD BLANK
PROJECT: KM54H
TEST AMERICA
MAY 19, 2008
GC/FID



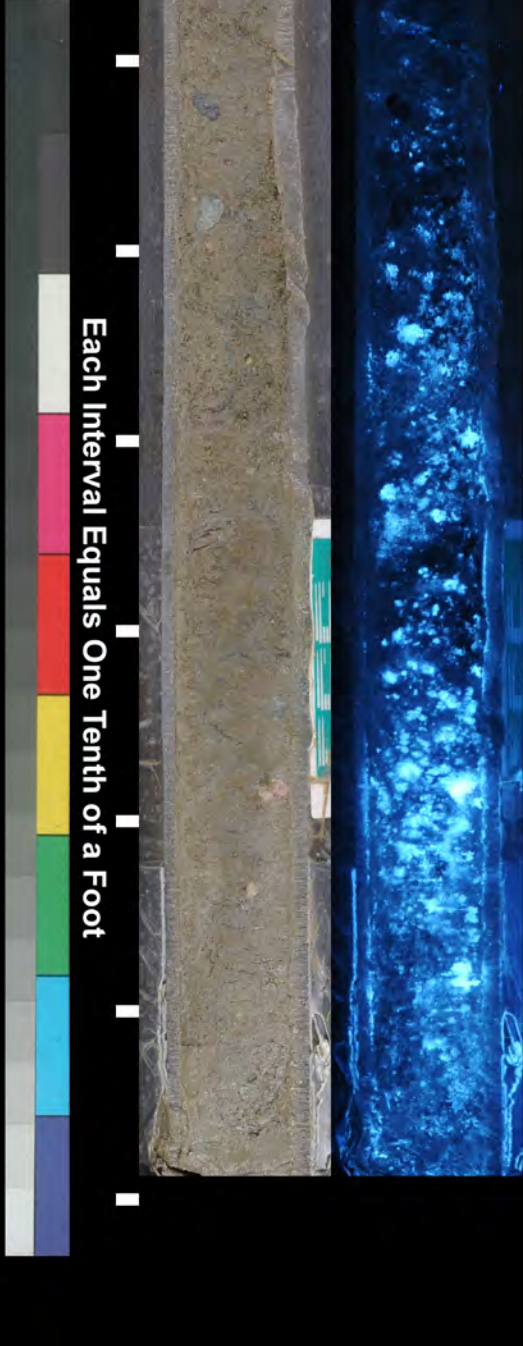
Time

Attachment C

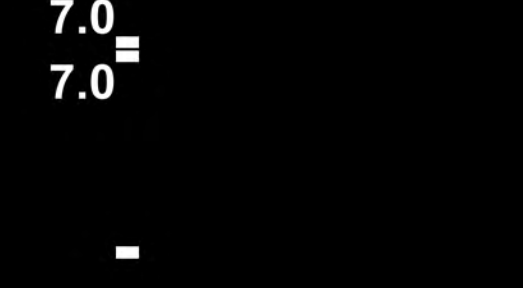
Laboratory Soil Core Photography and Petrophysical Test Results



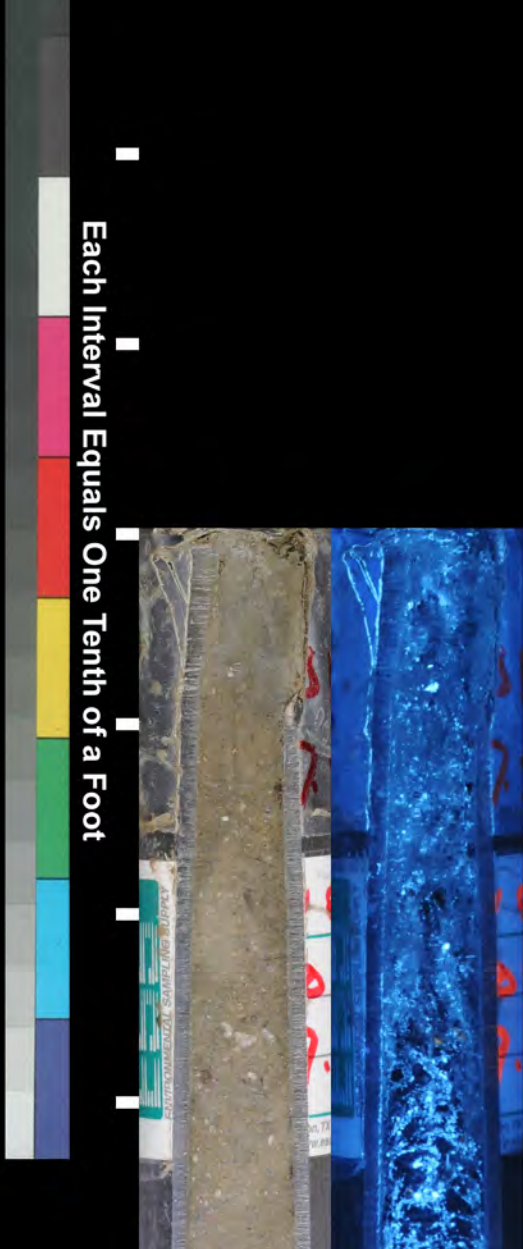
Project: RACER Validation Center Boring ID: MW84-12
Project No.: 17322-T01Y12-04



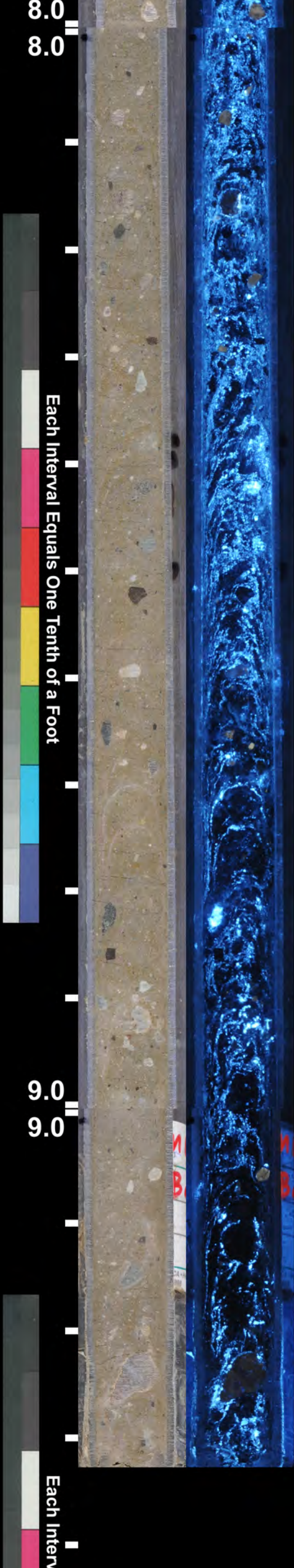
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Project No.: 17322-T01Y12-04



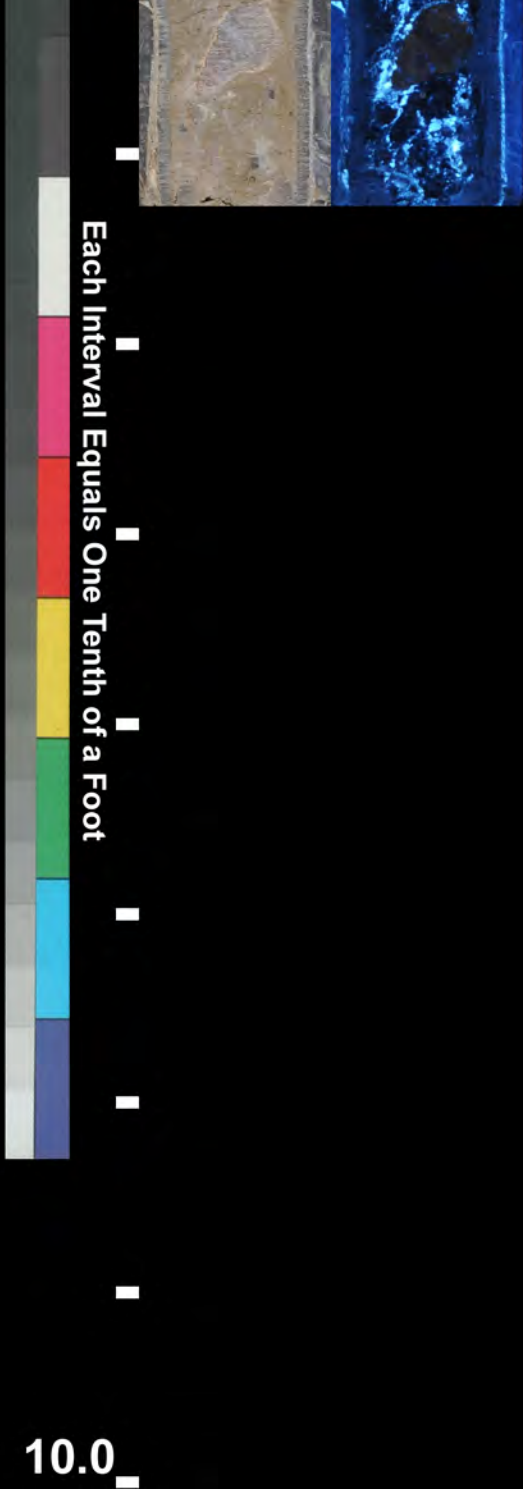
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Project No.: 17322-T01Y12-04



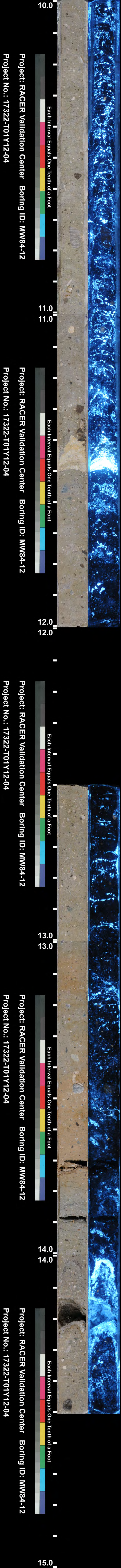
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Project No.: 17322-T01Y12-04

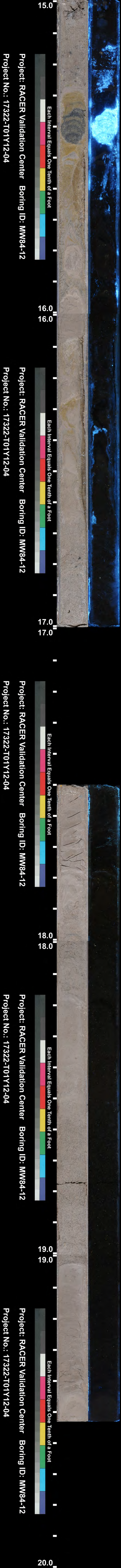


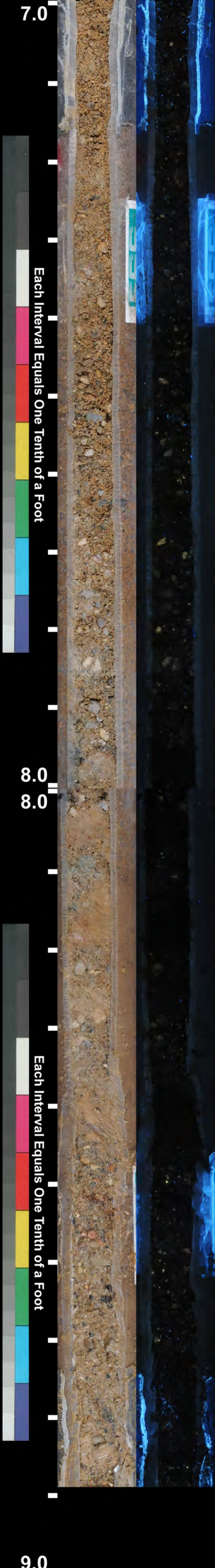
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Project No.: 17322-T01Y12-04



Project: RACER Validation Center Boring ID: MW84-12
Project No.: 17322-T01Y12-04

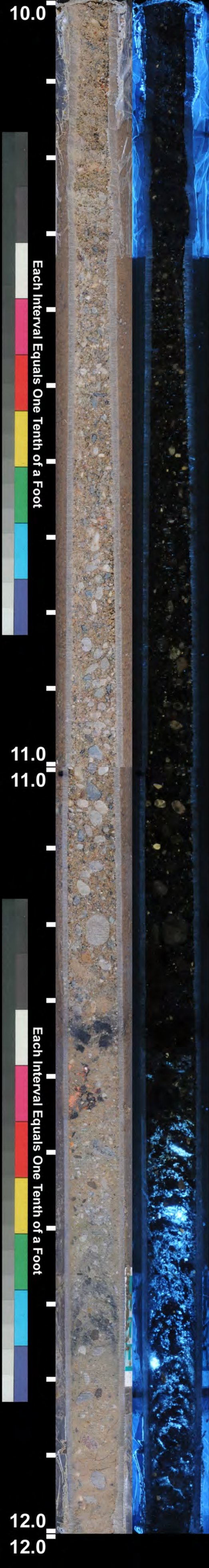




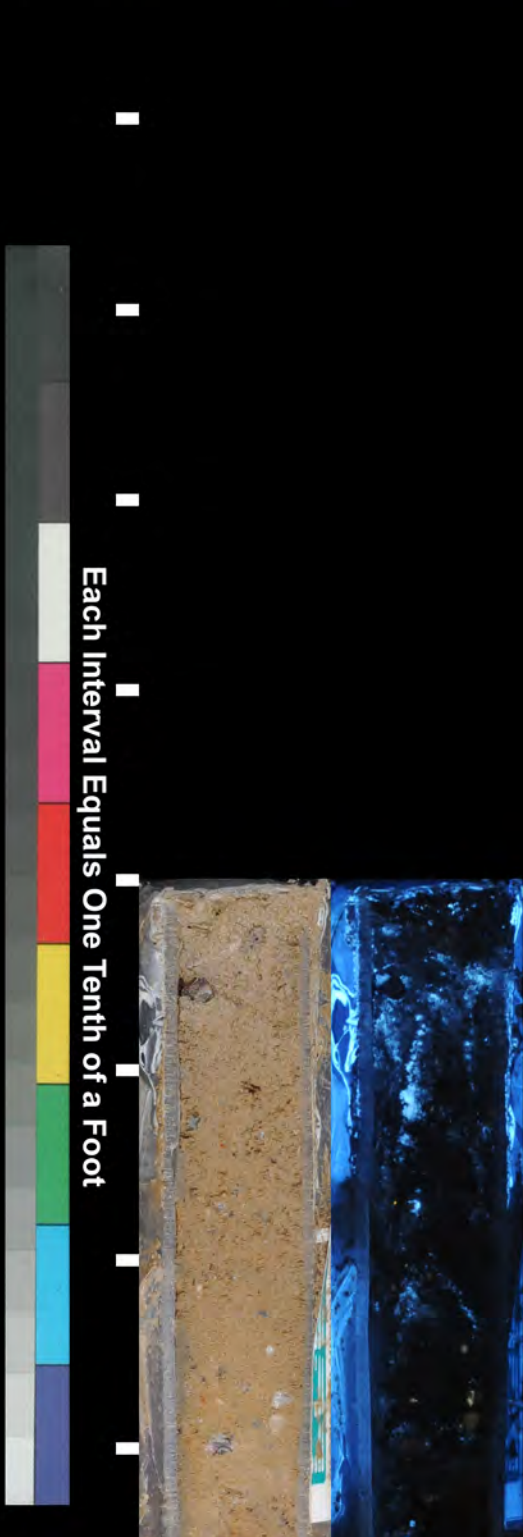


Project: RACER Validation Center Boring ID: MW86-12
Project No.: 17322-T01Y12-04

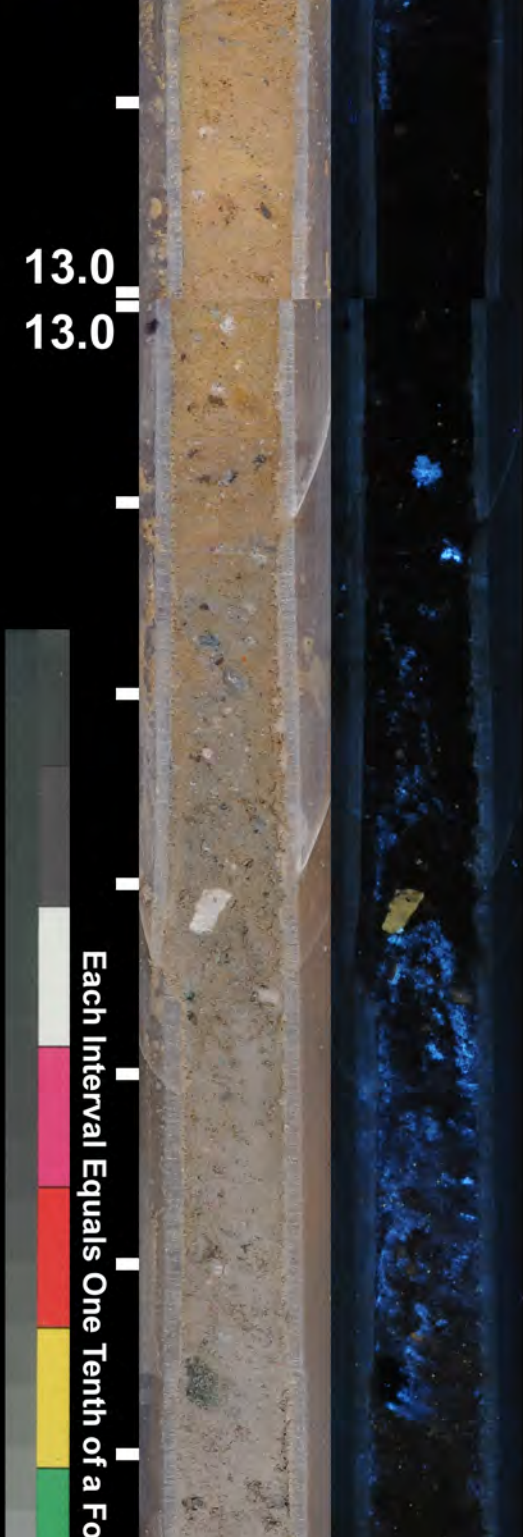
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Project No.: 17322-T01Y12-04



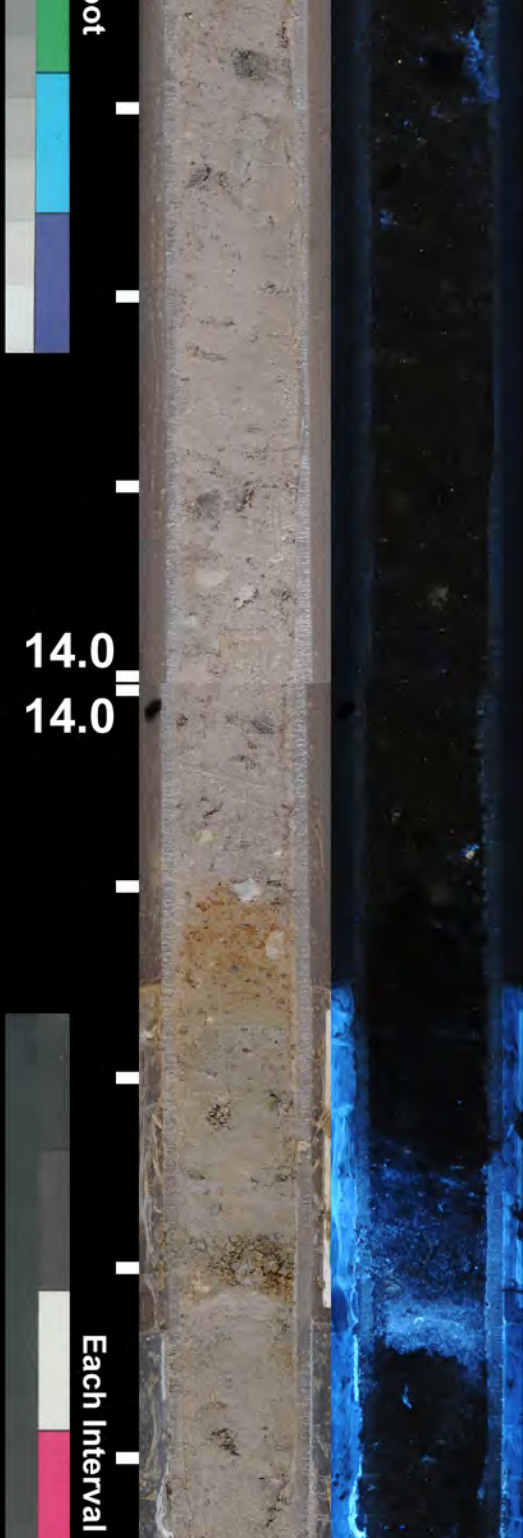
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Project No.: 17322-T01Y12-04



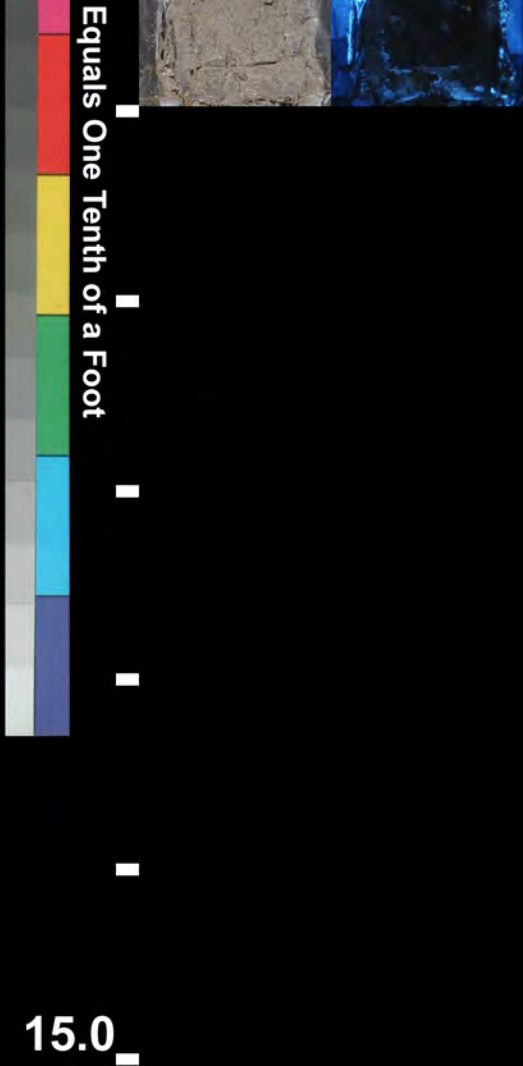
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Project No.: 17322-T01Y12-04



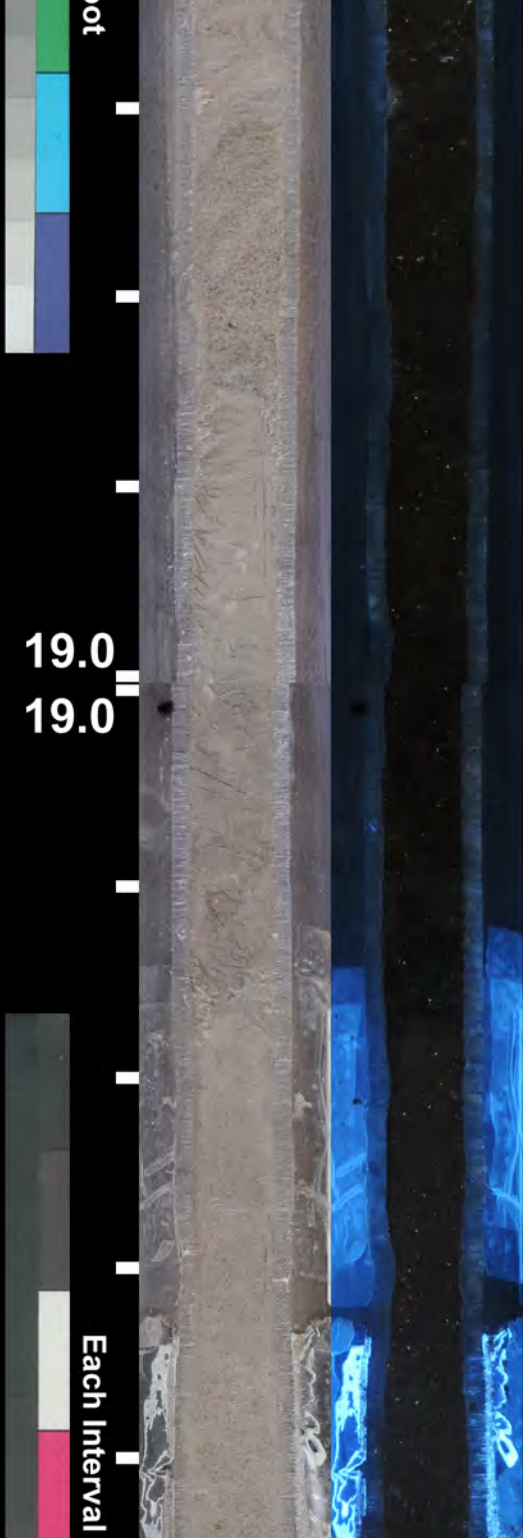
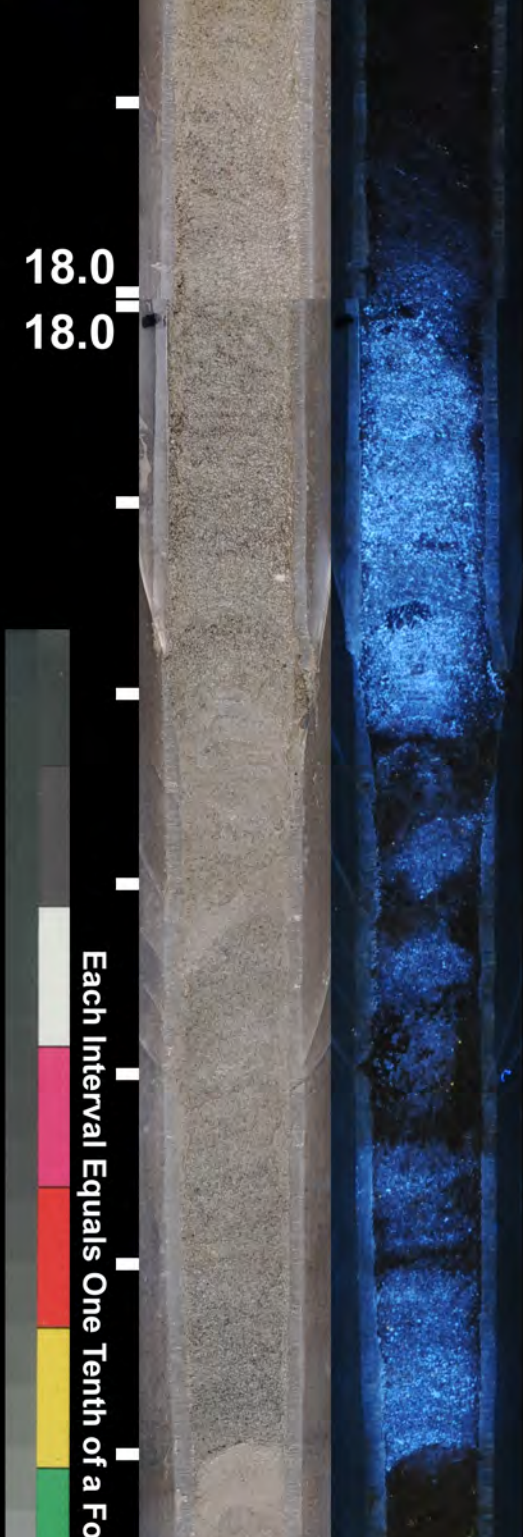
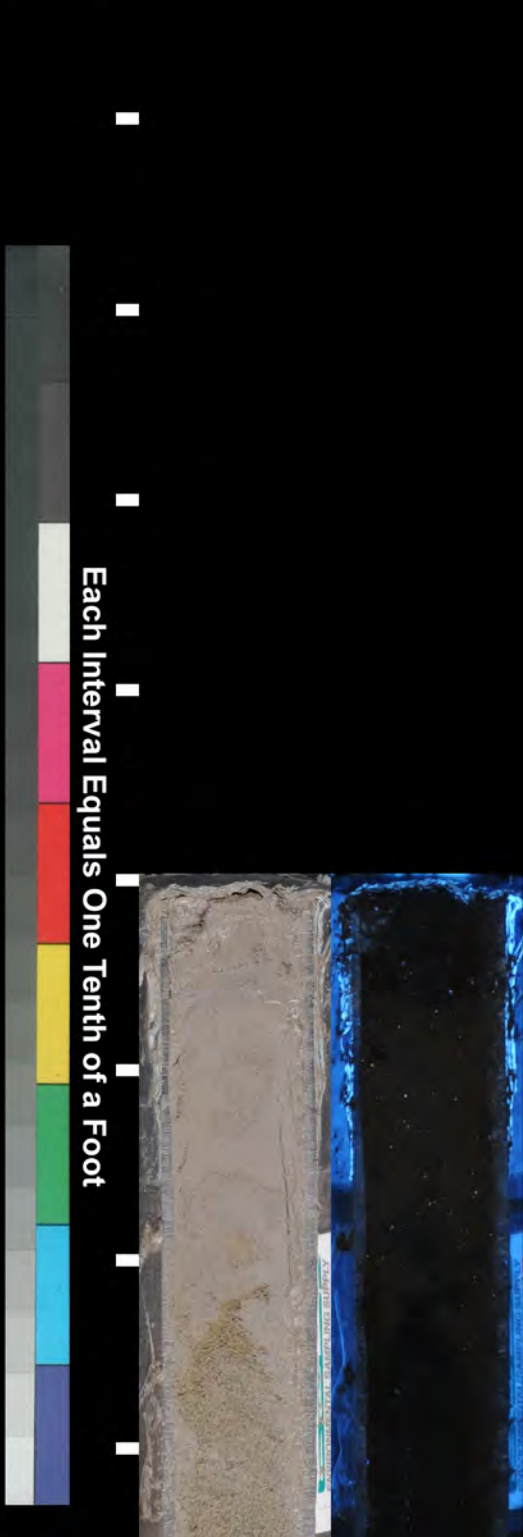
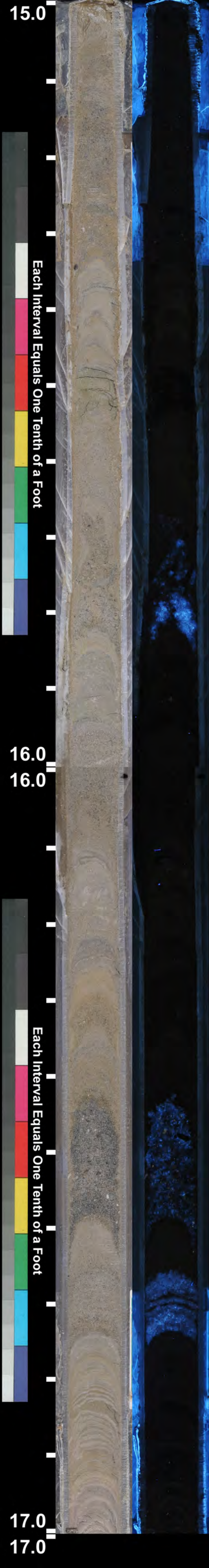
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Project No.: 17322-T01Y12-04



Project: RACER Validation Center Boring ID: MW86-12
Project No.: 17322-T01Y12-04



Project: RACER Validation Center Boring ID: MW86-12
Project No.: 17322-T01Y12-04



ENDPOINT SATURATION WATER DRIVE TEST: INITIAL AND RESIDUAL SATURATIONS

PROJECT NAME: RACER Validation Center
 PROJECT NO: 17322-T01Y12-04

METHODS:			API RP 40		API RP 40	API RP 40, DEAN-STARK			
SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENTATION (1)	DENSITY		TOTAL POROSITY, %Vb	PORE FLUID SATURATIONS, % Pv			
			BULK, g/cc	GRAIN, g/cc		Initial Fluid Saturations		After Waterflood Test	
						WATER (Swi) SATURATION	NAPL (Soi) SATURATION	WATER (Srw) SATURATION	NAPL (Sor) SATURATION
MW86-12	18.1	V	1.61	2.69	40.1	51.3	14.8	63.7	14.8
	NOTE:	No visible LNAPL produced; 14.7 pore volumes of water injected. Produced water clear with moderate hydrocarbon odor.							
MW84-12	11.45	V	1.72	2.74	37.1	54.3	11.5	59.0	11.5
	NOTE:	No visible LNAPL produced; 1.3 pore volumes of water injected. Produced water clear with no hydrocarbon odor. Test discontinued due to low permeability.							
MW84-12	15.4	V	1.49	2.71	45.0	57.5	30.7	58.4	21.5
	NOTE:	Yellow-brown LNAPL produced; 14.4 pore volumes of water injected. Produced water slightly cloudy with faint hydrocarbon odor.							

Water drives conducted at 25 psi confining pressure and 70°F. Laboratory fresh water (tap) used as injection fluid.

N/A = Not Analyzed. Vb = Bulk Volume, Pv = Pore Volume. (1) H = horizontal, V = vertical, R = remold

Soi = Initial NAPL Saturation as received prior to water flooding, Swi = Initial Water Saturation as received prior to waterflooding

Sor = Residual NAPL Saturation after waterflooding, Srw = Residual Water Saturation after waterflooding

Water = 0.9996 g/cc, NAPL = 0.8600 g/cc.

PTS File No: 42611
 Client: Conestoga-Rovers & Associates

PHYSICAL PROPERTIES DATA - PORE FLUID SATURATIONS

PROJECT NAME: RACER Validation Center
 PROJECT NO: 17322-T01Y12-04

SAMPLE ID.	DEPTH, ft.	METHODS: SAMPLE ORIENTATION (1)	API RP 40 / ASTM D2216	API RP 40		API RP 40		API RP 40	
			MOISTURE CONTENT, % weight	DENSITY		POROSITY, %Vb (2)		PORE FLUID SATURATIONS, % Pv (3)	
				BULK, g/cc	GRAIN, g/cc	TOTAL	AIR FILLED	WATER	NAPL
MW86-12	11.6	V	12.6	1.70	2.73	37.7	16.3	53.0	3.9
MW84-12	6.6	V	21.2	1.50	2.71	44.7	12.2	60.0	12.8

(1) Sample Orientation: H = horizontal; V = vertical; R = remold

(2) Total Porosity = all interconnected pore channels; Air Filled = pore channels not occupied by pore fluids

(3) Water = 0.9996 g/cc, Hydrocarbon = 0.8600 g/cc

Vb = Bulk Volume, cc; Pv = Pore Volume, cc; ND = Not Detected

Attachment D

Quantitative Risk Assessment Results (ENVIRON)

December 19, 2008

MEMORANDUM

To: Geraldine Barnuevo, GM

cc: Marilyn Dedyne, GM
Fred Rindhage, GM
Jean Caufield, GM
Laura Fitzpatrick, Esq., GM

From: Francis Ramacciotti
Steve Song

Subject: Soil, Groundwater, and LNAPL Data Evaluation
GM Pontiac Validation Center, Pontiac, Michigan

ENVIRON has performed a data screening and risk evaluation using the existing soil, groundwater, and light non-aqueous phase liquid (LNAPL) data collected at the General Motors (GM) Pontiac Validation Center in Pontiac, Michigan (Site) to identify potentially significant current and future exposures. Potential routine worker, maintenance worker, and construction worker exposures to soil, groundwater, and LNAPL were evaluated based on an understanding that GM intends to use a deed restriction to restrict future land use at the Site to commercial/industrial. The data used in the data screening and risk evaluation included those collected from 1989 through 2008 during various environmental site assessments. While the data collected in 2007 and 2008 are believed to be the most representative of current conditions at the Site, all data were used in screening and risk evaluation.

Methodology

Data screening was performed using Michigan Department of Environmental Quality (MDEQ) Part 201 Generic Screening Levels (MDEQ Operational Memorandum No. 1, Part 201 Cleanup Criteria, January 2006), which are based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

Soil screening criteria used include the following:

1. MDEQ Part 201 industrial and residential direct contact criteria;
2. MDEQ Part 201 industrial and residential soil volatilization to indoor air criteria;
3. MDEQ Part 201 industrial and residential soil inhalation criteria (outdoor air); and,
4. MDEQ Part 201 industrial and residential particulate inhalation criteria.

Groundwater screening criteria used include the following:

1. MDEQ Part 201 industrial and residential drinking water criteria;
2. MDEQ Part 201 industrial and residential groundwater volatilization to indoor air criteria; and
3. MDEQ Part 201 groundwater contact criteria.

The data screening included Part 201 criteria for residential soil and groundwater exposures even though current and reasonably expected future land use is commercial/industrial to assist in identifying locations that should be considered for inclusion in a “due care plan” under Michigan Part 201 (reference).

In addition to the data screening, ENVIRON calculated cumulative cancer risk and non-cancer hazard index (HI) estimates for potential exposure to constituents in soil, groundwater, and LNAPL at the Site for the following exposure scenarios:

- routine worker ingestion, dermal contact, and inhalation of constituents in soil during typical activities that occur outdoors;
- routine worker inhalation of constituents in soil, groundwater, or LNAPL that volatilize and migrate into indoor air assuming a hypothetical commercial/industrial building that has the characteristics that MDEQ assumed in its derivation of the commercial/industrial soil and groundwater volatilization to indoor air criteria;
- maintenance worker and construction worker ingestion, dermal contact, and inhalation of constituents in soil during excavations into the subsurface;
- maintenance worker and construction worker ingestion, dermal contact, and inhalation of constituents in groundwater during excavations that extend into groundwater; and,
- maintenance worker and construction worker dermal contact, and inhalation of constituents in LNAPL during excavations that extend into LNAPL.

Cumulative cancer risk and HI estimates for potential exposures to soil were calculated using the highest concentration of each chemical from any depth at all sample locations across the Site. Cumulative cancer risk and HI estimates for potential exposures to groundwater were calculated using the highest concentration of each chemical in groundwater from all sample locations across the Site during any sampling event. Cumulative cancer risk and HI estimates for potential exposures to LNAPL were calculated using the highest concentration of each chemical in LNAPL from MW69-08, which is the only location where LNAPL was sampled. Because the highest concentration detected in soil, groundwater, and LNAPL were used in the risk calculations, the resulting risk estimates should be considered upper-bound risk estimates, which are more conservative than reasonable maximum exposure (RME) risk estimates. Figure 1 shows the locations where data have been collected at the Site.

Summary of Results

The soil and groundwater data from the Site were compared to the screening criteria discussed above to identify locations that should be considered for inclusion in a “due care plan” under Michigan Part 201 Natural Resources and Environmental Reporting Act 1994 PA 541. The results of the comparison are summarized on Tables 1a and 2a, which show the highest site-

related¹ concentrations of constituents detected in soil and groundwater, and highlight the ratios of the concentration to screening criteria that are higher than 1. The individual soil and groundwater samples and constituents that exceeded the screening criteria are presented on Tables 1b and 2b, respectively.

The upper-bound cumulative cancer risk and HI estimates for potential routine worker contact with outdoor soil are summarized on Table 3a. Table 3a also summarizes the upper-bound risk estimates for potential routine worker exposure via vapor intrusion into a hypothetical commercial/industrial building and potential maintenance worker and construction worker contact with soil. As shown in this table, none of these upper-bound cumulative cancer risk estimates exceeds USEPA's acceptable cumulative cancer risk limit of 10^{-4} for RME risks. However, all of the upper-bound HI estimates exceed USEPA's acceptable HI limit of 1 for RME risks. The upper-bound HI estimates that exceed 1 are due to elevated xylene concentrations in soil (up to 23,000 mg/kg) at former tanks south of Building 17 (as shown on Figure 2). These xylene data were collected in 1989 and 1995 and may not be representative of current concentrations at this area. However, in the absence of more representative data these data indicate a potential for significant exposure via volatilization to indoor air and routine worker, maintenance worker, and construction worker direct contact with soil in this area.

The upper-bound risk estimates for routine worker, maintenance worker, and construction worker direct contact exposures were refined to identify additional areas where potentially significant exposures may exist by removing the historic data collected at the former tanks south of Building 17 and using 95% UCLs in place of the maximum detected concentration for constituents contributing most significantly to the HI estimates. Specifically, the maximum detected concentrations of naphthalene, PCBs (total), manganese, and mercury were replaced with 95% UCLs which were conservatively calculated using maximum detected concentration with the highest concentrations at any depth from the nine locations nearest to the maximum concentration. These high-end estimates of cumulative cancer risk and HI for routine worker, maintenance worker, and construction worker exposure are shown on Table 3b. As shown on Table 3b, the cumulative cancer risk estimates, after incorporating these refinements, meet USEPA's HI limit for RME exposures except for the construction worker HI which slightly exceeds 1. However, the noncancer HI estimates on Table 3b sum the hazard quotient for individual chemicals regardless of the effects of each chemical. Segregating the hazard index by health effect or target organ, which is consistent with USEPA risk assessment methodology, gives HI estimates for construction worker exposure that do not exceed USEPA's HI limit, as shown on Table 3c.

The upper-bound HI estimate for potential routine worker exposure to constituents in soil that could volatilize and migrate into a hypothetical commercial/industrial building were refined by using the vertically averaged concentration of 1,2,4-trimethylbenzene at location MW-33-07 instead of the maximum detected concentration of 1,2,4-trimethylbenzene and are summarized on Table 3b. As shown in this table, the HI estimate for potential routine worker vapor intrusion exposure meets USEPA's acceptable noncancer HI limit of 1 for RME risk.

¹ Manganese concentrations at or below 440 mg/kg were assumed to represent the naturally occurring background concentration of manganese in soil (i.e., not included in site-related risk estimates) per MDEQ Part 201 (January 2006).

The upper-bound cumulative cancer risk and HI estimates for potential routine worker exposure via vapor intrusion and potential maintenance worker and construction worker direct contact exposure to constituents in groundwater are summarized on Table 4. As shown in this table, none of the upper-bound cumulative cancer risk and HI estimates exceeds USEPA's acceptable cumulative cancer risk and noncancer HI limits of 10^{-4} and 1 for RME risks, respectively.

The upper-bound cumulative cancer risk and HI estimates for potential routine worker exposure via vapor intrusion into a hypothetical commercial/industrial building and potential maintenance worker direct contact exposure to constituents in LNAPL are summarized on Table 5. As shown in this table, none of the upper-bound cumulative cancer risk and HI estimates exceeds USEPA's acceptable cumulative cancer risk and noncancer HI limits of 10^{-4} and 1 for RME risks, respectively, except the HI for potential maintenance worker or construction worker contact with LNAPL. The extent of LNAPL around monitoring well MW69-08, the location where LNAPL was sampled, has been delineated and is shown on Figure 3. LNAPL was also identified near monitoring well MW33-07, however, no sample of that LNAPL was collected for chemical analysis because of insufficient sample volume.

Based on the results summarized on Table 3b, Table 4, and Table 5, the soil, groundwater, and LNAPL data used in the evaluation do not indicate a potential for significant worker exposures at the Site, except for xylene concentrations in soil south of Building 17 (Figure 2) and chloromethane concentrations in LNAPL north of Building 17 (Figure 3).

Please contact us if you have questions regarding this evaluation for the GM Pontiac Validation Center Site.

Enclosures

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
Background	INORG	Antimony	7440-36-0		18	18	3.00E-02	1.60E-01						1.3E+04	1.2E-05	1.8E+02	8.9E-04					5.9E+03	2.7E-05	6.7E+02	2.4E-04
Background	INORG	Arsenic	7440-38-2	A	19	19	1.20E+00	6.70E+00						7.2E+02	9.3E-03	7.6E+00	8.8E-01					9.1E+02	7.4E-03	3.7E+01	1.8E-01
Background	INORG	Barium	7440-39-3	NC	19	19	4.70E+00	2.14E+02						3.3E+05	6.5E-04	3.7E+04	5.8E-03					1.5E+05	1.4E-03	1.3E+05	1.6E-03
Background	INORG	Beryllium	7440-41-7	B1	19	17	1.40E-01	4.40E-01						1.3E+03	3.4E-04	4.1E+02	1.1E-03					5.9E+02	7.5E-04	1.6E+03	2.8E-04
Background	INORG	Cadmium	7440-43-9	B1	19	19	6.40E-02	6.20E-01						1.7E+03	3.6E-04	5.5E+02	1.1E-03					2.2E+03	2.8E-04	2.1E+03	3.0E-04
Background	INORG	Chromium III	16065-83-1	D	19	19	4.49E+00	1.52E+01						3.3E+05	4.6E-05	7.9E+05	1.9E-05					1.5E+05	1.0E-04	1.0E+06	1.5E-05
Background	INORG	Cobalt	7440-48-4	LC	19	19	2.40E+00	1.33E+01						1.3E+04	1.0E-03	2.6E+03	5.1E-03					5.9E+03	2.3E-03	9.0E+03	1.5E-03
Background	INORG	Copper	7440-50-8	D	19	19	6.10E+00	1.80E+01						1.3E+05	1.4E-04	2.0E+04	9.0E-04					5.9E+04	3.1E-04	7.3E+04	2.5E-04
Background	INORG	Lead	7439-92-1	B2	19	19	3.50E+00	2.76E+01						1.0E+05	2.8E-04	4.0E+02	6.9E-02					4.4E+04	6.3E-04	9.0E+02	3.1E-02
Background	INORG	Manganese	7439-96-5	D	19	19	5.57E+01	4.11E+03	4.40E+02					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
Background	INORG	Mercury	7439-97-6	D	19	8	1.80E-02	4.80E-02		4.8E+01	1.0E-03	5.2E+01	9.2E-04	2.0E+04	2.4E-06	1.6E+02	3.0E-04	8.9E+01	5.4E-04	6.2E+01	7.7E-04	8.8E+03	5.5E-06	5.8E+02	8.3E-05
Background	INORG	Nickel	7440-02-0	A	19	19	7.50E+00	2.51E+01						1.3E+04	1.9E-03	4.0E+04	6.3E-04					1.6E+04	1.6E-03	1.5E+05	1.7E-04
Background	INORG	Selenium	7782-49-2	D	19	19	1.70E-01	7.60E-01						1.3E+05	5.8E-06	2.6E+03	2.9E-04					5.9E+04	1.3E-05	9.6E+03	7.9E-05
Background	INORG	Silver	7440-22-4	D	19	9	1.90E-02	3.80E-02						6.7E+03	5.7E-06	2.5E+03	1.5E-05					2.9E+03	1.3E-05	9.0E+03	4.2E-06
Background	INORG	Thallium	7440-28-0		19	14	1.30E-01	3.90E-01								3.5E+01	1.1E-02							1.3E+02	3.0E-03
Background	INORG	Vanadium	7440-62-2		19	19	8.10E+00	2.42E+01								7.5E+02	3.2E-02							5.5E+03	4.4E-03
Background	INORG	Zinc	7440-66-6	ID	19	19	1.87E+01	5.79E+01								1.7E+05	3.4E-04							6.3E+05	9.2E-05
PAOC01	VOC	Acetone	67-64-1	ID	11	4	5.80E-03	4.30E-02		1.1E+05	3.9E-07	1.3E+05	3.3E-07	3.9E+08	1.1E-10	2.3E+04	1.9E-06	1.1E+05	3.9E-07	1.6E+05	2.7E-07	1.7E+08	2.5E-10	7.3E+04	5.9E-07
PAOC01	VOC	Benzene	71-43-2	A	11	2	2.30E-04	2.40E-04		1.6E+00	1.5E-04	1.3E+01	1.8E-05	3.8E+05	6.3E-10	1.8E+02	1.3E-06	8.4E+00	2.9E-05	4.5E+01	5.3E-06	4.7E+05	5.1E-10	4.0E+02	6.0E-07
PAOC01	VOC	2-Butanone	78-93-3	ID	11	4	1.30E-03	8.80E-03		2.7E+04	3.3E-07	2.9E+04	3.0E-07	6.7E+07	1.3E-10	2.7E+04	3.3E-07	2.7E+04	3.3E-07	3.5E+04	2.5E-07	2.9E+07	3.0E-10	2.7E+04	3.3E-07
PAOC01	VOC	Carbon Disulfide	75-15-0		11	1	1.00E-03	1.00E-03		7.6E+01	1.3E-05	1.3E+03	7.7E-07	4.7E+07	2.1E-11	2.8E+02	3.6E-06	1.4E+02	7.1E-06	1.6E+03	6.3E-07	2.1E+07	4.8E-11	2.8E+02	3.6E-06
PAOC01	VOC	1,2-Dichlorobenzene	95-50-1	D	11	1	3.40E-04	3.40E-04		2.1E+02	1.6E-06	3.9E+04	8.7E-09	1.0E+08	3.4E-12	2.1E+02	1.6E-06	2.1E+02	1.6E-06	4.6E+04	7.4E-09	4.4E+07	7.7E-12	2.1E+02	1.6E-06
PAOC01	VOC	1,3-Dichlorobenzene	541-73-1	D	11	1	3.20E-04	3.20E-04								1.7E+02	1.9E-06							1.7E+02	1.9E-06
PAOC01	VOC	Ethyl Benzene	100-41-4	D	11	1	2.60E-04	2.60E-04		8.7E+01	3.0E-06	7.2E+02	3.6E-07	1.0E+07	2.6E-11	1.4E+02	1.9E-06	1.4E+02	1.9E-06	2.4E+03	1.1E-07	1.3E+07	2.0E-11	1.4E+02	1.9E-06
PAOC01	VOC	Methylene Chloride	75-09-2	B2	11	1	1.20E-03	1.20E-03		4.5E+01	2.7E-05	2.1E+02	5.7E-06	6.6E+06	1.8E-10	1.3E+03	9.2E-07	2.4E+02	5.0E-06	7.0E+02	1.7E-06	8.3E+06	1.4E-10	2.3E+03	5.2E-07
PAOC01	VOC	Toluene	108-88-3	ID	11	3	2.10E-04	5.60E-04		2.5E+02	2.2E-06	2.8E+03	2.0E-07	2.7E+07	2.1E-11	2.5E+02	2.2E-06	2.5E+02	2.2E-06	3.3E+03	1.7E-07	1.2E+07	4.7E-11	2.5E+02	2.2E-06
PAOC01	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	11	1	2.50E-03	2.50E-03		1.1E+02	2.3E-05	2.1E+04	1.2E-07	8.2E+07	3.0E-11	1.1E+02	2.3E-05	1.1E+02	2.3E-05	2.5E+04	1.0E-07	3.6E+07	6.9E-11	1.1E+02	2.3E-05
PAOC01	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	11	1	2.20E-03	2.20E-03		9.4E+01	2.3E-05	1.6E+04	1.4E-07	8.2E+07	2.7E-11	9.4E+01	2.3E-05	9.4E+01	2.3E-05	1.9E+04	1.2E-07	3.6E+07	6.1E-11	9.4E+01	2.3E-05
PAOC01	VOC	Xylenes (total)	1330-20-7	ID	11	2	8.70E-04	3.10E-03		1.5E+02	2.1E-05	4.6E+04	6.7E-08	2.9E+08	1.1E-11	1.5E+02	2.1E-05	1.5E+02	2.1E-05	5.4E+04	5.7E-08	1.3E+08	2.4E-11	1.5E+02	2.1E-05
PAOC01	SVOC	Acenaphthene	83-32-9		11	2	7.90E-03	5.10E-02		1.9E+05	2.7E-07	8.1E+04	6.3E-07	1.4E+07	3.6E-09	4.1E+04	1.2E-06	3.5E+05	1.5E-07	9.7E+04	5.3E-07	6.2E+06	8.2E-09	1.3E+05	3.9E-07
PAOC01	SVOC	Acenaphthylene	208-96-8	D	11	1	2.60E-02	2.60E-02		1.6E+03	1.6E-05	2.2E+03	1.2E-05	2.3E+06	1.1E-08	1.6E+03	1.6E-05	3.0E+03	8.7E-06	2.7E+03	9.6E-06	1.0E+06	2.6E-08	5.2E+03	5.0E-06
PAOC01	SVOC	Anthracene	120-12-7	D	11	3	1.40E-02	3.50E-01		1.0E+06	3.5E-07	1.4E+06	2.5E-07	6.7E+07	5.2E-09	2.3E+05	1.5E-06	1.0E+06	3.5E-07	1.6E+06	2.2E-07	2.9E+07	1.2E-08	7.3E+05	4.8E-07
PAOC01	SVOC	Benzo(a)anthracene	56-55-3	B2	11	6	1.50E-02	8.50E-01								2.0E+01	4.3E-02							8.0E+01	1.1E-02
PAOC01	SVOC	Benzo(a)pyrene	50-32-8	B2	11	4	1.70E-02	3.60E-01						1.5E+03	2.4E-04	2.0E+00	1.8E-01					1.9E+03	1.9E-04	8.0E+00	4.5E-02
PAOC01	SVOC	Benzo(b)fluoranthene	205-99-2	B2	11	5	2.00E-02	3.20E-01								2.0E+01	1.6E-02							8.0E+01	4.0E-03
PAOC01	SVOC	Benzo(g,h,i)perylene	191-24-2	D	11	5	8.80E-03	1.90E-01						8.0E+05	2.4E-07	2.5E+03	7.6E-05					3.5E+05	5.4E-07	7.0E+03	2.7E-05
PAOC01	SVOC	Benzo(k)fluoranthene	207-08-9	B2	11	5	8.30E-03	3.40E-01								2.0E+02	1.7E-03							8.0E+02	4.3E-04
PAOC01	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	11	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC01	SVOC	Carbazole	86-74-8	B2	11	1	5.80E-02	5.80E-02								5.3E+02	1.1E-04							2.4E+03	2.4E-05
PAOC01	SVOC	Chrysene	218-01-9	B2	11	6	2.00E-02	9.50E-01								2.0E+03	4.8E-04							8.0E+03	1.2E-04
PAOC01	SVOC	Dibenzofuran	132-64-9	D	11	1	4.20E-02	4.20E-02																	
PAOC01	SVOC	Fluoranthene	206-44-0	D	11	6	2.70E-02	1.80E+00		1.0E+06	1.8E-06	7.4E+05	2.4E-06	9.3E+06	1.9E-07	4.6E+04	3.9E-05	1.0E+06	1.8E-06	8.9E+05	2.0E-06	4.1E+06	4.4E-07	1.3E+05	1.4E-05
PAOC01	SVOC	Fluorene	86-73-7	D	11	1	6.20E-02	6.20E-02		5.8E+05	1.1E-07	1.3E+05	4.8E-07	9.3E+06	6.7E-09	2.7E+04	2.3E-06	1.0E+06	6.2E-08	1.5E+05	4.1E-07	4.1E+06	1.5E-08	8.7E+04	7.1E-07
PAOC01	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	11	4	9.30E-03	1.80E-01								2.0E+01	9.0E-03							8.0E+01	2.3E-03
PAOC01	SVOC	2-Methylnaphthalene	91-57-6	ID	11	3	9.70E-03	3.10E-02								8.1E+03	3.8E-06							2.6E+04	1.2E-06
PAOC01	SVOC	Naphthalene	91-20-3	C	11	3	8.90E-03	3.00E-02		2.5E+02	1.2E-04	3.0E+02	1.0E-04	2.0E+05	1.5E-07	1.6E+04	1.9E-06	4.7E+02	6.4E-05	3.5E+02	8.6E-05	8.8E+04	3.4E-07	5.2E+04	5.8E-07
PAOC01	SVOC	Phenanthrene	85-01-8	D	11	7	1.40E-02	1.50E+00		2.8E+03	5.4E-04	1.6E+02	9.4E-03	6.7E+03	2.2E-04	1.6E+03	9.4E-04	5.1E+03	2.9E-04	1.9E+02	7.9E-03	2.9E+03	5.2E-04	5.2E+03	2.9E-04
PAOC01	SVOC	Pyrene	129-00-0	NC	11	7	2.50E-02	1.70E+00		1.0E+06	1.7E-06	6.5E+05	2.6E-06	6.7E+06	2.5E-07	2.9E+04	5.9E-05	1.0E+06	1.7E-06	7.8E+05	2.2E-06	2.9E+06	5.9E-07	8.4E+04	2.0E-05
PAOC01	PCB	PCBs (total)	1336-36-3	B2	11	1	4.00E-02	4.00E-02		3.0E+03	1.3E-05	2.4E+02	1.7E-04	5.2E+03	7.7E-06	4.0E+00	1.0E-02	1.6E+04	2.5E-06	8.1E+02	4.9E-05	6.5E+03	6.2E-06	1.6E+01	2.5E-03
PAOC01	INORG	Antimony	7440-36-0		11	2	9.50E-02	1.20E-01						1.3E+04	9.2E-06	1.8E+02	6.7E-04					5.9E+03	2.0E-0		

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																											
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial DCC (mg/kg)	Ratio of Max Detect to Industrial DCC		
PAOC02	VOC	1,4-Dichlorobenzene	106-46-7	C	38	1	4.70E-04	4.70E-04		1.9E+01	2.5E-05	7.7E+01	6.1E-06	4.5E+05	1.0E-09	4.0E+02	1.2E-06	1.0E+02	4.7E-06	2.6E+02	1.8E-06	5.7E+05	8.2E-10	1.9E+03	2.5E-07		
PAOC02	VOC	1,1-Dichloroethane	75-34-3	SC	41	2	1.80E-02	7.40E-02		2.3E+02	3.2E-04	2.1E+03	3.5E-05	3.3E+07	2.2E-09	8.9E+02	8.3E-05	4.3E+02	1.7E-04	2.5E+03	3.0E-05	1.5E+07	4.9E-09	8.9E+02	8.3E-05		
PAOC02	VOC	1,1-Dichloroethene	75-35-4	C	41	4	1.80E-03	2.60E-01		6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04		
PAOC02	VOC	cis-1,2-Dichloroethene	156-59-2	ID	41	1	8.80E-04	8.80E-04		2.2E+01	4.0E-05	1.8E+02	4.9E-06	2.3E+06	3.8E-10	6.4E+02	1.4E-06	4.1E+01	2.1E-05	2.1E+02	4.2E-06	1.0E+06	8.8E-10	6.4E+02	1.4E-06		
PAOC02	VOC	Ethyl Benzene	100-41-4	D	41	2	2.10E-02	2.50E-02		8.7E+01	2.9E-04	7.2E+02	3.5E-05	1.0E+07	2.5E-09	1.4E+02	1.8E-04	1.4E+02	1.8E-04	2.4E+03	1.0E-05	1.3E+07	1.9E-09	1.4E+02	1.8E-04		
PAOC02	VOC	4-Methyl-2-pentanone	108-10-1	ID	41	1	8.90E-04	8.90E-04		2.7E+03	3.3E-07	4.5E+04	2.0E-08	1.4E+08	6.4E-12	2.7E+03	3.3E-07	2.7E+03	3.3E-07	5.3E+04	1.7E-08	6.0E+07	1.5E-11	2.7E+03	3.3E-07		
PAOC02	VOC	Methylcyclohexane	108-87-2		26	3	1.70E-03	3.20E-01																			
PAOC02	VOC	Tetrachloroethene	127-18-4	C-B2	41	3	2.10E-03	7.40E-02		1.1E+01	6.7E-03	1.8E+02	4.1E-04	5.4E+06	1.4E-08	8.8E+01	8.4E-04	6.0E+01	1.2E-03	6.0E+02	1.2E-04	6.8E+06	1.1E-08	8.8E+01	8.4E-04		
PAOC02	VOC	Toluene	108-88-3	ID	41	4	3.60E-04	1.00E-03		2.5E+02	4.0E-06	2.8E+03	3.6E-07	2.7E+07	3.7E-11	2.5E+02	4.0E-06	2.5E+02	4.0E-06	3.3E+03	3.0E-07	1.2E+07	8.3E-11	2.5E+02	4.0E-06		
PAOC02	VOC	1,1,1-Trichloroethane	71-55-6	ID	41	2	4.00E-01	1.30E+00		2.5E+02	5.2E-03	3.8E+03	3.4E-04	6.7E+07	1.9E-08	4.6E+02	2.8E-03	4.6E+02	2.8E-03	4.5E+03	2.9E-04	2.9E+07	4.5E-08	4.6E+02	2.8E-03		
PAOC02	VOC	Trichloroethene	79-01-6	C-B2	41	7	2.70E-03	7.60E+00		7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02		
PAOC02	VOC	Trichlorofluoromethane	75-69-4		26	1	1.20E-03	1.20E-03		5.6E+02	2.1E-06	9.2E+04	1.3E-08	3.8E+09	3.2E-13	5.6E+02	2.1E-06	5.6E+02	2.1E-06	1.1E+05	1.1E-08	1.7E+09	7.1E-13	5.6E+02	2.1E-06		
PAOC02	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	25	1	4.60E-01	4.60E-01		1.1E+02	4.2E-03	2.1E+04	2.2E-05	8.2E+07	5.6E-09	1.1E+02	4.2E-03	1.1E+02	4.2E-03	2.5E+04	1.8E-05	3.6E+07	1.3E-08	1.1E+02	4.2E-03		
PAOC02	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	25	1	2.30E-01	2.30E-01		9.4E+01	2.4E-03	1.6E+04	1.4E-05	8.2E+07	2.8E-09	9.4E+01	2.4E-03	9.4E+01	2.4E-03	1.9E+04	1.2E-05	3.6E+07	6.4E-09	9.4E+01	2.4E-03		
PAOC02	VOC	Xylenes (total)	1330-20-7	ID	40	3	6.30E-04	9.20E-02		1.5E+02	6.1E-04	4.6E+04	2.0E-06	2.9E+08	3.2E-10	1.5E+02	6.1E-04	1.5E+02	6.1E-04	5.4E+04	1.7E-06	1.3E+08	7.1E-10	1.5E+02	6.1E-04		
PAOC02	SVOC	Acenaphthene	83-32-9		37	1	1.70E-02	1.70E-02		1.9E+05	8.9E-08	8.1E+04	2.1E-07	1.4E+07	1.2E-09	4.1E+04	4.1E-07	3.5E+05	4.9E-08	9.7E+04	1.8E-07	6.2E+06	2.7E-09	1.3E+05	1.3E-07		
PAOC02	SVOC	Acenaphthylene	208-96-8	D	37	1	2.90E-02	2.90E-02		1.6E+03	1.8E-05	2.2E+03	1.3E-05	2.3E+06	1.3E-08	1.6E+03	1.8E-05	3.0E+03	9.7E-06	2.7E+03	1.1E-05	1.0E+06	2.9E-08	5.2E+03	5.6E-06		
PAOC02	SVOC	Anthracene	120-12-7	D	37	4	8.20E-03	5.00E-02		1.0E+06	5.0E-08	1.4E+06	3.6E-08	6.7E+07	7.5E-10	2.3E+05	2.2E-07	1.0E+06	5.0E-08	1.6E+06	3.1E-08	2.9E+07	1.7E-09	7.3E+05	6.8E-08		
PAOC02	SVOC	Benzo(a)anthracene	56-55-3	B2	37	5	8.80E-03	1.80E-01								2.0E+01	9.0E-03							8.0E+01	2.3E-03		
PAOC02	SVOC	Benzo(a)pyrene	50-32-8	B2	37	5	8.10E-03	1.80E-01						1.5E+03	1.2E-04	2.0E+00	9.0E-02					1.9E+03	9.5E-05	8.0E+00	2.3E-02		
PAOC02	SVOC	Benzo(b)fluoranthene	205-99-2	B2	25	5	8.60E-03	2.60E-01								2.0E+01	1.3E-02							8.0E+01	3.3E-03		
PAOC02	SVOC	Benzo(b,k)fluoranthene	U-452		12	1	3.40E-01	3.40E-01																			
PAOC02	SVOC	Benzo(g,h,i)perylene	191-24-2	D	37	5	8.80E-03	1.70E-01						8.0E+05	2.1E-07	2.5E+03	6.8E-05					3.5E+05	4.9E-07	7.0E+03	2.4E-05		
PAOC02	SVOC	Benzo(k)fluoranthene	207-08-9	B2	25	4	3.00E-02	1.00E-01								2.0E+02	5.0E-04							8.0E+02	1.3E-04		
PAOC02	SVOC	Biphenyl	92-52-4	D	25	1	2.00E-01	2.00E-01																			
PAOC02	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	37	15	2.00E-02	3.60E-01						7.0E+05	5.1E-07	2.8E+03	1.3E-04							8.9E+05	4.0E-07	1.0E+04	3.6E-05
PAOC02	SVOC	Caprolactam	105-60-2		25	1	2.20E-01	2.20E-01						6.7E+05	3.3E-07	5.3E+04	4.2E-06							2.9E+05	7.6E-07	3.1E+05	7.1E-07
PAOC02	SVOC	Carbazole	86-74-8	B2	25	1	2.70E-02	2.70E-02								5.3E+02	5.1E-05							2.4E+03	1.1E-05		
PAOC02	SVOC	Chrysene	218-01-9	B2	37	9	8.30E-03	2.30E-01								2.0E+03	1.2E-04							8.0E+03	2.9E-05		
PAOC02	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	37	4	9.90E-03	3.80E-02								2.0E+00	1.9E-02							8.0E+00	4.8E-03		
PAOC02	SVOC	Dibenzofuran	132-64-9	D	37	1	3.40E-02	3.40E-02																			
PAOC02	SVOC	Fluoranthene	206-44-0	D	37	9	9.80E-03	6.10E-01		1.0E+06	6.1E-07	7.4E+05	8.2E-07	9.3E+06	6.6E-08	4.6E+04	1.3E-05	1.0E+06	6.1E-07	8.9E+05	6.9E-07	4.1E+06	1.5E-07	1.3E+05	4.7E-06		
PAOC02	SVOC	Fluorene	86-73-7	D	37	2	2.30E-02	6.80E-02		5.8E+05	1.2E-07	1.3E+05	5.2E-07	9.3E+06	7.3E-09	2.7E+04	2.5E-06	1.0E+06	6.8E-08	1.5E+05	4.5E-07	4.1E+06	1.7E-08	8.7E+04	7.8E-07		
PAOC02	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	37	4	3.70E-02	1.20E-01								2.0E+01	6.0E-03							8.0E+01	1.5E-03		
PAOC02	SVOC	2-Methylnaphthalene	91-57-6	ID	37	4	1.10E-01	3.10E+00								8.1E+03	3.8E-04							2.6E+04	1.2E-04		
PAOC02	SVOC	Naphthalene	91-20-3	C	37	1	7.60E-02	7.60E-02		2.5E+02	3.0E-04	3.0E+02	2.5E-04	2.0E+05	3.8E-07	1.6E+04	4.8E-06	4.7E+02	1.6E-04	3.5E+02	2.2E-04	8.8E+04	8.6E-07	5.2E+04	1.5E-06		
PAOC02	SVOC	Phenanthrene	85-01-8	D	37	9	1.00E-02	2.40E-01		2.8E+03	8.6E-05	1.6E+02	1.5E-03	6.7E+03	3.6E-05	1.6E+03	1.5E-04	5.1E+03	4.7E-05	1.9E+02	1.3E-03	2.9E+03	8.3E-05	5.2E+03	4.6E-05		
PAOC02	SVOC	Pyrene	129-00-0	NC	37	9	7.70E-03	3.30E-01		1.0E+06	3.3E-07	6.5E+05	5.1E-07	6.7E+06	4.9E-08	2.9E+04	1.1E-05	1.0E+06	3.3E-07	7.8E+05	4.2E-07	2.9E+06	1.1E-07	8.4E+04	3.9E-06		
PAOC02	PCB	PCBs (total)	1336-36-3	B2	37	1	4.25E-02	4.25E-02		3.0E+03	1.4E-05	2.4E+02	1.8E-04	5.2E+03	8.2E-06	4.0E+00	1.1E-02	1.6E+04	2.7E-06	8.1E+02	5.2E-05	6.5E+03	6.5E-06	1.6E+01	2.7E-03		
PAOC02	INORG	Antimony	7440-36-0		51	25	4.20E-02	3.20E+00						1.3E+04	2.5E-04	1.8E+02	1.8E-02					5.9E+03	5.4E-04	6.7E+02	4.8E-03		
PAOC02	INORG	Arsenic	7440-38-2	A	52	52	2.00E+00	1.20E+01						7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.2E-01		
PAOC02	INORG	Barium	7440-39-3	NC	52	52	6.40E+00	1.98E+02						3.3E+05	6.0E-04	3.7E+04	5.4E-03					1.5E+05	1.3E-03	1.3E+05	1.5E-03		
PAOC02	INORG	Beryllium	7440-41-7	B1	52	17	9.10E-02	1.80E+00						1.3E+03	1.4E-03	4.1E+02	4.4E-03					5.9E+02	3.1E-03	1.6E+03	1.1E-03		
PAOC02	INORG	Cadmium	7440-43-9	B1	52	45	6.60E-02	2.90E+00						1.7E+03	1.7E-03	5.5E+02	5.3E-03					2.2E+03	1.3E-03	2.1E+03	1.4E-03		
PAOC02	INORG	Chromium (total)	7440-47-3		27	27	4.80E+00	1.90E+01						2.6E+02	7.3E-02	2.5E+03	7.6E-03					2.4E+02	7.9E-02	9.2E+03	2.1E-03		
PAOC02	INORG	Chromium III	16065-83-1	D	25	25	4.27E+00	1.85E+01						3.3E+05	5.6E-05	7.9E+05	2.3E-05					1.5E+05	1.2E-04	1.0E+06	1.8E-05		
PAOC02	INORG	Chromium VI	18540-29-9	A	25	10	4.70E-01	4.10E+00						2.6E+02	1.6E-02	2.5E+03	1.6E-03					2.4E+02	1.7E-02	9.2E+03	4.5E-04		
PAOC02	INORG	Cobalt	7440-48-4	LC	52	42	2.20E+00	1.90E+01						1.3E+04	1.5E-03	2.6E+03	7.3E-03					5.9E+03	3.2E-03	9.0E+03	2.1E-03		
PAOC02	INORG	Copper	7440-50-8	D	52	52	4.00E+00	8.00E+01						1.3E+05	6.2E-04	2.0E+04	4.0E-03					5.9E+04	1.4E-03	7.3E+04	1.1E-03		
PAOC02	INORG	Cyanide (total)	57-12-5	D	40	4	2.10E-01	1.20E+00																			

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC03	SVOC	Phenanthrene	85-01-8	D	9	5	1.10E-02	7.20E-02		2.8E+03	2.6E-05	1.6E+02	4.5E-04	6.7E+03	1.1E-05	1.6E+03	4.5E-05	5.1E+03	1.4E-05	1.9E+02	3.8E-04	2.9E+03	2.5E-05	5.2E+03	1.4E-05
PAOC03	SVOC	Pyrene	129-00-0	NC	9	6	2.00E-02	2.00E-01		1.0E+06	2.0E-07	6.5E+05	3.1E-07	6.7E+06	3.0E-08	2.9E+04	6.9E-06	1.0E+06	2.0E-07	7.8E+05	2.6E-07	2.9E+06	6.9E-08	8.4E+04	2.4E-06
PAOC03	PCB	PCBs (total)	1336-36-3	B2	9	2	3.05E-02	9.34E-01		3.0E+03	3.1E-04	2.4E+02	3.9E-03	5.2E+03	1.8E-04	4.0E+00	2.3E-01	1.6E+04	5.8E-05	8.1E+02	1.2E-03	6.5E+03	1.4E-04	1.6E+01	5.8E-02
PAOC03	INORG	Antimony	7440-36-0		9	4	1.10E-01	1.60E-01						1.3E+04	1.2E-05	1.8E+02	8.9E-04					5.9E+03	2.7E-05	6.7E+02	2.4E-04
PAOC03	INORG	Arsenic	7440-38-2	A	9	9	3.10E+00	5.80E+00						7.2E+02	8.1E-03	7.6E+00	7.6E-01					9.1E+02	6.4E-03	3.7E+01	1.6E-01
PAOC03	INORG	Barium	7440-39-3	NC	9	9	1.13E+01	6.35E+01						3.3E+05	1.9E-04	3.7E+04	1.7E-03					1.5E+05	4.2E-04	1.3E+05	4.9E-04
PAOC03	INORG	Beryllium	7440-41-7	B1	9	6	6.90E-02	5.60E-01						1.3E+03	4.3E-04	4.1E+02	1.4E-03					5.9E+02	9.5E-04	1.6E+03	3.5E-04
PAOC03	INORG	Cadmium	7440-43-9	B1	9	6	7.40E-02	3.10E-01						1.7E+03	1.8E-04	5.5E+02	5.6E-04					2.2E+03	1.4E-04	2.1E+03	1.5E-04
PAOC03	INORG	Chromium III	16065-83-1	D	9	9	4.49E+00	2.77E+01						3.3E+05	8.4E-05	7.9E+05	3.5E-05					1.5E+05	1.8E-04	1.0E+06	2.8E-05
PAOC03	INORG	Chromium VI	18540-29-9	A	9	6	7.20E-01	2.30E+00						2.6E+02	8.8E-03	2.5E+03	9.2E-04					2.4E+02	9.6E-03	9.2E+03	2.5E-04
PAOC03	INORG	Cobalt	7440-48-4	LC	9	9	2.00E+00	9.30E+00						1.3E+04	7.2E-04	2.6E+03	3.6E-03					5.9E+03	1.6E-03	9.0E+03	1.0E-03
PAOC03	INORG	Copper	7440-50-8	D	9	9	7.00E+00	2.56E+01						1.3E+05	2.0E-04	2.0E+04	1.3E-03					5.9E+04	4.3E-04	7.3E+04	3.5E-04
PAOC03	INORG	Cyanide (total)	57-12-5	D	9	2	1.30E-01	4.40E-01						2.5E+02	1.8E-03	1.2E+01	3.7E-02					2.5E+02	1.8E-03	2.5E+02	1.8E-03
PAOC03	INORG	Lead	7439-92-1	B2	9	9	8.80E+00	1.88E+01						1.0E+05	1.9E-04	4.0E+02	4.7E-02					4.4E+04	4.3E-04	9.0E+02	2.1E-02
PAOC03	INORG	Manganese	7439-96-5	D	9	9	2.21E+02	4.84E+02	4.40E+02					3.3E+03	1.3E-02	2.5E+04	1.8E-03					1.5E+03	2.9E-02	9.0E+04	4.9E-04
PAOC03	INORG	Mercury	7439-97-6	D	9	9	1.70E-02	5.00E-02		4.8E+01	1.0E-03	5.2E+01	9.6E-04	2.0E+04	2.5E-06	1.6E+02	3.1E-04	8.9E+01	5.6E-04	6.2E+01	8.1E-04	8.8E+03	5.7E-06	5.8E+02	8.6E-05
PAOC03	INORG	Nickel	7440-02-0	A	9	9	5.90E+00	3.28E+01						1.3E+04	2.5E-03	4.0E+04	8.2E-04					1.6E+04	2.1E-03	1.5E+05	2.2E-04
PAOC03	INORG	Selenium	7782-49-2	D	9	3	1.10E-01	2.70E-01						1.3E+05	2.1E-06	2.6E+03	1.0E-04					5.9E+04	4.6E-06	9.6E+03	2.8E-05
PAOC03	INORG	Silver	7440-22-4	D	9	7	5.90E-02	1.20E-01						6.7E+03	1.8E-05	2.5E+03	4.8E-05					2.9E+03	4.1E-05	9.0E+03	1.3E-05
PAOC03	INORG	Thallium	7440-28-0		9	9	1.00E-01	2.00E-01								3.5E+01	5.7E-03							1.3E+02	1.5E-03
PAOC03	INORG	Vanadium	7440-62-2		9	9	7.40E+00	2.78E+01								7.5E+02	3.7E-02							5.5E+03	5.1E-03
PAOC03	INORG	Zinc	7440-66-6	ID	9	9	2.86E+01	4.48E+01								1.7E+05	2.6E-04							6.3E+05	7.1E-05
PAOC04	VOC	Acetone	67-64-1	ID	6	2	7.10E-03	2.90E-02								2.3E+04	1.3E-06	1.1E+05	2.6E-07	1.6E+05	1.8E-07	1.7E+08	1.7E-10	7.3E+04	4.0E-07
PAOC04	VOC	Benzene	71-43-2	A	6	1	4.30E-04	4.30E-04		1.6E+00	2.7E-04	1.3E+01	3.3E-05	3.8E+05	1.1E-09	1.8E+02	2.4E-06	8.4E+00	5.1E-05	4.5E+01	9.6E-06	4.7E+05	9.1E-10	4.0E+02	1.1E-06
PAOC04	VOC	2-Butanone	78-93-3	ID	6	2	1.80E-03	6.50E-03		2.7E+04	2.4E-07	2.9E+04	2.2E-07	6.7E+07	9.7E-11	2.7E+04	2.4E-07	2.7E+04	2.4E-07	3.5E+04	1.9E-07	2.9E+07	2.2E-10	2.7E+04	2.4E-07
PAOC04	VOC	Carbon Disulfide	75-15-0		6	1	5.70E-04	5.70E-04		7.6E+01	7.5E-06	1.3E+03	4.4E-07	4.7E+07	1.2E-11	2.8E+02	2.0E-06	1.4E+02	4.1E-06	1.6E+03	3.6E-07	2.1E+07	2.7E-11	2.8E+02	2.0E-06
PAOC04	VOC	Cyclohexane	110-82-7	ID	6	1	5.20E-04	5.20E-04																	
PAOC04	VOC	Ethyl Benzene	100-41-4	D	6	1	2.50E-04	2.50E-04		8.7E+01	2.9E-06	7.2E+02	3.5E-07	1.0E+07	2.5E-11	1.4E+02	1.8E-06	1.4E+02	1.8E-06	2.4E+03	1.0E-07	1.3E+07	1.9E-11	1.4E+02	1.8E-06
PAOC04	VOC	Methylcyclohexane	108-87-2		6	1	3.00E-04	3.00E-04																	
PAOC04	VOC	Methylene Chloride	75-09-2	B2	6	2	6.60E-04	3.00E-03		4.5E+01	6.7E-05	2.1E+02	1.4E-05	6.6E+06	4.5E-10	1.3E+03	2.3E-06	2.4E+02	1.3E-05	7.0E+02	4.3E-06	8.3E+06	3.6E-10	2.3E+03	1.3E-06
PAOC04	VOC	Toluene	108-88-3	ID	6	2	3.00E-04	1.00E-03		2.5E+02	4.0E-06	2.8E+03	3.6E-07	2.7E+07	3.7E-11	2.5E+02	4.0E-06	2.5E+02	4.0E-06	3.3E+03	3.0E-07	1.2E+07	8.3E-11	2.5E+02	4.0E-06
PAOC04	VOC	Xylenes (total)	1330-20-7	ID	6	1	1.40E-03	1.40E-03		1.5E+02	9.3E-06	4.6E+04	3.0E-08	2.9E+08	4.8E-12	1.5E+02	9.3E-06	1.5E+02	9.3E-06	5.4E+04	2.6E-08	1.3E+08	1.1E-11	1.5E+02	9.3E-06
PAOC04	SVOC	Acenaphthene	83-32-9		6	1	1.80E-01	1.80E-01		1.9E+05	9.5E-07	8.1E+04	2.2E-06	1.4E+07	1.3E-08	4.1E+04	4.4E-06	3.5E+05	5.1E-07	9.7E+04	1.9E-06	6.2E+06	2.9E-08	1.3E+05	1.4E-06
PAOC04	SVOC	Acenaphthylene	208-96-8	D	6	1	2.90E-02	2.90E-02		1.6E+03	1.8E-05	2.2E+03	1.3E-05	2.3E+06	1.3E-08	1.6E+03	1.8E-05	3.0E+03	9.7E-06	2.7E+03	1.1E-05	1.0E+06	2.9E-08	5.2E+03	5.6E-06
PAOC04	SVOC	Anthracene	120-12-7	D	6	2	6.10E-02	5.60E-01		1.0E+06	5.6E-07	1.4E+06	4.0E-07	6.7E+07	8.4E-09	2.3E+05	2.4E-06	1.0E+06	5.6E-07	1.6E+06	3.5E-07	2.9E+07	1.9E-08	7.3E+05	7.7E-07
PAOC04	SVOC	Benzo(a)anthracene	56-55-3	B2	6	3	2.30E-02	6.90E-01								2.0E+01	3.5E-02							8.0E+01	8.6E-03
PAOC04	SVOC	Benzo(a)pyrene	50-32-8	B2	6	3	1.90E-02	4.60E-01						1.5E+03	3.1E-04	2.0E+00	2.3E-01					1.9E+03	2.4E-04	8.0E+00	5.8E-02
PAOC04	SVOC	Benzo(b)fluoranthene	205-99-2	B2	6	3	2.30E-02	4.30E-01								2.0E+01	2.2E-02							8.0E+01	5.4E-03
PAOC04	SVOC	Benzo(g,h,i)perylene	191-24-2	D	6	3	1.50E-02	3.80E-01						8.0E+05	4.8E-07	2.5E+03	1.5E-04					3.5E+05	1.1E-06	7.0E+03	5.4E-05
PAOC04	SVOC	Benzo(k)fluoranthene	207-08-9	B2	6	2	1.00E-02	2.20E-01								2.0E+02	1.1E-03							8.0E+02	2.8E-04
PAOC04	SVOC	Chrysene	218-01-9	B2	6	3	2.90E-02	9.60E-01								2.0E+03	4.8E-04							8.0E+03	1.2E-04
PAOC04	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	6	1	9.80E-02	9.80E-02								2.0E+00	4.9E-02							8.0E+00	1.2E-02
PAOC04	SVOC	Fluoranthene	206-44-0	D	6	2	4.00E-02	6.80E-01		1.0E+06	6.8E-07	7.4E+05	9.2E-07	9.3E+06	7.3E-08	4.6E+04	1.5E-05	1.0E+06	6.8E-07	8.9E+05	7.6E-07	4.1E+06	1.7E-07	1.3E+05	5.2E-06
PAOC04	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	6	3	1.20E-02	2.00E-01								2.0E+01	1.0E-02							8.0E+01	2.5E-03
PAOC04	SVOC	2-Methylnaphthalene	91-57-6	ID	6	2	8.60E-03	1.70E-01								8.1E+03	2.1E-05							2.6E+04	6.5E-06
PAOC04	SVOC	Naphthalene	91-20-3	C	6	1	7.40E-02	7.40E-02		2.5E+02	3.0E-04	3.0E+02	2.5E-04	2.0E+05	3.7E-07	1.6E+04	4.6E-06	4.7E+02	1.6E-04	3.5E+02	2.1E-04	8.8E+04	8.4E-07	5.2E+04	1.4E-06
PAOC04	SVOC	Phenanthrene	85-01-8	D	6	4	8.60E-03	1.50E+00		2.8E+03	5.4E-04	1.6E+02	9.4E-03	6.7E+03	2.2E-04	1.6E+03	9.4E-04	5.1E+03	2.9E-04	1.9E+02	7.9E-03	2.9E+03	5.2E-04	5.2E+03	2.9E-04
PAOC04	SVOC	Pyrene	129-00-0	NC	6	3	3.30E-02	1.80E+00		1.0E+06	1.8E-06	6.5E+05	2.8E-06	6.7E+06	2.7E-07	2.9E+04	6.2E-05	1.0E+06	1.8E-06	7.8E+05	2.3E-06	2.9E+06	6.2E-07	8.4E+04	2.1E-05
PAOC04	PCB	PCBs (total)	1336-36-3	B2	6	1	5.07E-02	5.07E-02		3.0E+03	1.7E-05	2.4E+02	2.1E-04	5.2E+03	9.8E-06	4.0E+00	1.3E-02	1.6E+04	3.2E-06	8.1E+02	6.3E-05	6.5E+03	7.8E-06	1.6E+01	3.2E-03
PAOC04	INORG	Antimony	7440-36-0		6	4	9.10E-02	3.20E-01						1.3E+04	2.5E-05	1.8E+02	1.8E-03					5.9E+03	5.4E-05	6.7E+02	4.8E-04
PAOC04	INORG	Arsenic	7440-38-2	A	6	6	3.30E+00	1.21E+01						7.2E+02	1.7E-02	7.6E+00									

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Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC05	VOC	Methylcyclohexane	108-87-2		11	3	5.80E-04	6.10E-02																	
PAOC05	VOC	Toluene	108-88-3	ID	123	19	3.00E-04	8.50E+02		2.5E+02	3.4E+00	2.8E+03	3.0E-01	2.7E+07	3.1E-05	2.5E+02	3.4E+00	2.5E+02	3.4E+00	3.3E+03	2.6E-01	1.2E+07	7.1E-05	2.5E+02	3.4E+00
PAOC05	VOC	Trichloroethene	79-01-6	C-B2	23	2	8.00E-04	1.10E-03		7.1E+00	1.5E-04	7.8E+01	1.4E-05	1.8E+06	6.1E-10	5.0E+02	2.2E-06	3.7E+01	3.0E-05	2.6E+02	4.2E-06	2.3E+06	4.8E-10	5.0E+02	2.2E-06
PAOC05	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	11	3	8.50E-04	2.50E+00		1.1E+02	2.3E-02	2.1E+04	1.2E-04	8.2E+07	3.0E-08	1.1E+02	2.3E-02	1.1E+02	2.3E-02	2.5E+04	1.0E-04	3.6E+07	6.9E-08	1.1E+02	2.3E-02
PAOC05	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	11	1	4.50E-01	4.50E-01		9.4E+01	4.8E-03	1.6E+04	2.8E-05	8.2E+07	5.5E-09	9.4E+01	4.8E-03	9.4E+01	4.8E-03	1.9E+04	2.4E-05	3.6E+07	1.3E-08	9.4E+01	4.8E-03
PAOC05	VOC	Xylenes (total)	1330-20-7	ID	123	26	5.90E-04	2.30E+04		1.5E+02	1.5E+02	4.6E+04	5.0E-01	2.9E+08	7.9E-05	1.5E+02	1.5E+02	1.5E+02	1.5E+02	5.4E+04	4.3E-01	1.3E+08	1.8E-04	1.5E+02	1.5E+02
PAOC05	SVOC	Acenaphthene	83-32-9		72	2	1.00E-01	2.10E-01		1.9E+05	1.1E-06	8.1E+04	2.6E-06	1.4E+07	1.5E-08	4.1E+04	5.1E-06	3.5E+05	6.0E-07	9.7E+04	2.2E-06	6.2E+06	3.4E-08	1.3E+05	1.6E-06
PAOC05	SVOC	Acenaphthylene	208-96-8	D	72	2	2.50E-02	4.70E-01		1.6E+03	2.9E-04	2.2E+03	2.1E-04	2.3E+06	2.0E-07	1.6E+03	2.9E-04	3.0E+03	1.6E-04	2.7E+03	1.7E-04	1.0E+06	4.7E-07	5.2E+03	9.0E-05
PAOC05	SVOC	Anthracene	120-12-7	D	72	2	2.30E-01	8.20E-01		1.0E+06	8.2E-07	1.4E+06	5.9E-07	6.7E+07	1.2E-08	2.3E+05	3.6E-06	1.0E+06	8.2E-07	1.6E+06	5.1E-07	2.9E+07	2.8E-08	7.3E+05	1.1E-06
PAOC05	SVOC	Benzo(a)anthracene	56-55-3	B2	72	5	1.50E-02	3.70E+00								2.0E+01	1.9E-01							8.0E+01	4.6E-02
PAOC05	SVOC	Benzo(a)pyrene	50-32-8	B2	72	5	1.20E-02	2.60E+00						1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC05	SVOC	Benzo(b)fluoranthene	205-99-2	B2	72	5	1.30E-02	3.60E+00								2.0E+01	1.8E-01							8.0E+01	4.5E-02
PAOC05	SVOC	Benzo(g,h,i)perylene	191-24-2	D	72	5	1.20E-02	1.50E+00						8.0E+05	1.9E-06	2.5E+03	6.0E-04					3.5E+05	4.3E-06	7.0E+03	2.1E-04
PAOC05	SVOC	Benzo(k)fluoranthene	207-08-9	B2	72	3	1.10E-02	1.30E+00								2.0E+02	6.5E-03							8.0E+02	1.6E-03
PAOC05	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	13	3	2.10E-02	6.10E-02						7.0E+05	8.7E-08	2.8E+03	2.2E-05					8.9E+05	6.9E-08	1.0E+04	6.1E-06
PAOC05	SVOC	Carbazole	86-74-8	B2	13	2	9.30E-02	2.00E-01								5.3E+02	3.8E-04							2.4E+03	8.3E-05
PAOC05	SVOC	Chrysene	218-01-9	B2	72	5	2.30E-02	2.90E+00								2.0E+03	1.5E-03							8.0E+03	3.6E-04
PAOC05	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	72	2	9.60E-02	4.30E-01								2.0E+00	2.2E-01							8.0E+00	5.4E-02
PAOC05	SVOC	Dibenzofuran	132-64-9	D	13	3	5.10E-02	2.20E-01																	
PAOC05	SVOC	Fluoranthene	206-44-0	D	72	6	2.30E-02	1.00E+01		1.0E+06	1.0E-05	7.4E+05	1.4E-05	9.3E+06	1.1E-06	4.6E+04	2.2E-04	1.0E+06	1.0E-05	8.9E+05	1.1E-05	4.1E+06	2.4E-06	1.3E+05	7.7E-05
PAOC05	SVOC	Fluorene	86-73-7	D	72	2	6.00E-02	2.80E-01		5.8E+05	4.8E-07	1.3E+05	2.2E-06	9.3E+06	3.0E-08	2.7E+04	1.0E-05	1.0E+06	2.8E-07	1.5E+05	1.9E-06	4.1E+06	6.8E-08	8.7E+04	3.2E-06
PAOC05	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	72	3	1.50E-02	1.40E+00								2.0E+01	7.0E-02							8.0E+01	1.8E-02
PAOC05	SVOC	2-Methylnaphthalene	91-57-6	ID	72	3	7.70E-03	2.20E-01								8.1E+03	2.7E-05							2.6E+04	8.5E-06
PAOC05	SVOC	Naphthalene	91-20-3	C	72	3	6.40E-02	1.60E-01		2.5E+02	6.4E-04	3.0E+02	5.3E-04	2.0E+05	8.0E-07	1.6E+04	1.0E-05	4.7E+02	3.4E-04	3.5E+02	4.6E-04	8.8E+04	1.8E-06	5.2E+04	3.1E-06
PAOC05	SVOC	Phenanthrene	85-01-8	D	72	9	8.90E-03	3.40E+00		2.8E+03	1.2E-03	1.6E+02	2.1E-02	6.7E+03	5.1E-04	1.6E+03	2.1E-03	5.1E+03	6.7E-04	1.9E+02	1.8E-02	2.9E+03	1.2E-03	5.2E+03	6.5E-04
PAOC05	SVOC	Pyrene	129-00-0	NC	72	6	2.50E-02	8.10E+00		1.0E+06	8.1E-06	6.5E+05	1.2E-05	6.7E+06	1.2E-06	2.9E+04	2.8E-04	1.0E+06	8.1E-06	7.8E+05	1.0E-05	2.9E+06	2.8E-06	8.4E+04	9.6E-05
PAOC05	PCB	PCBs (total)	1336-36-3	B2	72	4	5.40E-02	6.70E-01		3.0E+03	2.2E-04	2.4E+02	2.8E-03	5.2E+03	1.3E-04	4.0E+00	1.7E-01	1.6E+04	4.2E-05	8.1E+02	8.3E-04	6.5E+03	1.0E-04	1.6E+01	4.2E-02
PAOC05	INORG	Antimony	7440-36-0		13	10	4.30E-02	5.30E-01						1.3E+04	4.1E-05	1.8E+02	2.9E-03					5.9E+03	9.0E-05	6.7E+02	7.9E-04
PAOC05	INORG	Arsenic	7440-38-2	A	13	13	1.10E+00	7.40E+00						7.2E+02	1.0E-02	7.6E+00	9.7E-01					9.1E+02	8.1E-03	3.7E+01	2.0E-01
PAOC05	INORG	Barium	7440-39-3	NC	13	13	1.52E+01	1.30E+02						3.3E+05	3.9E-04	3.7E+04	3.5E-03					1.5E+05	8.7E-04	1.3E+05	1.0E-03
PAOC05	INORG	Beryllium	7440-41-7	B1	13	8	1.50E-01	1.10E+00						1.3E+03	8.5E-04	4.1E+02	2.7E-03					5.9E+02	1.9E-03	1.6E+03	6.9E-04
PAOC05	INORG	Cadmium	7440-43-9	B1	78	72	1.60E-01	7.20E+00						1.7E+03	4.2E-03	5.5E+02	1.3E-02					2.2E+03	3.3E-03	2.1E+03	3.4E-03
PAOC05	INORG	Chromium (total)	7440-47-3		65	65	6.00E+00	2.70E+01						2.6E+02	1.0E-01	2.5E+03	1.1E-02					2.4E+02	1.1E-01	9.2E+03	2.9E-03
PAOC05	INORG	Chromium III	16065-83-1	D	13	13	6.18E+00	3.31E+01						3.3E+05	1.0E-04	7.9E+05	4.2E-05					1.5E+05	2.2E-04	1.0E+06	3.3E-05
PAOC05	INORG	Chromium VI	18540-29-9	A	13	7	4.10E-01	1.80E+00						2.6E+02	6.9E-03	2.5E+03	7.2E-04					2.4E+02	7.5E-03	9.2E+03	2.0E-04
PAOC05	INORG	Cobalt	7440-48-4	LC	13	13	2.60E+00	8.90E+00						1.3E+04	6.8E-04	2.6E+03	3.4E-03					5.9E+03	1.5E-03	9.0E+03	9.9E-04
PAOC05	INORG	Copper	7440-50-8	D	13	13	8.10E+00	1.42E+02						1.3E+05	1.1E-03	2.0E+04	7.1E-03					5.9E+04	2.4E-03	7.3E+04	1.9E-03
PAOC05	INORG	Cyanide (total)	57-12-5	D	13	1	6.40E-01	6.40E-01						2.5E+02	2.6E-03	1.2E+01	5.3E-02					2.5E+02	2.6E-03	2.5E+02	2.6E-03
PAOC05	INORG	Lead	7439-92-1	B2	78	78	2.10E+00	1.94E+01						1.0E+05	1.9E-04	4.0E+02	4.9E-02					4.4E+04	4.4E-04	9.0E+02	2.2E-02
PAOC05	INORG	Manganese	7439-96-5	D	13	13	1.30E+02	9.21E+02	4.40E+02					3.3E+03	1.5E-01	2.5E+04	1.9E-02					1.5E+03	3.2E-01	9.0E+04	5.3E-03
PAOC05	INORG	Mercury	7439-97-6	D	13	8	1.90E-02	1.00E-01		4.8E+01	2.1E-03	5.2E+01	1.9E-03	2.0E+04	5.0E-06	1.6E+02	6.3E-04	8.9E+01	1.1E-03	6.2E+01	1.6E-03	8.8E+03	1.1E-05	5.8E+02	1.7E-04
PAOC05	INORG	Nickel	7440-02-0	A	13	13	5.70E+00	2.48E+01						1.3E+04	1.9E-03	4.0E+04	6.2E-04					1.6E+04	1.6E-03	1.5E+05	1.7E-04
PAOC05	INORG	Selenium	7782-49-2	D	13	7	1.50E-01	5.70E-01						1.3E+05	4.4E-06	2.6E+03	2.2E-04					5.9E+04	9.7E-06	9.6E+03	5.9E-05
PAOC05	INORG	Silver	7440-22-4	D	13	13	3.00E-02	1.80E-01						6.7E+03	2.7E-05	2.5E+03	7.2E-05					2.9E+03	6.2E-05	9.0E+03	2.0E-05
PAOC05	INORG	Thallium	7440-28-0		13	12	4.10E-02	2.70E-01								3.5E+01	7.7E-03							1.3E+02	2.1E-03
PAOC05	INORG	Vanadium	7440-62-2		13	13	1.02E+01	2.45E+01								7.5E+02	3.3E-02							5.5E+03	4.5E-03
PAOC05	INORG	Zinc	7440-66-6	ID	13	13	1.46E+01	5.28E+01								1.7E+05	3.1E-04							6.3E+05	8.4E-05
PAOC06	VOC	Acetone	67-64-1	ID	9	2	7.00E-03	8.10E-03		1.1E+05	7.4E-08	1.3E+05	6.2E-08	3.9E+08	2.1E-11	2.3E+04	3.5E-07	1.1E+05	7.4E-08	1.6E+05	5.1E-08	1.7E+08	4.8E-11	7.3E+04	1.1E-07
PAOC06	VOC	Benzene	71-43-2	A	9	1	2.20E-04	2.20E-04		1.6E+00	1.4E-04	1.3E+01	1.7E-05	3.8E+05	5.8E-10	1.8E+02	1.2E-06	8.4E+00	2.6E-05	4.5E+01	4.9E-06	4.7E+05	4.7E-10	4.0E+02	5.5E-07
PAOC06	VOC	2-Butanone	78-93-3	ID	9	1	1.90E-03	1.90E-03		2.7E+04	7.0E-08	2.9E+04	6.6E-08	6.7E+07	2.8E-11	2.7E+04	7.0E-08	2.7E+04	7.0E-08	3.5E+04	5.4E-08	2.9E+07	6.6E-11	2.7E+04	7.0E-08
PAOC06	VOC	Carbon Disulfide	75-15-0		9	1	4.10E-03	4.10E-03		7.6E+01	5.4E-05	1.3E+03	3.2E-06	4.7E+07	8.7E-11	2.8E+02	1.5E-05	1.4E+02	2.9E-05	1.6E+03	2.6E				

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC06	INORG	Mercury	7439-97-6	D	9	7	1.80E-02	6.30E-02		4.8E+01	1.3E-03	5.2E+01	1.2E-03	2.0E+04	3.2E-06	1.6E+02	3.9E-04	8.9E+01	7.1E-04	6.2E+01	1.0E-03	8.8E+03	7.2E-06	5.8E+02	1.1E-04
PAOC06	INORG	Nickel	7440-02-0	A	9	9	8.00E+00	1.71E+01						1.3E+04	1.3E-03	4.0E+04	4.3E-04					1.6E+04	1.1E-03	1.5E+05	1.1E-04
PAOC06	INORG	Selenium	7782-49-2	D	9	8	1.00E-01	9.00E-01						1.3E+05	6.9E-06	2.6E+03	3.5E-04					5.9E+04	1.5E-05	9.6E+03	9.4E-05
PAOC06	INORG	Silver	7440-22-4	D	9	4	3.70E-02	1.00E-01						6.7E+03	1.5E-05	2.5E+03	4.0E-05					2.9E+03	3.4E-05	9.0E+03	1.1E-05
PAOC06	INORG	Thallium	7440-28-0		9	7	7.90E-02	2.60E-01								3.5E+01	7.4E-03							1.3E+02	2.0E-03
PAOC06	INORG	Vanadium	7440-62-2		9	9	8.20E+00	2.05E+01								7.5E+02	2.7E-02							5.5E+03	3.7E-03
PAOC06	INORG	Zinc	7440-66-6	ID	9	9	1.72E+01	6.34E+01								1.7E+05	3.7E-04							6.3E+05	1.0E-04
PAOC07	VOC	Acetone	67-64-1	ID	1	1	1.20E-02	1.20E-02		1.1E+05	1.1E-07	1.3E+05	9.2E-08	3.9E+08	3.1E-11	2.3E+04	5.2E-07	1.1E+05	1.1E-07	1.6E+05	7.5E-08	1.7E+08	7.1E-11	7.3E+04	1.6E-07
PAOC07	VOC	2-Butanone	78-93-3	ID	1	1	2.60E-03	2.60E-03		2.7E+04	9.6E-08	2.9E+04	9.0E-08	6.7E+07	3.9E-11	2.7E+04	9.6E-08	2.7E+04	9.6E-08	3.5E+04	7.4E-08	2.9E+07	9.0E-11	2.7E+04	9.6E-08
PAOC07	INORG	Antimony	7440-36-0		1	1	7.20E-02	7.20E-02						1.3E+04	5.5E-06	1.8E+02	4.0E-04					5.9E+03	1.2E-05	6.7E+02	1.1E-04
PAOC07	INORG	Arsenic	7440-38-2	A	1	1	5.00E+00	5.00E+00						7.2E+02	6.9E-03	7.6E+00	6.6E-01					9.1E+02	5.5E-03	3.7E+01	1.4E-01
PAOC07	INORG	Barium	7440-39-3	NC	1	1	7.12E+01	7.12E+01						3.3E+05	2.2E-04	3.7E+04	1.9E-03					1.5E+05	4.7E-04	1.3E+05	5.5E-04
PAOC07	INORG	Beryllium	7440-41-7	B1	1	1	3.50E-01	3.50E-01						1.3E+03	2.7E-04	4.1E+02	8.5E-04					5.9E+02	5.9E-04	1.6E+03	2.2E-04
PAOC07	INORG	Chromium III	16065-83-1	D	1	1	1.71E+01	1.71E+01						3.3E+05	5.2E-05	7.9E+05	2.2E-05					1.5E+05	1.1E-04	1.0E+06	1.7E-05
PAOC07	INORG	Chromium VI	18540-29-9	A	1	1	7.80E-01	7.80E-01						2.6E+02	3.0E-03	2.5E+03	3.1E-04					2.4E+02	3.3E-03	9.2E+03	8.5E-05
PAOC07	INORG	Cobalt	7440-48-4	LC	1	1	9.10E+00	9.10E+00						1.3E+04	7.0E-04	2.6E+03	3.5E-03					5.9E+03	1.5E-03	9.0E+03	1.0E-03
PAOC07	INORG	Copper	7440-50-8	D	1	1	1.43E+01	1.43E+01						1.3E+05	1.1E-04	2.0E+04	7.2E-04					5.9E+04	2.4E-04	7.3E+04	2.0E-04
PAOC07	INORG	Lead	7439-92-1	B2	1	1	1.25E+01	1.25E+01						1.0E+05	1.3E-04	4.0E+02	3.1E-02					4.4E+04	2.8E-04	9.0E+02	1.4E-02
PAOC07	INORG	Manganese	7439-96-5	D	1	1	4.27E+02	4.27E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC07	INORG	Mercury	7439-97-6	D	1	1	4.50E-02	4.50E-02		4.8E+01	9.4E-04	5.2E+01	8.7E-04	2.0E+04	2.3E-06	1.6E+02	2.8E-04	8.9E+01	5.1E-04	6.2E+01	7.3E-04	8.8E+03	5.1E-06	5.8E+02	7.8E-05
PAOC07	INORG	Nickel	7440-02-0	A	1	1	2.20E+01	2.20E+01						1.3E+04	1.7E-03	4.0E+04	5.5E-04					1.6E+04	1.4E-03	1.5E+05	1.5E-04
PAOC07	INORG	Selenium	7782-49-2	D	1	1	1.20E-01	1.20E-01						1.3E+05	9.2E-07	2.6E+03	4.6E-05					5.9E+04	2.0E-06	9.6E+03	1.3E-05
PAOC07	INORG	Silver	7440-22-4	D	1	1	7.70E-02	7.70E-02						6.7E+03	1.1E-05	2.5E+03	3.1E-05					2.9E+03	2.7E-05	9.0E+03	8.6E-06
PAOC07	INORG	Thallium	7440-28-0		1	1	1.70E-01	1.70E-01								3.5E+01	4.9E-03							1.3E+02	1.3E-03
PAOC07	INORG	Vanadium	7440-62-2		1	1	2.36E+01	2.36E+01								7.5E+02	3.1E-02							5.5E+03	4.3E-03
PAOC07	INORG	Zinc	7440-66-6	ID	1	1	4.05E+01	4.05E+01								1.7E+05	2.4E-04							6.3E+05	6.4E-05
PAOC08	VOC	Acetone	67-64-1	ID	1	1	1.30E-02	1.30E-02		1.1E+05	1.2E-07	1.3E+05	1.0E-07	3.9E+08	3.3E-11	2.3E+04	5.7E-07	1.1E+05	1.2E-07	1.6E+05	8.1E-08	1.7E+08	7.6E-11	7.3E+04	1.8E-07
PAOC08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC08	INORG	Antimony	7440-36-0		1	1	4.90E-02	4.90E-02						1.3E+04	3.8E-06	1.8E+02	2.7E-04					5.9E+03	8.3E-06	6.7E+02	7.3E-05
PAOC08	INORG	Arsenic	7440-38-2	A	1	1	7.40E+00	7.40E+00						7.2E+02	1.0E-02	7.6E+00	9.7E-01					9.1E+02	8.1E-03	3.7E+01	2.0E-01
PAOC08	INORG	Barium	7440-39-3	NC	1	1	4.36E+01	4.36E+01						3.3E+05	1.3E-04	3.7E+04	1.2E-03					1.5E+05	2.9E-04	1.3E+05	3.4E-04
PAOC08	INORG	Beryllium	7440-41-7	B1	1	1	3.60E-01	3.60E-01						1.3E+03	2.8E-04	4.1E+02	8.8E-04					5.9E+02	6.1E-04	1.6E+03	2.3E-04
PAOC08	INORG	Cadmium	7440-43-9	B1	1	1	2.30E-01	2.30E-01						1.7E+03	1.4E-04	5.5E+02	4.2E-04					2.2E+03	1.0E-04	2.1E+03	1.1E-04
PAOC08	INORG	Chromium III	16065-83-1	D	1	1	1.16E+01	1.16E+01						3.3E+05	3.5E-05	7.9E+05	1.5E-05					1.5E+05	7.7E-05	1.0E+06	1.2E-05
PAOC08	INORG	Chromium VI	18540-29-9	A	1	1	1.20E+00	1.20E+00						2.6E+02	4.6E-03	2.5E+03	4.8E-04					2.4E+02	5.0E-03	9.2E+03	1.3E-04
PAOC08	INORG	Cobalt	7440-48-4	LC	1	1	6.80E+00	6.80E+00						1.3E+04	5.2E-04	2.6E+03	2.6E-03					5.9E+03	1.2E-03	9.0E+03	7.6E-04
PAOC08	INORG	Copper	7440-50-8	D	1	1	1.38E+01	1.38E+01						1.3E+05	1.1E-04	2.0E+04	6.9E-04					5.9E+04	2.3E-04	7.3E+04	1.9E-04
PAOC08	INORG	Lead	7439-92-1	B2	1	1	5.50E+00	5.50E+00						1.0E+05	5.5E-05	4.0E+02	1.4E-02					4.4E+04	1.3E-04	9.0E+02	6.1E-03
PAOC08	INORG	Manganese	7439-96-5	D	1	1	3.08E-02	3.08E-02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC08	INORG	Mercury	7439-97-6	D	1	1	1.90E-02	1.90E-02		4.8E+01	4.0E-04	5.2E+01	3.7E-04	2.0E+04	9.5E-07	1.6E+02	1.2E-04	8.9E+01	2.1E-04	6.2E+01	3.1E-04	8.8E+03	2.2E-06	5.8E+02	3.3E-05
PAOC08	INORG	Nickel	7440-02-0	A	1	1	1.63E+01	1.63E+01						1.3E+04	1.3E-03	4.0E+04	4.1E-04					1.6E+04	1.0E-03	1.5E+05	1.1E-04
PAOC08	INORG	Selenium	7782-49-2	D	1	1	3.70E-01	3.70E-01						1.3E+05	2.8E-06	2.6E+03	1.4E-04					5.9E+04	6.3E-06	9.6E+03	3.9E-05
PAOC08	INORG	Thallium	7440-28-0		1	1	1.20E-01	1.20E-01								3.5E+01	3.4E-03							1.3E+02	9.2E-04
PAOC08	INORG	Vanadium	7440-62-2		1	1	1.76E+01	1.76E+01								7.5E+02	2.3E-02							5.5E+03	3.2E-03
PAOC08	INORG	Zinc	7440-66-6	ID	1	1	2.86E+01	2.86E+01								1.7E+05	1.7E-04							6.3E+05	4.5E-05
PAOC09	VOC	cis-1,2-Dichloroethene	156-59-2	ID	3	2	4.10E-01	7.30E-01		2.2E+01	3.3E-02	1.8E+02	4.1E-03	2.3E+06	3.2E-07	6.4E+02	1.1E-03	4.1E+01	1.8E-02	2.1E+02	3.5E-03	1.0E+06	7.3E-07	6.4E+02	1.1E-03
PAOC09	VOC	trans-1,2-Dichloroethene	156-60-5		3	2	4.80E-02	9.00E-02		2.3E+01	3.9E-03	2.8E+02	3.2E-04	4.7E+06	1.9E-08	1.4E+03	6.4E-05	4.3E+01	2.1E-03	3.3E+02	2.7E-04	2.1E+06	4.3E-08	1.4E+03	6.4E-05
PAOC09	VOC	Toluene	108-88-3	ID	3	1	2.90E-04	2.90E-04		2.5E+02	1.2E-06	2.8E+03	1.0E-07	2.7E+07	1.1E-11	2.5E+02	1.2E-06	2.5E+02	1.2E-06	3.3E+03	8.8E-08	1.2E+07	2.4E-11	2.5E+02	1.2E-06
PAOC09	VOC	Trichloroethene	79-01-6	C-B2	3	2	1.20E-01	2.20E-01		7.1E+00	3.1E-02	7.8E+01	2.8E-03	1.8E+06	1.2E-07	5.0E+02	4.4E-04	3.7E+01	5.9E-03	2.6E+02	8.5E-04	2.3E+06	9.6E-08	5.0E+02	4.4E-04
PAOC09	VOC	Vinyl Chloride	75-01-4	A	3	2	4.50E-02	6.60E-02		2.7E-01	2.4E-01	4.2E+00	1.6E-02	3.5E+05	1.9E-07	3.8E+00	1.7E-02	2.8E+00	2.4E-02	2.9E+01	2.3E-03	8.9E+05	7.4E-08	3.4E+01	1.9E-03
PAOC09	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	3	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC09	SVOC	Fluoranthene	206-44-0	D	3	2	9.50E-03	9.60E-03		1.0E+06	9.6E-09	7.4E+05	1.3E-08	9.3E+06	1.0E-09	4.6E+04	2.1E-07	1.0E+06	9.6E-09	8.9E+05	1.1E-08	4.1E+06	2.3E-09	1.3E+05	7.4E-08
PAOC09	SVOC	Phenanthrene	85-01-8	D	3	2	7.50E-03	7.80E-03		2.8E+03	2.8E-06	1.6E+02	4.9E-05	6.7											

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC10	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	2	1	5.20E-02	5.20E-02		1.1E+02	4.7E-04	2.1E+04	2.5E-06	8.2E+07	6.3E-10	1.1E+02	4.7E-04	1.1E+02	4.7E-04	2.5E+04	2.1E-06	3.6E+07	1.4E-09	1.1E+02	4.7E-04
PAOC10	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	2	1	5.30E-02	5.30E-02		9.4E+01	5.6E-04	1.6E+04	3.3E-06	8.2E+07	6.5E-10	9.4E+01	5.6E-04	9.4E+01	5.6E-04	1.9E+04	2.8E-06	3.6E+07	1.5E-09	9.4E+01	5.6E-04
PAOC10	VOC	Xylenes (total)	1330-20-7	ID	2	1	8.10E-02	8.10E-02		1.5E+02	5.4E-04	4.6E+04	1.8E-06	2.9E+08	2.8E-10	1.5E+02	5.4E-04	1.5E+02	5.4E-04	5.4E+04	1.5E-06	1.3E+08	6.2E-10	1.5E+02	5.4E-04
PAOC10	SVOC	Acenaphthene	83-32-9		2	1	1.30E+00	1.30E+00		1.9E+05	6.8E-06	8.1E+04	1.6E-05	1.4E+07	9.3E-08	4.1E+04	3.2E-05	3.5E+05	3.7E-06	9.7E+04	1.3E-05	6.2E+06	2.1E-07	1.3E+05	1.0E-05
PAOC10	SVOC	Benzo(b)fluoranthene	205-99-2	B2	2	1	1.20E-02	1.20E-02								2.0E+01	6.0E-04							8.0E+01	1.5E-04
PAOC10	SVOC	Biphenyl	92-52-4	D	2	1	9.30E-01	9.30E-01																	
PAOC10	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	1	5.70E-01	5.70E-01						7.0E+05	8.1E-07	2.8E+03	2.0E-04					8.9E+05	6.4E-07	1.0E+04	5.7E-05
PAOC10	SVOC	Chrysene	218-01-9	B2	2	1	1.80E-01	1.80E-01								2.0E+03	9.0E-05							8.0E+03	2.3E-05
PAOC10	SVOC	Fluoranthene	206-44-0	D	2	1	3.10E-01	3.10E-01		1.0E+06	3.1E-07	7.4E+05	4.2E-07	9.3E+06	3.3E-08	4.6E+04	6.7E-06	1.0E+06	3.1E-07	8.9E+05	3.5E-07	4.1E+06	7.6E-08	1.3E+05	2.4E-06
PAOC10	SVOC	2-Methylnaphthalene	91-57-6	ID	2	2	2.10E-02	2.40E+00								8.1E+03	3.0E-04							2.6E+04	9.2E-05
PAOC10	SVOC	Naphthalene	91-20-3	C	2	2	1.20E-02	1.60E+00		2.5E+02	6.4E-03	3.0E+02	5.3E-03	2.0E+05	8.0E-06	1.6E+04	1.0E-04	4.7E+02	3.4E-03	3.5E+02	4.6E-03	8.8E+04	1.8E-05	5.2E+04	3.1E-05
PAOC10	SVOC	Phenanthrene	85-01-8	D	2	2	9.20E-03	2.60E+00		2.8E+03	9.3E-04	1.6E+02	1.6E-02	6.7E+03	3.9E-04	1.6E+03	1.6E-03	5.1E+03	5.1E-04	1.9E+02	1.4E-02	2.9E+03	9.0E-04	5.2E+03	5.0E-04
PAOC10	SVOC	Pyrene	129-00-0	NC	2	1	5.60E-01	5.60E+01		1.0E+06	5.6E-07	6.5E+05	8.6E-07	6.7E+06	8.4E-08	2.9E+04	1.9E-05	1.0E+06	5.6E-07	7.8E+05	7.2E-07	2.9E+06	1.9E-07	8.4E+04	6.7E-06
PAOC10	INORG	Arsenic	7440-38-2	A	2	2	3.10E+00	3.80E+00						7.2E+02	5.3E-03	7.6E+00	5.0E-01					9.1E+02	4.2E-03	3.7E+01	1.0E-01
PAOC10	INORG	Barium	7440-39-3	NC	2	2	6.30E+00	3.59E+01						3.3E+05	1.1E-04	3.7E+04	9.7E-04					1.5E+05	2.4E-04	1.3E+05	2.8E-04
PAOC10	INORG	Chromium III	16065-83-1	D	2	2	3.89E+00	9.98E+00						3.3E+05	3.0E-05	7.9E+05	1.3E-05					1.5E+05	6.7E-05	1.0E+06	1.0E-05
PAOC10	INORG	Cobalt	7440-48-4	LC	2	2	1.80E+00	5.40E+00						1.3E+04	4.2E-04	2.6E+03	2.1E-03					5.9E+03	9.2E-04	9.0E+03	6.0E-04
PAOC10	INORG	Copper	7440-50-8	D	2	2	3.80E+00	1.02E+01						1.3E+05	7.8E-05	2.0E+04	5.1E-04					5.9E+04	1.7E-04	7.3E+04	1.4E-04
PAOC10	INORG	Lead	7439-92-1	B2	2	2	3.20E+00	6.50E+00						1.0E+05	6.5E-05	4.0E+02	1.6E-02					4.4E+04	1.5E-04	9.0E+02	7.2E-03
PAOC10	INORG	Manganese	7439-96-5	D	2	2	1.16E+02	2.14E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC10	INORG	Nickel	7440-02-0	A	2	2	3.70E+00	1.32E+01						1.3E+04	1.0E-03	4.0E+04	3.3E-04					1.6E+04	8.3E-04	1.5E+05	8.8E-05
PAOC10	INORG	Selenium	7782-49-2	D	2	1	4.60E-01	4.60E-01						1.3E+05	3.5E-06	2.6E+03	1.8E-04					5.9E+04	7.8E-06	9.6E+03	4.8E-05
PAOC10	INORG	Silver	7440-22-4	D	2	2	2.10E-02	2.40E-02						6.7E+03	3.6E-06	2.5E+03	9.6E-06					2.9E+03	8.3E-06	9.0E+03	2.7E-06
PAOC10	INORG	Thallium	7440-28-0		2	1	1.20E-01	1.20E-01								3.5E+01	3.4E-03							1.3E+02	9.2E-04
PAOC10	INORG	Vanadium	7440-62-2		2	2	6.40E+00	1.31E+01								7.5E+02	1.7E-02							5.5E+03	2.4E-03
PAOC10	INORG	Zinc	7440-66-6	ID	2	2	2.01E+01	3.28E+01								1.7E+05	1.9E-04							6.3E+05	5.2E-05
PAOC11	VOC	Acetone	67-64-1	ID	1	1	6.00E-02	6.00E-02		1.1E+05	5.5E-07	1.3E+05	4.6E-07	3.9E+08	1.5E-10	2.3E+04	2.6E-06	1.1E+05	5.5E-07	1.6E+05	3.8E-07	1.7E+08	3.5E-10	7.3E+04	8.2E-07
PAOC11	VOC	2-Butanone	78-93-3	ID	1	1	1.50E-02	1.50E-02		2.7E+04	5.6E-07	2.9E+04	5.2E-07	6.7E+07	2.2E-10	2.7E+04	5.6E-07	2.7E+04	5.6E-07	3.5E+04	4.3E-07	2.9E+07	5.2E-10	2.7E+04	5.6E-07
PAOC11	SVOC	Benzo(b)fluoranthene	205-99-2	B2	1	1	8.10E-03	8.10E-03								2.0E+01	4.1E-04							8.0E+01	1.0E-04
PAOC11	SVOC	Fluoranthene	206-44-0	D	1	1	1.10E-02	1.10E-02		1.0E+06	1.1E-08	7.4E+05	1.5E-08	9.3E+06	1.2E-09	4.6E+04	2.4E-07	1.0E+06	1.1E-08	8.9E+05	1.2E-08	4.1E+06	2.7E-09	1.3E+05	8.5E-08
PAOC11	SVOC	Naphthalene	91-20-3	C	1	1	8.50E-03	8.50E-03		2.5E+02	3.4E-05	3.0E+02	2.8E-05	2.0E+05	4.3E-08	1.6E+04	5.3E-07	4.7E+02	1.8E-05	3.5E+02	2.4E-05	8.8E+04	9.7E-08	5.2E+04	1.6E-07
PAOC11	SVOC	Phenanthrene	85-01-8	D	1	1	9.10E-03	9.10E-03		2.8E+03	3.3E-06	1.6E+02	5.7E-05	6.7E+03	1.4E-06	1.6E+03	5.7E-06	5.1E+03	1.8E-06	1.9E+02	4.8E-05	2.9E+03	3.1E-06	5.2E+03	1.8E-06
PAOC11	SVOC	Pyrene	129-00-0	NC	1	1	1.00E-02	1.00E-02		1.0E+06	1.0E-08	6.5E+05	1.5E-08	6.7E+06	1.5E-09	2.9E+04	3.4E-07	1.0E+06	1.0E-08	7.8E+05	1.3E-08	2.9E+06	3.4E-09	8.4E+04	1.2E-07
PAOC11	INORG	Antimony	7440-36-0		1	1	5.50E+00	5.50E+00						1.3E+04	4.2E-04	1.8E+02	3.1E-02					5.9E+03	9.3E-04	6.7E+02	8.2E-03
PAOC11	INORG	Arsenic	7440-38-2	A	1	1	5.50E+00	5.50E+00						7.2E+02	7.6E-03	7.6E+00	7.2E-01					9.1E+02	6.0E-03	3.7E+01	1.5E-01
PAOC11	INORG	Barium	7440-39-3	NC	1	1	7.16E+01	7.16E+01						3.3E+05	2.2E-04	3.7E+04	1.9E-03					1.5E+05	4.8E-04	1.3E+05	5.5E-04
PAOC11	INORG	Beryllium	7440-41-7	B1	1	1	4.10E-01	4.10E-01						1.3E+03	3.2E-04	4.1E+02	1.0E-03					5.9E+02	6.9E-04	1.6E+03	2.6E-04
PAOC11	INORG	Cadmium	7440-43-9	B1	1	1	2.80E-01	2.80E-01						1.7E+03	1.6E-04	5.5E+02	5.1E-04					2.2E+03	1.3E-04	2.1E+03	1.3E-04
PAOC11	INORG	Chromium III	16065-83-1	D	1	1	1.03E+01	1.03E+01						3.3E+05	3.1E-05	7.9E+05	1.3E-05					1.5E+05	6.9E-05	1.0E+06	1.0E-05
PAOC11	INORG	Chromium VI	18540-29-9	A	1	1	5.70E-01	5.70E-01						2.6E+02	2.2E-03	2.5E+03	2.3E-04					2.4E+02	2.4E-03	9.2E+03	6.2E-05
PAOC11	INORG	Cobalt	7440-48-4	LC	1	1	5.20E+00	5.20E+00						1.3E+04	4.0E-04	2.6E+03	2.0E-03					5.9E+03	8.8E-04	9.0E+03	5.8E-04
PAOC11	INORG	Copper	7440-50-8	D	1	1	2.84E+02	2.84E+02						1.3E+05	2.2E-03	2.0E+04	1.4E-02					5.9E+04	4.8E-03	7.3E+04	3.9E-03
PAOC11	INORG	Lead	7439-92-1	B2	1	1	3.01E+02	3.01E+02						1.0E+05	3.0E-03	4.0E+02	7.5E-01					4.4E+04	6.8E-03	9.0E+02	3.3E-01
PAOC11	INORG	Manganese	7439-96-5	D	1	1	4.41E+02	4.41E+02	4.40E+02					3.3E+03	3.0E-04	2.5E+04	4.0E-05					1.5E+03	6.7E-04	9.0E+04	1.1E-05
PAOC11	INORG	Mercury	7439-97-6	D	1	1	3.40E-02	3.40E-02		4.8E+01	7.1E-04	5.2E+01	6.5E-04	2.0E+04	1.7E-06	1.6E+02	2.1E-04	8.9E+01	3.8E-04	6.2E+01	5.5E-04	8.8E+03	3.9E-06	5.8E+02	5.9E-05
PAOC11	INORG	Nickel	7440-02-0	A	1	1	7.00E+00	7.00E+00						1.3E+04	5.4E-04	4.0E+04	1.8E-04					1.6E+04	4.4E-04	1.5E+05	4.7E-05
PAOC11	INORG	Selenium	7782-49-2	D	1	1	3.70E-01	3.70E-01						1.3E+05	2.8E-06	2.6E+03	1.4E-04					5.9E+04	6.3E-06	9.6E+03	3.9E-05
PAOC11	INORG	Vanadium	7440-62-2		1	1	2.37E+01	2.37E+01								7.5E+02	3.2E-02							5.5E+03	4.3E-03
PAOC11	INORG	Zinc	7440-66-6	ID	1	1	2.54E+01	2.54E+01								1.7E+05	1.5E-04							6.3E+05	4.0E-05
PAOC11/PAOC14	INORG	Arsenic	7440-38-2	A	1	1	1.50E+00	1.50E+00						7.2E+02	2.1E-03	7.6E+00	2.0E-01					9.1E+02	1.6E-03	3.7E+01	4.1E-02
PAOC11/PAOC14	INORG	Barium	7440-39-3	NC	1	1	3.80E+01	3.80E+01						3.3E+05	1.2E-04	3.7E+04	1.0E-03					1.5E+05	2.5E-04	1.3E+05	2.9E-04
PAOC11/PAOC14	INORG	Beryllium	7440-41-7	B1	1	1	4.40E-01	4.40E-01						1.3E+03											

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC12	INORG	Chromium VI	18540-29-9	A	2	2	1.20E+00	1.70E+00						2.6E+02	6.5E-03	2.5E+03	6.8E-04					2.4E+02	7.1E-03	9.2E+03	1.8E-04
PAOC12	INORG	Cobalt	7440-48-4	LC	2	2	7.20E+00	8.20E+00						1.3E+04	6.3E-04	2.6E+03	3.2E-03					5.9E+03	1.4E-03	9.0E+03	9.1E-04
PAOC12	INORG	Copper	7440-50-8	D	2	2	6.71E+01	1.13E+02						1.3E+05	8.7E-04	2.0E+04	5.7E-03					5.9E+04	1.9E-03	7.3E+04	1.5E-03
PAOC12	INORG	Lead	7439-92-1	B2	3	3	1.45E+01	4.46E+02						1.0E+05	4.5E-03	4.0E+02	1.1E+00					4.4E+04	1.0E-02	9.0E+02	5.0E-01
PAOC12	INORG	Manganese	7439-96-5	D	2	2	3.17E+02	4.69E+02	4.40E+02					3.3E+03	8.8E-03	2.5E+04	1.2E-03					1.5E+03	1.9E-02	9.0E+04	3.2E-04
PAOC12	INORG	Mercury	7439-97-6	D	2	2	3.90E-01	4.40E-01		4.8E+01	9.2E-03	5.2E+01	8.5E-03	2.0E+04	2.2E-05	1.6E+02	2.8E-03	8.9E+01	4.9E-03	6.2E+01	7.1E-03	8.8E+03	5.0E-05	5.8E+02	7.6E-04
PAOC12	INORG	Nickel	7440-02-0	A	2	2	2.00E+01	2.88E+01						1.3E+04	2.2E-03	4.0E+04	7.2E-04					1.6E+04	1.8E-03	1.5E+05	1.9E-04
PAOC12	INORG	Selenium	7782-49-2	D	2	2	1.50E-01	3.30E-01						1.3E+05	2.5E-06	2.6E+03	1.3E-04					5.9E+04	5.6E-06	9.6E+03	3.4E-05
PAOC12	INORG	Silver	7440-22-4	D	2	2	1.30E-01	1.50E-01						6.7E+03	2.2E-05	2.5E+03	6.0E-05					2.9E+03	5.2E-05	9.0E+03	1.7E-05
PAOC12	INORG	Thallium	7440-28-0			2	2	1.70E-01	2.20E-01							3.5E+01	6.3E-03							1.3E+02	1.7E-03
PAOC12	INORG	Vanadium	7440-62-2			2	2	1.79E+01	2.00E+01							7.5E+02	2.7E-02							5.5E+03	3.6E-03
PAOC12	INORG	Zinc	7440-66-6	ID	2	2	7.90E+01	1.22E+02								1.7E+05	7.2E-04							6.3E+05	1.9E-04
PAOC13	VOC	Bromodichloromethane	75-27-4	B2	26	1	2.00E-02	2.00E-02		1.2E+00	1.7E-02	9.1E+00	2.2E-03	8.4E+04	2.4E-07	1.1E+02	1.8E-04	6.4E+00	3.1E-03	3.1E+01	6.5E-04	1.1E+05	1.8E-07	4.9E+02	4.1E-05
PAOC13	VOC	Chloroform	67-66-3	B2	26	2	1.50E-02	1.10E-01		7.2E+00	1.5E-02	4.5E+01	2.4E-03	1.3E+06	8.5E-08	1.2E+03	9.2E-05	3.8E+01	2.9E-03	1.5E+02	7.3E-04	1.6E+06	6.9E-08	1.5E+03	7.3E-05
PAOC13	VOC	Ethyl Benzene	100-41-4	D	26	4	2.90E-02	4.00E+01		8.7E+01	4.6E-01	7.2E+02	5.6E-02	1.0E+07	4.0E-06	1.4E+02	2.9E-01	1.4E+02	2.9E-01	2.4E+03	1.7E-02	1.3E+07	3.1E-06	1.4E+02	2.9E-01
PAOC13	VOC	Tetrachloroethene	127-18-4	C-B2	26	2	1.50E-02	2.60E-01		1.1E+01	2.4E-02	1.8E+02	1.4E-03	5.4E+06	4.8E-08	8.8E+01	3.0E-03	6.0E+01	4.3E-03	6.0E+02	4.3E-04	6.8E+06	3.8E-08	8.8E+01	3.0E-03
PAOC13	VOC	Toluene	108-88-3	ID	26	2	1.30E-02	2.40E+00		2.5E+02	9.6E-03	2.8E+03	8.6E-04	2.7E+07	8.9E-08	2.5E+02	9.6E-03	2.5E+02	9.6E-03	3.3E+03	7.3E-04	1.2E+07	2.0E-07	2.5E+02	9.6E-03
PAOC13	VOC	1,1,1-Trichloroethane	71-55-6	ID	26	3	1.30E-02	5.60E-02		2.5E+02	2.2E-04	3.8E+03	1.5E-05	6.7E+07	8.4E-10	4.6E+02	1.2E-04	4.6E+02	1.2E-04	4.5E+03	1.2E-05	2.9E+07	1.9E-09	4.6E+02	1.2E-04
PAOC13	VOC	Trichloroethene	79-01-6	C-B2	26	1	2.70E-01	2.70E-01		7.1E+00	3.8E-02	7.8E+01	3.5E-03	1.8E+06	1.5E-07	5.0E+02	5.4E-04	3.7E+01	7.3E-03	2.6E+02	1.0E-03	2.3E+06	1.2E-07	5.0E+02	5.4E-04
PAOC13	VOC	Xylenes (total)	1330-20-7	ID	26	3	2.30E-01	2.00E+01		1.5E+02	1.3E-01	4.6E+04	4.3E-04	2.9E+08	6.9E-08	1.5E+02	1.3E-01	1.5E+02	1.3E-01	5.4E+04	3.7E-04	1.3E+08	1.5E-07	1.5E+02	1.3E-01
PAOC13	INORG	Chromium (total)	7440-47-3		14	14	1.29E-02	3.28E+01						2.6E+02	1.3E-01	2.5E+03	1.3E-02					2.4E+02	1.4E-01	9.2E+03	3.6E-03
PAOC13	INORG	Lead	7439-92-1	B2	14	14	1.23E-02	3.00E+01						1.0E+05	3.0E-04	4.0E+02	7.5E-02					4.4E+04	6.8E-04	9.0E+02	3.3E-02
PAOC13/PAOC19	VOC	2-Butanone	78-93-3	ID	2	2	1.60E-03	1.90E-02		2.7E+04	7.0E-07	2.9E+04	6.6E-07	6.7E+07	2.8E-10	2.7E+04	7.0E-07	2.7E+04	7.0E-07	3.5E+04	5.4E-07	2.9E+07	6.6E-10	2.7E+04	7.0E-07
PAOC13/PAOC19	VOC	Carbon Disulfide	75-15-0		2	2	4.60E-04	5.50E-04		7.6E+01	7.2E-06	1.3E+03	4.2E-07	4.7E+07	1.2E-11	2.8E+02	2.0E-06	1.4E+02	3.9E-06	1.6E+03	3.4E-07	2.1E+07	2.6E-11	2.8E+02	2.0E-06
PAOC13/PAOC19	VOC	cis-1,2-Dichloroethene	156-59-2	ID	2	1	6.10E-04	6.10E-04		2.2E+01	2.8E-05	1.8E+02	3.4E-06	2.3E+06	2.7E-10	6.4E+02	9.5E-07	4.1E+01	1.5E-05	2.1E+02	2.9E-06	1.0E+06	6.1E-10	6.4E+02	9.5E-07
PAOC13/PAOC19	VOC	Trichloroethene	79-01-6	C-B2	2	1	6.70E-04	6.70E-04		7.1E+00	9.4E-05	7.8E+01	8.6E-06	1.8E+06	3.7E-10	5.0E+02	1.3E-06	3.7E+01	1.8E-05	2.6E+02	2.6E-06	2.3E+06	2.9E-10	5.0E+02	1.3E-06
PAOC13/PAOC19	SVOC	Anthracene	120-12-7	D	2	1	6.10E-03	6.10E-03		1.0E+06	6.1E-09	1.4E+06	4.4E-09	6.7E+07	9.1E-11	2.3E+05	2.7E-08	1.0E+06	6.1E-09	1.6E+06	3.8E-09	2.9E+07	2.1E-10	7.3E+05	8.4E-09
PAOC13/PAOC19	SVOC	Benzo(b)fluoranthene	205-99-2	B2	2	1	8.00E-03	8.00E-03								2.0E+01	4.0E-04							8.0E+01	1.0E-04
PAOC13/PAOC19	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	1	4.80E-02	4.80E-02						7.0E+05	6.9E-08	2.8E+03	1.7E-05					8.9E+05	5.4E-08	1.0E+04	4.8E-06
PAOC13/PAOC19	SVOC	Phenanthrene	85-01-8	D	2	1	8.80E-03	8.80E-03		2.8E+03	3.1E-06	1.6E+02	5.5E-05	6.7E+03	1.3E-06	1.6E+03	5.5E-06	5.1E+03	1.7E-06	1.9E+02	4.6E-05	2.9E+03	3.0E-06	5.2E+03	1.7E-06
PAOC13/PAOC19	INORG	Antimony	7440-36-0		2	1	5.20E-02	5.20E-02						1.3E+04	4.0E-06	1.8E+02	2.9E-04					5.9E+03	8.8E-06	6.7E+02	7.8E-05
PAOC13/PAOC19	INORG	Arsenic	7440-38-2	A	2	2	1.70E+00	3.80E+00						7.2E+02	5.3E-03	7.6E+00	5.0E-01					9.1E+02	4.2E-03	3.7E+01	1.0E-01
PAOC13/PAOC19	INORG	Barium	7440-39-3	NC	2	2	1.14E+01	4.51E+01						3.3E+05	1.4E-04	3.7E+04	1.2E-03					1.5E+05	3.0E-04	1.3E+05	3.5E-04
PAOC13/PAOC19	INORG	Beryllium	7440-41-7	B1	2	2	1.70E-01	3.60E-01						1.3E+03	2.8E-04	4.1E+02	8.8E-04					5.9E+02	6.1E-04	1.6E+03	2.3E-04
PAOC13/PAOC19	INORG	Cadmium	7440-43-9	B1	2	2	1.70E-01	3.40E-01						1.7E+03	2.0E-04	5.5E+02	6.2E-04					2.2E+03	1.5E-04	2.1E+03	1.6E-04
PAOC13/PAOC19	INORG	Chromium III	16065-83-1	D	2	2	5.36E+00	1.02E+01						3.3E+05	3.1E-05	7.9E+05	1.3E-05					1.5E+05	6.8E-05	1.0E+06	1.0E-05
PAOC13/PAOC19	INORG	Chromium VI	18540-29-9	A	2	2	6.40E-01	1.30E+00						2.6E+02	5.0E-03	2.5E+03	5.2E-04					2.4E+02	5.4E-03	9.2E+03	1.4E-04
PAOC13/PAOC19	INORG	Cobalt	7440-48-4	LC	2	2	3.10E+00	4.50E+00						1.3E+04	3.5E-04	2.6E+03	1.7E-03					5.9E+03	7.6E-04	9.0E+03	5.0E-04
PAOC13/PAOC19	INORG	Copper	7440-50-8	D	2	2	7.20E+00	8.00E+00						1.3E+05	6.2E-05	2.0E+04	4.0E-04					5.9E+04	1.4E-04	7.3E+04	1.1E-04
PAOC13/PAOC19	INORG	Lead	7439-92-1	B2	2	2	3.80E+00	8.70E+00						1.0E+05	8.7E-05	4.0E+02	2.2E-02					4.4E+04	2.0E-04	9.0E+02	9.7E-03
PAOC13/PAOC19	INORG	Manganese	7439-96-5	D	2	2	1.30E+02	2.25E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC13/PAOC19	INORG	Mercury	7439-97-6	D	2	1	2.30E-02	2.30E-02		4.8E+01	4.8E-04	5.2E+01	4.4E-04	2.0E+04	1.2E-06	1.6E+02	1.4E-04	8.9E+01	2.6E-04	6.2E+01	3.7E-04	8.8E+03	2.6E-06	5.8E+02	4.0E-05
PAOC13/PAOC19	INORG	Nickel	7440-02-0	A	2	2	6.90E+00	8.80E+00						1.3E+04	6.8E-04	4.0E+04	2.2E-04					1.6E+04	5.5E-04	1.5E+05	5.9E-05
PAOC13/PAOC19	INORG	Selenium	7782-49-2	D	2	1	8.50E-01	8.50E-01						1.3E+05	6.5E-06	2.6E+03	3.3E-04					5.9E+04	1.4E-05	9.6E+03	8.9E-05
PAOC13/PAOC19	INORG	Silver	7440-22-4	D	2	2	3.20E-02	4.20E-02						6.7E+03	6.3E-06	2.5E+03	1.7E-05					2.9E+03	1.4E-05	9.0E+03	4.7E-06
PAOC13/PAOC19	INORG	Thallium	7440-28-0			2	1	8.20E-02	8.20E-02							3.5E+01	2.3E-03							1.3E+02	6.3E-04
PAOC13/PAOC19	INORG	Vanadium	7440-62-2			2	2	1.15E+01	1.52E+01							7.5E+02	2.0E-02							5.5E+03	2.8E-03
PAOC13/PAOC19	INORG	Zinc	7440-66-6	ID	2	2	2.43E+01	3.28E+01								1.7E+05	1.9E-04							6.3E+05	5.2E-05
PAOC14	SVOC	Benzo(a)anthracene	56-55-3	B2	13	1	9.40E-03	9.40E-03								2.0E+01	4.7E-04							8.0E+01	1.2E-04
PAOC14	SVOC	Benzo(b)fluoranthene	205-99-2	B2	1	1	1.00E-02	1.00E-02								2.0E+01	5.0E-04							8.0E+01	1.3E-04
PAOC14	SVOC	Chrysene	218-01-9	B2	13	1	9.30E																		

Table 1b: Exceedance Summary for Soil Pontiac Validation Center, Pontiac, Michigan																								
Area	Location	Top Depth (ft)	Bottom Depth (ft)	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Conc to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Conc to Res VSIC	Residential PSIC (mg/kg)	Ratio of Conc to Res PSIC	Residential DCC (mg/kg)	Ratio of Conc to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Conc to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Conc to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Conc to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Conc to Industrial II DCC
Background	BG-06	7	9	03/07/08	INORG	Manganese	7439-96-5	4.11E+03					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
PAOC02	BH-70-08	4	6	03/05/08	VOC	Trichloroethene	79-01-6	8.20E-02	7.1E+00	1.2E-02	7.8E+01	1.1E-03	1.8E+06	4.6E-08	5.0E+02	1.6E-04	3.7E+01	2.2E-03	2.6E+02	3.2E-04	2.3E+06	3.6E-08	5.0E+02	1.6E-04
PAOC02	BH-87-08	7	9	03/06/08	VOC	Trichloroethene	79-01-6	1.40E-01	7.1E+00	2.0E-02	7.8E+01	1.8E-03	1.8E+06	7.8E-08	5.0E+02	2.8E-04	3.7E+01	3.8E-03	2.6E+02	5.4E-04	2.3E+06	6.1E-08	5.0E+02	2.8E-04
PAOC02	BH-PS-7	2	2	04/25/95	INORG	Arsenic	7440-38-2	1.20E+01					7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.2E-01
PAOC02	MW-69-08	18	20	03/12/08	VOC	Tetrachloroethene	127-18-4	7.40E-02	1.1E+01	6.7E-03	1.8E+02	4.1E-04	5.4E+06	1.4E-08	8.8E+01	8.4E-04	6.0E+01	1.2E-03	6.0E+02	1.2E-04	6.8E+06	1.1E-08	8.8E+01	8.4E-04
PAOC02	MW-74-08	0	2	03/14/08	VOC	1,1-Dichloroethene	75-35-4	1.10E-01	6.2E-02	1.8E+00	1.1E+00	1.0E-01	6.2E+04	1.8E-06	2.0E+02	5.5E-04	3.3E-01	3.3E-01	3.7E+00	3.0E-02	7.8E+04	1.4E-06	5.7E+02	1.9E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	1,1-Dichloroethene	75-35-4	2.60E-01	6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	Trichloroethene	79-01-6	7.60E+00	7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02
PAOC04	BH-92-08	7.5	9.5	03/14/08	INORG	Arsenic	7440-38-2	1.21E+01					7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.3E-01
PAOC05	A	14	15	01/18/90	VOC	Benzene	71-43-2	5.20E+00	1.6E+00	3.3E+00	1.3E+01	4.0E-01	3.8E+05	1.4E-05	1.8E+02	2.9E-02	8.4E+00	6.2E-01	4.5E+01	1.2E-01	4.7E+05	1.1E-05	4.0E+02	1.3E-02
PAOC05	BH-36-07	0	2	12/03/07	SVOC	Benzo(a)pyrene	50-32-8	2.60E+00					1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC05	C	14	15	01/18/90	VOC	Benzene	71-43-2	3.10E+00	1.6E+00	1.9E+00	1.3E+01	2.4E-01	3.8E+05	8.2E-06	1.8E+02	1.7E-02	8.4E+00	3.7E-01	4.5E+01	6.9E-02	4.7E+05	1.6E-06	4.0E+02	7.8E-03
PAOC05	F	14	15	01/18/90	VOC	Benzene	71-43-2	8.00E-02	1.6E+00	5.0E-02	1.3E+01	6.2E-03	3.8E+05	2.1E-07	1.8E+02	4.4E-04	8.4E+00	9.5E-03	4.5E+01	1.8E-03	4.7E+05	1.7E-07	4.0E+02	2.0E-04
PAOC05	SB16P3_E_SIDEWALL	5	5	07/06/95	VOC	Benzene	71-43-2	1.50E+00	1.6E+00		9.4E-01	1.3E+01	3.8E+05	3.9E-06	1.8E+02	8.3E-03	8.4E+00	1.8E-01	4.5E+01	3.3E-02	4.7E+05	3.2E-06	4.0E+02	3.8E-03
PAOC05	SB16P3_N_SIDEWALL	4	4	06/30/95	VOC	Benzene	71-43-2	7.70E-02	1.6E+00	4.8E-02	1.3E+01	5.9E-03	3.8E+05	2.0E-07	1.8E+02	4.3E-04	8.4E+00	9.2E-03	4.5E+01	1.7E-03	4.7E+05	1.6E-07	4.0E+02	1.9E-04
PAOC05	SB16P3_N_SIDEWALL~1	5	5	06/30/95	VOC	Toluene	108-88-3	1.40E+01	2.5E+02	5.6E-02	2.8E+03	5.0E-03	2.7E+07	5.2E-07	2.5E+02	5.6E-02	2.5E+02	5.6E-02	3.3E+03	4.2E-03	1.2E+07	1.2E-06	2.5E+02	5.6E-02
PAOC05	SB16P3_N_SIDEWALL~1	5	5	06/30/95	VOC	Xylenes (total)	1330-20-7	6.30E+01	1.5E+02	4.2E-01	4.6E+04	1.4E-03	2.9E+08	2.2E-07	1.5E+02	4.2E-01	1.5E+02	4.2E-01	5.4E+04	1.2E-03	1.3E+08	4.8E-07	1.5E+02	4.2E-01
PAOC05	SB16P3_N_SIDEWALL~2	5	5	07/06/95	VOC	Toluene	108-88-3	2.00E+01	2.5E+02	8.0E-02	2.8E+03	7.1E-03	2.7E+07	7.4E-07	2.5E+02	8.0E-02	2.5E+02	8.0E-02	3.3E+03	6.1E-03	1.2E+07	1.7E-06	2.5E+02	8.0E-02
PAOC05	SB16P3_N_SIDEWALL~2	5	5	07/06/95	VOC	Xylenes (total)	1330-20-7	6.00E+01	1.5E+02	4.0E-01	4.6E+04	1.3E-03	2.9E+08	2.1E-07	1.5E+02	4.0E-01	1.5E+02	4.0E-01	5.4E+04	1.1E-03	1.3E+08	4.6E-07	1.5E+02	4.0E-01
PAOC05	SB16P3_NC_FLOOR	11	11	06/30/95	VOC	Benzene	71-43-2	7.40E-01	1.6E+00	4.6E-01	1.3E+01	5.7E-02	3.8E+05	1.9E-06	1.8E+02	4.1E-03	8.4E+00	8.8E-02	4.5E+01	1.6E-02	4.7E+05	1.6E-06	4.0E+02	1.9E-03
PAOC05	SB16P3_NE_FLOOR	11	11	06/30/95	VOC	Benzene	71-43-2	3.40E+00	1.6E+00	2.1E+00	1.3E+01	2.6E-01	3.8E+05	8.9E-06	1.8E+02	1.9E-02	8.4E+00	4.0E-01	4.5E+01	7.6E-02	4.7E+05	7.2E-06	4.0E+02	8.5E-03
PAOC05	SB16P3_NE_FLOOR~2	11	11	07/05/95	VOC	Benzene	71-43-2	5.00E+00	1.6E+00	3.1E+00	1.3E+01	3.8E-01	3.8E+05	1.3E-05	1.8E+02	2.8E-02	8.4E+00	6.0E-01	4.5E+01	1.1E-01	4.7E+05	1.1E-05	4.0E+02	1.3E-02
PAOC05	SB16P3_NW_FLOOR~1	9	9	06/30/95	VOC	Benzene	71-43-2	9.20E-02	1.6E+00	5.8E-02	1.3E+01	7.1E-03	3.8E+05	2.4E-07	1.8E+02	5.1E-04	8.4E+00	1.1E-02	4.5E+01	2.0E-03	4.7E+05	2.0E-07	4.0E+02	2.3E-04
PAOC05	SB16P3_SE_FLOOR	13	13	06/28/95	VOC	Benzene	71-43-2	6.30E-01	1.6E+00	3.9E-01	1.3E+01	4.8E-02	3.8E+05	1.7E-06	1.8E+02	3.5E-03	8.4E+00	7.5E-02	4.5E+01	1.4E-02	4.7E+05	1.3E-06	4.0E+02	1.6E-03
PAOC05	SB16P3_SFLOOR	8	8	06/28/95	VOC	Benzene	71-43-2	3.50E-01	1.6E+00	2.2E-01	1.3E+01	2.7E-02	3.8E+05	9.2E-07	1.8E+02	1.9E-03	8.4E+00	4.2E-02	4.5E+01	7.8E-03	4.7E+05	7.4E-07	4.0E+02	8.8E-04
PAOC05	SB-N-1	18	20	12/22/93	VOC	Benzene	71-43-2	1.27E+00	1.6E+00	7.9E-01	1.3E+01	9.8E-02	3.8E+05	3.3E-06	1.8E+02	7.1E-03	8.4E+00	1.5E-01	4.5E+01	2.8E-02	4.7E+05	2.7E-06	4.0E+02	3.2E-03
PAOC05	TANK 2	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	1.25E+02	8.7E+01	1.4E+00	7.2E+02	1.7E-01	1.0E+07	1.3E-05	1.4E+02	8.9E-01	1.4E+02	8.9E-01	2.4E+03	5.2E-02	1.3E+07	9.6E-06	1.4E+02	8.9E-01
PAOC05	TANK 2	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	4.50E+02	1.5E+02	3.0E+00	4.6E+04	9.8E-03	2.9E+08	1.6E-06	1.5E+02	3.0E+00	1.5E+02	3.0E+00	5.4E+04	8.3E-03	1.3E+08	3.5E-06	1.5E+02	3.0E+00
PAOC05	TANK 3	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	3.00E+01	8.7E+01	3.4E-01	7.2E+02	4.2E-02	1.0E+07	3.0E-06	1.4E+02	2.1E-01	1.4E+02	2.1E-01	2.4E+03	1.3E-02	1.3E+07	2.3E-06	1.4E+02	2.1E-01
PAOC05	TANK 3	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	1.25E+02	1.5E+02	8.3E-01	4.6E+04	2.7E-03	2.9E+08	4.3E-07	1.5E+02	8.3E-01	1.5E+02	8.3E-01	5.4E+04	2.3E-03	1.3E+08	9.6E-07	1.5E+02	8.3E-01
PAOC05	TANK 5	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	4.00E+01	1.5E+02	2.7E-01	4.6E+04	8.7E-04	2.9E+08	1.4E-07	1.5E+02	2.7E-01	1.5E+02	2.7E-01	5.4E+04	7.4E-04	1.3E+08	3.1E-07	1.5E+02	2.7E-01
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	3.50E+03	8.7E+01	4.0E+01	7.2E+02	4.9E+00	1.0E+07	3.5E-04	1.4E+02	2.5E+01	1.4E+02	2.5E+01	2.4E+03	1.5E+00	1.3E+07	2.7E-04	1.4E+02	2.5E+01
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Toluene	108-88-3	8.50E+02	2.5E+02	3.4E+00	2.8E+03	3.0E-01	2.7E+07	3.1E-05	2.5E+02	3.4E+00	2.5E+02	3.4E+00	3.3E+03	2.6E-01	1.2E+07	7.1E-05	2.5E+02	3.4E+00
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	2.30E+04	1.5E+02	1.5E+02	4.6E+04	5.0E-01	2.9E+08	7.9E-05	1.5E+02	1.5E+02	1.5E+02	1.5E+02	5.4E+04	4.3E-01	1.3E+08	1.8E-04	1.5E+02	1.5E+02
PAOC05	WB16P3_SIDEWALL~12	5	5	08/11/95	VOC	Benzene	71-43-2	2.90E+00	1.6E+00	1.8E+00	1.3E+01	2.2E-01	3.8E+05	7.6E-06	1.8E+02	1.6E-02	8.4E+00	3.5E-01	4.5E+01	6.4E-02	4.7E+05	6.2E-06	4.0E+02	7.3E-03
PAOC05	WB16P3_SIDEWALL~9	5	5	08/08/95	VOC	Benzene	71-43-2	2.30E+00	1.6E+00	1.4E+00	1.3E+01	1.8E-01	3.8E+05	6.1E-06	1.8E+02	1.3E-02	8.4E+00	2.7E-01	4.5E+01	5.1E-02	4.7E+05	4.9E-06	4.0E+02	5.8E-03
PAOC06	BH-47-07	17.5	20	10/09/07	INORG	Arsenic	7440-38-2	1.11E+01					7.2E+02	1.5E-02	7.6E+00	1.5E+00					9.1E+02	1.2E-02	3.7E+01	3.0E-01
PAOC06	BH-80-08	4	6	03/05/08	SVOC	2,6-Dinitrotoluene	606-20-2	1.50E-01																
PAOC09	BH-77-08	8	10	03/11/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.30E-01	2.2E+01	3.3E-02	1.8E+02	4.1E-03	2.3E+06	3.2E-07	6.4E+02	1.1E-03	4.1E+01	1.8E-02	2.1E+02	3.5E-03	1.0E+06	7.3E-07	6.4E+02	1.1E-03
PAOC09	BH-77-08	8	10	03/11/08	VOC	Trichloroethene	79-01-6	2.20E-01	7.1E+00	3.1E-02	7.8E+01	2.8E-03	1.8E+06	1.2E-07	5.0E+02	4.4E-04	3.7E+01	5.9E-03	2.6E+02	8.5E-04	2.3E+06	9.6E-08	5.0E+02	4.4E-04
PAOC09	BH-77-08	8	10	03/11/08	VOC	Trichloroethene	79-01-6	1.20E-01	7.1E+00	1.7E-02	7.8E+01	1.5E-03	1.8E+06	6.7E-08	5.0E+02	2.4E-04	3.7E+01	3.2E-03	2.6E+02	4.6E-04	2.3E+06	5.2E-08	5.0E+02	2.4E-04
PAOC09	BH-77-08	8	10	03/11/08	VOC	Vinyl Chloride	75-01-4	6.60E-02	2.7E-01	2.4E-01	4.2E+00	1.6E-02	3.5E+05	1.9E-07	3.8E+00	1.7E-02	2.8E+00	2.4E-02	2.9E+01	2.3E-03	8.9E+05	7.4E-08	3.4E+01	1.9E-03
PAOC09	BH-77-08	8	10	03/11/08	VOC	Vinyl Chloride	75-01-4	4.50E-02	2.7E-01	1.7E-01	4.2E+00	1.1E-02	3.5E+05	1.3E-07	3.8E+00	1.2E-02	2.8E+00	1.6E-02	2.9E+01	1.6E-03	8.9E+05	5.1E-08	3.4E+01	1.3E-03
PAOC11	BH-14-07	0	2	10/16/07	INORG	Antimony	7440-36-0	5.50E+00					1.3E+04	4.2E-04	1.8E+02	3.1E-02								

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	VOC	2-Butanone	78-93-3	ID	5	1	2.50E-03	2.50E-03	1.3E+01	1.9E-04	3.8E+01	6.6E-05	2.4E+05	1.0E-08	2.4E+05	1.0E-08	2.4E+05	1.0E-08
PAOC01	VOC	1,3-Dichlorobenzene	541-73-1	D	5	3	1.80E-04	2.90E-04	6.6E-03	4.4E-02	1.9E-02	1.5E-02					2.0E+00	1.5E-04
PAOC01	VOC	1,4-Dichlorobenzene	106-46-7	C	5	2	3.00E-04	4.80E-04	7.5E-02	6.4E-03	7.5E-02	6.4E-03	1.6E+01	3.0E-05	7.4E+01	6.5E-06	6.4E+00	7.5E-05
PAOC01	VOC	cis-1,2-Dichloroethene	156-59-2	ID	5	1	8.80E-03	8.80E-03	7.0E-02	1.3E-01	7.0E-02	1.3E-01	9.3E+01	9.5E-05	2.1E+02	4.2E-05	2.0E+02	4.4E-05
PAOC01	VOC	trans-1,2-Dichloroethene	156-60-5		5	1	2.90E-03	2.90E-03	1.0E-01	2.9E-02	1.0E-01	2.9E-02	8.5E+01	3.4E-05	2.0E+02	1.5E-05	2.2E+02	1.3E-05
PAOC01	VOC	4-Methyl-2-pentanone	108-10-1	ID	5	1	3.20E-03	3.20E-03	1.8E+00	1.8E-03	5.2E+00	6.2E-04	2.0E+04	1.6E-07	2.0E+04	1.6E-07	1.3E+04	2.5E-07
PAOC01	VOC	Trichloroethene	79-01-6	C-B2	5	1	5.10E-02	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	PCB	PCBs (total)	1336-36-3	B2	5	1	6.20E-04	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	INORG	Aluminum	7429-90-5	ID	5	4	1.16E-02	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	INORG	Barium	7440-39-3	NC	5	5	1.20E-02	3.94E-01	2.0E+00	2.0E-01	2.0E+00	2.0E-01					1.4E+04	2.8E-05
PAOC01	INORG	Cadmium	7440-43-9	B1	5	1	7.10E-04	7.10E-04	5.0E-03	1.4E-01	5.0E-03	1.4E-01					1.9E+02	3.7E-06
PAOC01	INORG	Chromium III	16065-83-1	D	5	5	2.50E-03	2.60E-03	3.8E+01	6.8E-05	1.1E+02	2.4E-05					2.9E+05	9.0E-09
PAOC01	INORG	Cobalt	7440-48-4	LC	5	2	2.10E-03	2.50E-03	4.0E-02	6.3E-02	1.0E-01	2.5E-02					2.4E+03	1.0E-06
PAOC01	INORG	Iron	7439-89-6	D	5	5	8.71E-02	1.81E+00	2.0E+00	9.1E-01	5.6E+00	3.2E-01					5.8E+04	3.1E-05
PAOC01	INORG	Manganese	7439-96-5	D	5	5	1.45E-02	2.15E+00	8.6E-01	2.5E+00	8.6E-01						9.1E+03	2.4E-04
PAOC01	INORG	Nickel	7440-02-0	A	5	3	3.50E-03	6.70E-03	1.0E-01	6.7E-02	1.0E-01	6.7E-02					7.4E+04	9.1E-08
PAOC01	INORG	Vanadium	7440-62-2		5	1	3.20E-03	3.20E-03	4.5E-03	7.1E-01	6.2E-02	5.2E-02					9.7E+02	3.3E-06
PAOC01	INORG	Zinc	7440-66-6	ID	5	4	5.80E-03	1.05E-02	2.4E+00	4.4E-03	5.0E+00	2.1E-03					1.1E+05	9.5E-08
PAOC02	VOC	Acetone	67-64-1	ID	9	1	1.80E-01	1.80E-01	7.3E-01	2.5E-01	2.1E+00	8.6E-02	1.0E+06	1.8E-07	1.0E+06	1.8E-07	3.1E+04	5.8E-06
PAOC02	VOC	2-Butanone	78-93-3	ID	9	2	7.40E-04	3.60E-02	1.3E+01	2.8E-03	3.8E+01	9.5E-04	2.4E+05	1.5E-07	2.4E+05	1.5E-07	2.4E+05	1.5E-07
PAOC02	VOC	Chloroform	67-66-3	B2	9	2	2.30E-04	1.70E-02	8.0E-02	2.1E-01	8.0E-02	2.1E-01	2.8E+01	6.1E-04	1.8E+02	9.4E-05	1.5E+02	1.1E-04
PAOC02	VOC	1,1-Dichloroethane	75-34-3	SC	9	1	2.30E-01	2.30E-01	8.8E-01	2.6E-01	2.5E+00	9.2E-02	1.0E+03	2.3E-04	2.3E+03	1.0E-04	2.4E+03	9.6E-05
PAOC02	VOC	1,1-Dichloroethene	75-35-4	C	9	4	4.70E-04	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	VOC	cis-1,2-Dichloroethene	156-59-2	ID	9	1	7.60E-02	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	VOC	2-Hexanone	591-78-6		9	1	3.80E-03	3.80E-03	1.0E+00	3.8E-03	2.9E+00	1.3E-03	4.2E+03	9.0E-07	8.7E+03	4.4E-07	5.2E+03	7.3E-07
PAOC02	VOC	4-Methyl-2-pentanone	108-10-1	ID	9	2	7.90E-04	7.60E-03	1.8E+00	4.2E-03	5.2E+00	1.5E-03	2.0E+04	3.8E-07	2.0E+04	3.8E-07	1.3E+04	5.8E-07
PAOC02	VOC	Toluene	108-88-3	ID	9	1	2.40E-04	2.40E-04	1.0E+00	2.4E-04	1.0E+00	2.4E-04	5.3E+02	4.5E-07	5.3E+02	4.5E-07	5.3E+02	4.5E-07
PAOC02	VOC	1,1,1-Trichloroethane	71-55-6	ID	9	1	1.00E+00	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	VOC	Trichloroethene	79-01-6	C-B2	9	1	2.10E+00	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	VOC	Trichlorofluoromethane	75-69-4		9	1	2.20E-04	2.20E-04	2.6E+00	8.5E-05	7.3E+00	3.0E-05	1.1E+03	2.0E-07	1.1E+03	2.0E-07	1.1E+03	2.0E-07
PAOC02	SVOC	Acenaphthene	83-32-9		8	1	6.60E-04	6.60E-04	1.3E+00	5.1E-04	3.8E+00	1.7E-04	4.2E+00	1.6E-04	4.2E+00	1.6E-04	4.2E+00	1.6E-04
PAOC02	SVOC	Anthracene	120-12-7	D	8	1	1.30E-03	1.30E-03	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02
PAOC02	SVOC	Benzo(a)anthracene	56-55-3	B2	8	2	3.50E-04	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	SVOC	Benzo(a)pyrene	50-32-8	B2	8	2	3.00E-04	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	SVOC	Benzo(b)fluoranthene	205-99-2	B2	8	2	3.50E-04	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	SVOC	Benzo(g,h,i)perylene	191-24-2	D	8	1	2.20E-03	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	SVOC	Benzo(k)fluoranthene	207-08-9	B2	8	1	1.70E-03	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	8	3	9.00E-04	9.70E-04	6.0E-03	1.6E-01	6.0E-03	1.6E-01					3.2E-01	3.0E-03
PAOC02	SVOC	Carbazole	86-74-8	B2	8	1	9.70E-04	9.70E-04	8.5E-02	1.1E-02	3.5E-01	2.8E-03					7.4E+00	1.3E-04
PAOC02	SVOC	Chrysene	218-01-9	B2	8	2	3.20E-04	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	8	1	6.10E-04	6.10E-04	2.0E-03	3.1E-01	2.0E-03	3.1E-01					2.0E-03	3.1E-01
PAOC02	SVOC	Di-n-butylphthalate	84-74-2	D	8	1	7.30E-04	7.30E-04	8.8E-01	8.3E-04	2.5E+00	2.9E-04					1.1E+01	6.6E-05
PAOC02	SVOC	Fluoranthene	206-44-0	D	8	3	2.40E-04	8.40E-03	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02
PAOC02	SVOC	Fluorene	86-73-7	D	8	1	7.20E-04	7.20E-04	8.8E-01	8.2E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04
PAOC02	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	8	1	2.00E-03	2.00E-03	2.0E-03	1.0E+00	2.0E-03	1.0E+00					2.0E-03	1.0E+00
PAOC02	SVOC	Phenanthrene	85-01-8	D	8	2	5.90E-04	5.80E-03	5.2E-02	1.1E-01	1.5E-01	3.9E-02	1.0E+00	5.8E-03	1.0E+00	5.8E-03	1.0E+00	5.8E-03
PAOC02	SVOC	Pyrene	129-00-0	NC	8	2	5.90E-04	6.30E-03	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02
PAOC02	INORG	Aluminum	7429-90-5	ID	8	8	2.25E-02	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	INORG	Antimony	7440-36-0		8	6	1.70E-04	1.70E-03	6.0E-03	2.8E-01	6.0E-03	2.8E-01					6.8E+01	2.5E-05
PAOC02	INORG	Barium	7440-39-3	NC	8	8	8.10E-03	2.99E-01	2.0E+00	1.5E-01	2.0E+00	1.5E-01					1.4E+04	2.1E-05
PAOC02	INORG	Chromium III	16065-83-1	D	8	4	1.40E-03	5.10E-03	3.8E+01	1.3E-04	1.1E+02	4.6E-05					2.9E+05	1.8E-08
PAOC02	INORG	Cobalt	7440-48-4	LC	8	1	1.33E-02	1.33E-02	4.0E-02	3.3E-01	1.0E-01	1.3E-01					2.4E+03	5.5E-06
PAOC02	INORG	Copper	7440-50-8	D	8	1	4.10E-03	4.10E-03	1.4E+00	2.9E-03	4.0E+00	1.0E-03					7.4E+03	5.5E-07
PAOC02	INORG	Cyanide (amenable)	57-12-5A		8	2	1.40E-02	2.00E-02										
PAOC02	INORG	Iron	7439-89-6	D	8	8	1.66E-01	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	INORG	Lead	7439-92-1	B2	8	2	2.50E-03	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC02	INORG	Manganese	7439-96-5	D	8	8	1.08E-02	5.95E-01	8.6E-01	6.9E-01	2.5E+00	2.4E-01					9.1E+03	6.5E-05
PAOC02	INORG	Mercury	7439-97-6	D	8	2	1.20E-04	1.20E-04	2.0E-03	6.0E-02	2.0E-03	6.0E-02	5.6E-02	2.1E-03	5.6E-02	2.1E-03	5.6E-02	2.1E-03
PAOC02	INORG	Nickel	7440-02-0	A	8	1	8.60E-03	8.60E-03	1.0E-01	8.6E-02	1.0E-01	8.6E-02					7.4E+04	1.2E-07
PAOC02	INORG	Selenium	7782-49-2	D	8	2	4.50E-03	5.40E-03	5.0E-02	1.1E-01	5.0E-02	1.1E-01					9.7E+02	5.6E-06
PAOC02	INORG	Vanadium	7440-62-2		8	3	1.00E-03	3.30E-03	4.5E-03	7.3E-01	6.2E-02	5.3E-02					9.7E+02	3.4E-06
PAOC02	INORG	Zinc	7440-66-6	ID	8	2	7.20E-03	3.14E-02	2.4E+00	1.3E-02	5.0E+00	6.3E-03					1.1E+05	2.9E-07
PAOC03	VOC	Toluene	108-88-3	ID	3	1	5.40E-04	5.40E-04	1.0E+00	5.4E-04	1.0E+00	5.4E-04	5.3E+02	1.0E-06	5.3E+02	1.0E-06	5.3E+02	1.0E-06
PAOC03	PCB	PCBs (total)	1336-36-3	B2	2	1	1.05E-04	1.05E-04	5.0E-04	2.1E-01	5.0E-04	2.1E-01	4.5E-02	2.3E-03	4.5E-02	2.3E-03	3.3E-03	3.2E-02
PAOC03	INORG	Aluminum	7429-90-5	ID	3	3	1.48E-01	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	INORG	Antimony	7440-36-0		3	3	1.40E-04	1.30E-03	6.0E-03	2.2E-01	6.0E-03	2.2E-01					6.8E+01	1.9E-05
PAOC03	INORG	Arsenic	7440-38-2	A	3	1	5.90E-03	5.90E-03	1.0E-02	5.9E-01	1.0E-02	5.9E-01					4.3E+00	1.4E-03
PAOC03	INORG	Barium	7440-39-3	NC	3	3	9.70E-03	1.19E-01	2.0E+00	6.0E-02	2.0E+00	6.0E-02					1.4E+04	8.5E-06
PAOC03	INORG	Chromium III	16065-83-1	D	2	2	5.00E-04	5.00E-04	3.8E+01	1.3E-05	1.1E+02	4.5E-06					2.9E+05	1.7E-09
PAOC03	INORG	Chromium VI	18540-29-9	A	2	2	6.00E-03	1.00E-02	1.0E-01	1.0E-01	1.0E-01	1.0E-01					4.6E+02	2.2E-05
PAOC03	INORG	Copper	7440-50-8	D	3	3	3.90E-03	6.30E-03	1.4E+00	4.5E-03	4.0E+00	1.6E-03					7.4E+03	8.5E-07
PAOC03	INORG	Iron	7439-89-6	D	3	3	3.46E-01	1.03E+00	2.0E+00	5.2E-01	5.6E+00	1.8E-01					5.8E+04	1.8E-05
PAOC03	INORG	Lead	7439-92-1	B2	3	1	5.60E-03	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	INORG	Manganese	7439-96-5	D	3	3	1.51E-02	2.54E-01	8.6E-01	3.0E-01	2.5E+00	1.0E-01					9.1E+03	2.8E-05
PAOC03	INORG	Nickel	7440-02-0	A	3	1	9.40E-03	9.40E-03	1.0E-01	9.4E-02	1.0E-01	9.4E-02					7.4E+04	1.3E-07
PAOC03	INORG	Vanadium	7440-62-2		3	2	3.30E-03	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC03	INORG	Zinc	7440-66-6	ID	3	2	1.62E-02	2.15E-02	2.4E+00	9.0E-03	5.0E+00	4.3E-03					1.1E+05	2.0E-07
PAOC05	VOC	Benzene	71-43-2	A	25	13	5.00E-04	1.40E+01	5.0E-03	2.8E+03	5.0E-03	2.8E+03	5.6E+00	2.5E+00	3.5E+01	4.0E-01	1.1E+01	1.3E+00
PAOC05	VOC	2-Butanone	78-93-3	ID	5	2	2.70E-03	7.00E-03	1.3E+01	5.4E-04	3.8E+01	1.8E-04	2.4E+05	2.9E-08	2.4E+05	2.9E-08	2.4E+05	2.9E-08
PAOC05	VOC	Carbon Disulfide	75-15-0		5	1	3.60E-04	3.60E-04	8.0E-01	4.5E-04	2.3E+00	1.6E-04	2.5E+02	1.4E-06	5.5E+02	6.5E-07	1.2E+03	3.0E-07
PAOC05	VOC	Chloroethane	75-00-3	LC	9	1	5.90E-04	5.90E-04	4.3E-01	1.4E-03	1.7E+00	3.5E-04	5.7E+03	1.0E-07	5.7E+03	1.0E-07	4.4E+02	1.3E-06
PAOC05	VOC	1,1-Dichloroethane	75-34-3	SC	9	1	2.00E-03	2.00E-03	8.8E-01	2.3E-03	2.5E+00	8.0E-04	1.0E+03	2.0E-06	2.3E+03	8.7E-07	2.4E+03	8.3E-07
PAOC05	VOC	1,1-Dichloroethene	75-35-4	C	9	2	9.20E-04	1.20E-03	7.0E-03	1.7E-01	7.0E-03	1.7E-01	2.0E-01	6.0E-03	1.3E+00	9.2E-04	1.1E+01	1.1E-04
PAOC05	VOC	trans-1,2-Dichloroethene	156-60-5		9	2	1.40E-02	1.60E-02	1.0E-01	1.6E-01	1.0E-01	1.6E-01	8.5E+01	1.9E-04	2.0E+02	8.0E-05	2.2E+02	7.3E-05
PAOC05	VOC	Ethyl Benzene	100-41-4	D	25	9	4.50E-03	2.10E+00	7.0E-01	3.0E+00	7.0E-01	3.0E+00	1.1E+02	1.9E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	VOC	Methyl tert-butyl ether	1634-04-4		5	1	2.30E-04	2.30E-04	2.4E-01	9.6E-04	6.9E-01	3.3E-04	4.7E+04	4.9E-09	4.7E+04	4.9E-09	6.1E+02	3.8E-07
PAOC05	VOC	Tetrachloroethene	127-18-4	C-B2	9	1	1.30E-03	1.30E-03	5.0E-03	2.6E-01	5.0E-03	2.6E-01	2.5E+01	5.2E-05	1.7E+02	7.6E-06	1.2E+01	1.1E-04
PAOC05	VOC	Toluene	108-88-3	ID	25	10	1.80E-03	2.20E+01	1.0E+00	2.2E+01	1.0E+00	2.2E+01	5.3E+02	4.2E-02	5.3E+02	4.2E-02	5.3E+02	4.2E-02
PAOC05	VOC	1,1,1-Trichloroethane	71-55-6	ID	9	2	1.10E-03	3.60E-03	2.0E-01	1.8E-02	2.0E-01	1.8E-02	6.6E+02	5.5E-06	1.3E+03	2.8E-06	1.3E+03	2.8E-06
PAOC05	VOC	Trichloroethene	79-01-6	C-B2	9	1	2.40E-03	2.40E-03	5.0E-03	4.8E-01	5.0E-03	4.8E-01	1.5E+01	1.6E-04	9.7E+01	2.5E-05	2.2E+01	1.1E-04
PAOC05	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	5	1	8.50E-04	8.50E-04	1.0E+00	8.5E-04	2.9E+00	2.9E-04	5.6E+01	1.5E-05	5.6E+01	1.5E-05	5.6E+01	1.5E-05
PAOC05	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	5	1	2.90E-04	2.90E-04	1.0E+00	2.9E-04	2.9E+00	1.0E-04	6.1E+01	4.8E-06	6.1E+01	4.8E-06	6.1E+01	4.8E-06
PAOC05	VOC	Vinyl Chloride	75-01-4	A	9	3	1.60E-03	7.50E-02	2.0E-03	3.8E+01	2.0E-03	3.8E+01	1.1E+00	6.8E-02	1.3E+01	5.8E-03	1.0E+00	7.5E-02
PAOC05	VOC	Xylenes (total)	1330-20-7	ID	21	7	1.40E-02	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	SVOC	Acetophenone	98-86-2	D	5	1	5.50E-04	5.50E-04	1.5E+00	3.7E-04	4.4E+00	1.3E-04	6.1E+03	9.0E-08	6.1E+03	9.0E-08	6.1E+03	9.0E-08
PAOC05	SVOC	Benzo(a)anthracene	56-55-3	B2	5	1	7.30E-04	7.30E-04	2.1E-03	3.5E-01	8.5E-03	8.6E-02					9.4E-03	7.8E-02
PAOC05	SVOC	Benzo(a)pyrene	50-32-8	B2	5	1	6.40E-04	6.40E-04	5.0E-03	1.3E-01	5.0E-03	1.3E-01					1.0E-03	6.4E-01
PAOC05	SVOC	Benzo(b)fluoranthene	205-99-2	B2	5	1	1.20E-03	1.20E-03	1.5E-03	8.0E-01	1.5E-03	8.0E-01					1.5E-03	8.0E-01
PAOC05	SVOC	Benzo(g,h,i)perylene	191-24-2	D	5	1	5.70E-04	5.70E-04	1.0E-03	5.7E-01	1.0E-03	5.7E-01					1.0E-03	5.7E-01
PAOC05	SVOC	Benzo(k)fluoranthene	207-08-9	B2	5	1	3.80E-04	3.80E-04	1.0E-03	3.8E-01	1.0E-03	3.8E-01					1.0E-03	3.8E-01
PAOC05	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	5	2	1.50E-03	2.10E-03	6.0E-03	3.5E-01	6.0E-03	3.5E-01					3.2E-01	6.6E-03
PAOC05	SVOC	Chrysene	218-01-9	B2	5	1	9.40E-04	9.40E-04	1.6E-03	5.9E-01	1.6E-03	5.9E-01					1.6E-03	5.9E-01
PAOC05	SVOC	Fluoranthene	206-44-0	D	5	1	2.50E-03	2.50E-03	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02
PAOC05	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	5	1	4.90E-04	4.90E-04	2.0E-03	2.5E-01	2.0E-03	2.5E-01					2.0E-03	2.5E-01
PAOC05	SVOC	2-Methylnaphthalene	91-57-6	ID	5	1	3.80E-04	3.80E-04	2.6E-01	1.5E-03	7.5E-01	5.1E-04					2.5E+01	1.5E-05
PAOC05	SVOC	Naphthalene	91-20-3	C	5	1	9.20E-04	9.20E-04	5.2E-01	1.8E-03	1.5E+00	6.1E-04	3.1E+01	3.0E-05	3.1E+01	3.0E-05	3.1E+01	3.0E-05
PAOC05	SVOC	Phenanthrene	85-01-8	D	5	1	8.70E-04	8.70E-04	5.2E-02	1.7E-02	1.5E-01	5.8E-03	1.0E+00	8.7E-04	1.0E+00	8.7E-04	1.0E+00	8.7E-04
PAOC05	SVOC	Pyrene	129-00-0	NC	5	1	1.70E-03	1.70E-03	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02
PAOC05	PCB	PCBs (total)	1336-36-3	B2	5	1	7.15E-05	7.15E-05	5.0E-04	1.4E-01	5.0E-04	1.4E-01	4.5E-02	1.6E-03	4.5E-02	1.6E-03	3.3E-03	2.2E-02
PAOC05	INORG	Aluminum	7429-90-5	ID	5	5	1.98E-02	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	INORG	Antimony	7440-36-0		5	2	1.00E-03	1.90E-03	6.0E-03	3.2E-01	6.0E-03	3.2E-01					6.8E+01	2.8E-05
PAOC05	INORG	Arsenic	7440-38-2	A	5	1	9.20E-03	9.20E-03	1.0E-02	9.2E-01	1.0E-02	9.2E-01					4.3E+00	2.1E-03

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC05	INORG	Barium	7440-39-3	NC	5	5	9.50E-02	4.48E-01	2.0E+00	2.2E-01	2.0E+00	2.2E-01					1.4E+04	3.2E-05
PAOC05	INORG	Chromium III	16065-83-1	D	5	5	2.50E-03	1.14E-02	3.8E+01	3.0E-04	1.1E+02	1.0E-04					2.9E+05	3.9E-08
PAOC05	INORG	Chromium VI	18540-29-9	A	5	1	3.00E-02	3.00E-02	1.0E-01	3.0E-01	1.0E-01	3.0E-01					4.6E+02	6.5E-05
PAOC05	INORG	Copper	7440-50-8	D	5	1	7.50E-03	7.50E-03	1.4E+00	5.4E-03	4.0E+00	1.9E-03					7.4E+03	1.0E-06
PAOC05	INORG	Iron	7439-89-6	D	5	4	8.25E-02	5.75E-01	2.0E+00	2.9E-01	5.6E+00	1.0E-01					5.8E+04	9.9E-06
PAOC05	INORG	Manganese	7439-96-5	D	5	5	2.50E-03	2.33E-01	8.6E-01	2.7E-01	2.5E+00	9.3E-02					9.1E+03	2.6E-05
PAOC05	INORG	Nickel	7440-02-0	A	5	3	3.20E-03	5.50E-03	1.0E-01	5.5E-02	1.0E-01	5.5E-02					7.4E+04	7.4E-08
PAOC05	INORG	Vanadium	7440-62-2		5	3	1.80E-03	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC10	VOC	Benzene	71-43-2	A	1	1	2.20E-04	2.20E-04	5.0E-03	4.4E-02	5.0E-03	4.4E-02	5.6E+00	3.9E-05	3.5E+01	6.3E-06	1.1E+01	2.0E-05
PAOC10	VOC	Toluene	108-88-3	ID	1	1	8.80E-04	8.80E-04	1.0E+00	8.8E-04	1.0E+00	8.8E-04	5.3E+02	1.7E-06	5.3E+02	1.7E-06	5.3E+02	1.7E-06
PAOC10	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	1	1	2.20E-04	2.20E-04	1.0E+00	2.2E-04	2.9E+00	7.6E-05	5.6E+01	3.9E-06	5.6E+01	3.9E-06	5.6E+01	3.9E-06
PAOC10	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	2	1.40E-03	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	SVOC	Fluoranthene	206-44-0	D	2	1	2.30E-04	2.30E-04	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03
PAOC10	SVOC	Phenanthrene	85-01-8	D	2	1	2.20E-04	2.20E-04	5.2E-02	4.2E-03	1.5E-01	1.5E-03	1.0E+00	2.2E-04	1.0E+00	2.2E-04	1.0E+00	2.2E-04
PAOC10	INORG	Aluminum	7429-90-5	ID	1	1	9.27E-01	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	INORG	Antimony	7440-36-0		1	1	8.00E-04	8.00E-04	6.0E-03	1.3E-01	6.0E-03	1.3E-01					6.8E+01	1.2E-05
PAOC10	INORG	Arsenic	7440-38-2	A	1	1	4.93E-02	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	INORG	Barium	7440-39-3	NC	1	1	4.60E-02	4.60E-02	2.0E+00	2.3E-02	2.0E+00	2.3E-02					1.4E+04	3.3E-06
PAOC10	INORG	Chromium III	16065-83-1	D	1	1			3.8E+01		1.1E+02						2.9E+05	
PAOC10	INORG	Chromium VI	18540-29-9	A	1	1	8.00E-03	8.00E-03	1.0E-01	8.0E-02	1.0E-01	8.0E-02					4.6E+02	1.7E-05
PAOC10	INORG	Copper	7440-50-8	D	1	1	7.20E-03	7.20E-03	1.4E+00	5.1E-03	4.0E+00	1.8E-03					7.4E+03	9.7E-07
PAOC10	INORG	Iron	7439-89-6	D	1	1	7.67E-01	7.67E-01	2.0E+00	3.8E-01	5.6E+00	1.4E-01					5.8E+04	1.3E-05
PAOC10	INORG	Manganese	7439-96-5	D	1	1	1.11E-02	1.11E-02	8.6E-01	1.3E-02	2.5E+00	4.4E-03					9.1E+03	1.2E-06
PAOC10	INORG	Nickel	7440-02-0	A	1	1	3.30E-03	3.30E-03	1.0E-01	3.3E-02	1.0E-01	3.3E-02					7.4E+04	4.5E-08
PAOC10	INORG	Vanadium	7440-62-2		1	1	4.88E-02	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
PAOC11/PAOC14	VOC	1,3-Dichlorobenzene	541-73-1	D	2	2	2.10E-04	2.20E-04	6.6E-03	3.3E-02	1.9E-02	1.2E-02					2.0E+00	1.1E-04
PAOC11/PAOC14	INORG	Aluminum	7429-90-5	ID	2	1	9.80E-03	9.80E-03	3.0E-01	3.3E-02	4.1E+00	2.4E-03					6.4E+04	1.5E-07
PAOC11/PAOC14	INORG	Barium	7440-39-3	NC	2	2	2.96E-01	3.10E-01	2.0E+00	1.6E-01	2.0E+00	1.6E-01					1.4E+04	2.2E-05
PAOC11/PAOC14	INORG	Chromium III	16065-83-1	D	2	2	2.50E-03	2.50E-03	3.8E+01	6.6E-05	1.1E+02	2.3E-05					2.9E+05	8.6E-09
PAOC11/PAOC14	INORG	Cyanide (amenable)	57-12-5A		2	1	7.10E-03	7.10E-03										
PAOC11/PAOC14	INORG	Manganese	7439-96-5	D	2	2	1.14E-01	1.21E-01	8.6E-01	1.4E-01	2.5E+00	4.8E-02					9.1E+03	1.3E-05
PAOC13/PAOC19	VOC	Acetone	67-64-1	ID	1	1	7.90E-02	7.90E-02	7.3E-01	1.1E-01	2.1E+00	3.8E-02	1.0E+06	7.9E-08	1.0E+06	7.9E-08	3.1E+04	2.5E-06
PAOC13/PAOC19	VOC	2-Butanone	78-93-3	ID	1	1	1.40E-02	1.40E-02	1.3E+01	1.1E-03	3.8E+01	3.7E-04	2.4E+05	5.8E-08	2.4E+05	5.8E-08	2.4E+05	5.8E-08
PAOC13/PAOC19	VOC	Carbon Disulfide	75-15-0		1	1	1.80E-03	1.80E-03	8.0E-01	2.3E-03	2.3E+00	7.8E-04	2.5E+02	7.2E-06	5.5E+02	3.3E-06	1.2E+03	1.5E-06
PAOC13/PAOC19	VOC	cis-1,2-Dichloroethene	156-59-2	ID	1	1	6.00E-04	6.00E-04	7.0E-02	8.6E-03	7.0E-02	8.6E-03	9.3E+01	6.5E-06	2.1E+02	2.9E-06	2.0E+02	3.0E-06
PAOC13/PAOC19	VOC	4-Methyl-2-pentanone	108-10-1	ID	1	1	3.00E-03	3.00E-03	1.8E+00	1.7E-03	5.2E+00	5.8E-04	2.0E+04	1.5E-07	2.0E+04	1.5E-07	1.3E+04	2.3E-07
PAOC13/PAOC19	VOC	Toluene	108-88-3	ID	1	1	5.80E-04	5.80E-04	1.0E+00	5.8E-04	1.0E+00	5.8E-04	5.3E+02	1.1E-06	5.3E+02	1.1E-06	5.3E+02	1.1E-06
PAOC13/PAOC19	VOC	Vinyl Chloride	75-01-4	A	1	1	7.90E-04	7.90E-04	2.0E-03	4.0E-01	2.0E-03	4.0E-01	1.1E+00	7.2E-04	1.3E+01	6.1E-05	1.0E+00	7.9E-04
Notes:																		
Only constituents detected in each area are shown.																		
The drinking water criteria are based on the following hierarchy: State MCL, Federal MCL, Region 9 Tap Water Ingestion Criteria at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.																		
The criteria for non-drinking water are the lower of the criteria at either the target cancer risk of 1E-5 or target hazard quotient of 1.																		
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																		
The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).																		
Ratios of concentration to the criteria greater than 1 are shaded in bold.																		
SM - The criterion is the State MCL.																		
C - The criterion is based on cancer risk at a target cancer risk of 1E-5.																		
NC - The criterion is based on noncancer effects at a hazard quotient of 1.																		
Chem Group - chemical group																		
Carc Class - USEPA Weight-of-Evidence Cancer Classification																		
DWC - MDEQ Drinking Water Criteria																		
GCC - MDEQ Groundwater Contact Criteria																		
GVIIC - MDEQ Groundwater Volatilization to Indoor Air Inhalation Criteria																		

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	MW-11-07	11/27/07	INORG	Aluminum	7429-90-5	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	MW-19-07	11/27/07	INORG	Aluminum	7429-90-5	4.63E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC01	MW-2-07	11/28/07	VOC	Trichloroethene	79-01-6	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	MW-2-07	11/28/07	PCB	PCBs (total)	1336-36-3	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	MW-2-07	11/28/07	INORG	Manganese	7439-96-5	2.15E+00	8.6E-01	2.5E+00	2.5E+00	8.6E-01					9.1E+03	2.4E-04
PAOC02	MW-32-07	01/09/08	INORG	Aluminum	7429-90-5	3.25E-01	3.0E-01	1.1E+00	4.1E+00	7.9E-02					6.4E+04	5.1E-06
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.67E+00	2.0E+00	3.8E+00	5.6E+00	1.4E+00					5.8E+04	1.3E-04
PAOC02	MW-63-08	04/07/08	INORG	Lead	7439-92-1	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						
PAOC02	MW-68-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.00E-04	5.0E-03	6.0E-02	5.0E-03	6.0E-02					1.0E-03	3.0E-01
PAOC02	MW-68-08	04/07/08	INORG	Aluminum	7429-90-5	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	MW-74-08	04/07/08	VOC	1,1-Dichloroethene	75-35-4	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	MW-74-08	04/07/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	MW-74-08	04/07/08	VOC	1,1,1-Trichloroethane	71-55-6	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	MW-74-08	04/07/08	VOC	Trichloroethene	79-01-6	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)anthracene	56-55-3	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(b)fluoranthene	205-99-2	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(g,h,i)perylene	191-24-2	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(k)fluoranthene	207-08-9	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Chrysene	218-01-9	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	MW-74-08	04/07/08	SVOC	Dibenz(a,h)anthracene	53-70-3	6.10E-04	2.0E-03	3.1E-01	2.0E-03	3.1E-01					2.0E-03	3.1E-01
PAOC02	MW-74-08	04/07/08	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	2.00E-03	2.0E-03	1.0E+00	2.0E-03	1.0E+00					2.0E-03	1.0E+00
PAOC02	MW-74-08	04/07/08	INORG	Aluminum	7429-90-5	4.59E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC03	MW-10-07	11/27/07	INORG	Aluminum	7429-90-5	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	MW-10-07	11/27/07	INORG	Lead	7439-92-1	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	MW-10-07	11/27/07	INORG	Vanadium	7440-62-2	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC05	MW-1	05/01/90	VOC	Benzene	71-43-2	9.90E-01	5.0E-03	2.0E+02	5.0E-03	2.0E+02	5.6E+00	1.8E-01	3.5E+01	2.8E-02	1.1E+01	9.0E-02
PAOC05	MW-1	05/01/90	VOC	Vinyl Chloride	75-01-4	7.50E-02	2.0E-03	3.8E+01	2.0E-03	3.8E+01	1.1E+00	6.8E-02	1.3E+01	5.8E-03	1.0E+00	7.5E-02
PAOC05	MW-1	03/11/93	VOC	Benzene	71-43-2	3.00E+00	5.0E-03	6.0E+02	5.0E-03	6.0E+02	5.6E+00	5.4E-01	3.5E+01	8.6E-02	1.1E+01	2.7E-01
PAOC05	MW-1	01/10/94	VOC	Benzene	71-43-2	2.60E+00	5.0E-03	5.2E+02	5.0E-03	5.2E+02	5.6E+00	4.6E-01	3.5E+01	7.4E-02	1.1E+01	2.4E-01
PAOC05	MW-1	01/10/94	VOC	Benzene	71-43-2	2.70E+00	5.0E-03	5.4E+02	5.0E-03	5.4E+02	5.6E+00	4.8E-01	3.5E+01	7.7E-02	1.1E+01	2.5E-01
PAOC05	MW-3	05/01/90	VOC	Benzene	71-43-2	5.30E-03	5.0E-03	1.1E+00	5.0E-03	1.1E+00	5.6E+00	9.5E-04	3.5E+01	1.5E-04	1.1E+01	4.8E-04
PAOC05	MW-3	05/01/90	VOC	Vinyl Chloride	75-01-4	1.20E-02	2.0E-03	6.0E+00	2.0E-03	6.0E+00	1.1E+00	1.1E-02	1.3E+01	9.2E-04	1.0E+00	1.2E-02
PAOC05	MW-33-07	01/09/08	INORG	Aluminum	7429-90-5	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	MW-33-07	01/09/08	INORG	Vanadium	7440-62-2	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC05	MW-34-07	01/08/08	INORG	Aluminum	7429-90-5	3.66E-01	3.0E-01	1.2E+00	4.1E+00	8.9E-02					6.4E+04	5.7E-06
PAOC05	MW-37-07	01/08/08	SVOC	Benzo(a)pyrene	50-32-8	6.40E-04	5.0E-03	1.3E-01	5.0E-03	1.3E-01					1.0E-03	6.4E-01
PAOC05	MW-37-07	01/08/08	SVOC	Benzo(b)fluoranthene	205-99-2	1.20E-03	1.5E-03	8.0E-01	1.5E-03	8.0E-01					1.5E-03	8.0E-01
PAOC05	MW-6	01/10/94	VOC	Benzene	71-43-2	9.70E-01	5.0E-03	1.9E+02	5.0E-03	1.9E+02	5.6E+00	1.7E-01	3.5E+01	2.8E-02	1.1E+01	8.8E-02
PAOC05	MW-6	02/01/94	VOC	Benzene	71-43-2	1.40E-02	5.0E-03	2.8E+00	5.0E-03	2.8E+00	5.6E+00	2.5E-03	3.5E+01	4.0E-04	1.1E+01	1.3E-03
PAOC05	PW-1 #1	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #1	11/01/90	VOC	Ethyl Benzene	100-41-4	1.70E+00	7.0E-01	2.4E+00	7.0E-01	2.4E+00	1.1E+02	1.5E-02	1.7E+02	1.0E-02	1.7E+02	1.0E-02
PAOC05	PW-1 #1	11/01/90	VOC	Toluene	108-88-3	1.80E+01	1.0E+00	1.8E+01	1.0E+00	1.8E+01	5.3E+02	3.4E-02	5.3E+02	3.4E-02	5.3E+02	3.4E-02
PAOC05	PW-1 #1	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #2	11/01/90	VOC	Benzene	71-43-2	1.40E+01	5.0E-03	2.8E+03	5.0E-03	2.8E+03	5.6E+00	2.5E+00	3.5E+01	4.0E-01	1.1E+01	1.3E+00
PAOC05	PW-1 #2	11/01/90	VOC	Ethyl Benzene	100-41-4	2.10E+00	7.0E-01	3.0E+00	7.0E-01	3.0E+00	1.1E+02	1.9E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	PW-1 #2	11/01/90	VOC	Toluene	108-88-3	2.00E+01	1.0E+00	2.0E+01	1.0E+00	2.0E+01	5.3E+02	3.8E-02	5.3E+02	3.8E-02	5.3E+02	3.8E-02
PAOC05	PW-1 #2	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #3	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #3	11/01/90	VOC	Ethyl Benzene	100-41-4	1.40E+00	7.0E-01	2.0E+00	7.0E-01	2.0E+00	1.1E+02	1.3E-02	1.7E+02	8.2E-03	1.7E+02	8.2E-03
PAOC05	PW-1 #3	11/01/90	VOC	Toluene	108-88-3	1.80E+01	1.0E+00	1.8E+01	1.0E+00	1.8E+01	5.3E+02	3.4E-02	5.3E+02	3.4E-02	5.3E+02	3.4E-02
PAOC05	PW-1 #3	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #4	11/01/90	VOC	Benzene	71-43-2	1.20E+01	5.0E-03	2.4E+03	5.0E-03	2.4E+03	5.6E+00	2.1E+00	3.5E+01	3.4E-01	1.1E+01	1.1E+00
PAOC05	PW-1 #4	11/01/90	VOC	Ethyl Benzene	100-41-4	1.30E+00	7.0E-01	1.9E+00	7.0E-01	1.9E+00	1.1E+02	1.2E-02	1.7E+02	7.6E-03	1.7E+02	7.6E-03

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC05	PW-1 #4	11/01/90	VOC	Toluene	108-88-3	1.70E+01	1.0E+00	1.7E+01	1.0E+00	1.7E+01	5.3E+02	3.2E-02	5.3E+02	3.2E-02	5.3E+02	3.2E-02
PAOC05	PW-1 #4	11/01/90	VOC	Xylenes (total)	1330-20-7	1.50E+01	1.0E+01	1.5E+00	1.0E+01	1.5E+00	1.9E+02	7.9E-02	1.9E+02	7.9E-02	1.9E+02	7.9E-02
PAOC05	PW-1 #5	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #5	11/01/90	VOC	Ethyl Benzene	100-41-4	2.00E+00	7.0E-01	2.9E+00	7.0E-01	2.9E+00	1.1E+02	1.8E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	PW-1 #5	11/01/90	VOC	Toluene	108-88-3	2.20E+01	1.0E+00	2.2E+01	1.0E+00	2.2E+01	5.3E+02	4.2E-02	5.3E+02	4.2E-02	5.3E+02	4.2E-02
PAOC05	PW-1 #5	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC10	MW-35-07	01/08/08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	MW-35-07	01/09/08	INORG	Aluminum	7429-90-5	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	MW-35-07	01/09/08	INORG	Arsenic	7440-38-2	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	MW-35-07	01/09/08	INORG	Vanadium	7440-62-2	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
Note:																
See notes on Table 2a.																

Table 3a: Upper-Bound Cumulative Cancer Risk and HI estimates for Potential Soil Exposures Pontiac Validation Center, Pontiac, Michigan							
Routine Worker Contact		Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI	Risk	HI
5E-05	4E+01	7E-05	7E+02	4E-06	6E+00	8E-06	2E+02
Notes:							
Upper-bound cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site.							
Values in bold and shaded in gray exceed USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.							
Routine worker estimates assume exposure for 250 days/year for 25 years.							
Maintenance worker estimates assume exposure for 30 days/year for 10 years.							
Construction worker estimates assume exposure for 250 days/year for 1 year.							

Table 3b: High-End Cumulative Cancer Risk and HI Estimates for Potential Soil Exposures Pontiac Validation Center, Pontiac, Michigan							
Routine Worker Contact		Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI	Risk	HI
3E-05	5E-01	5E-05	1E+00	3E-06	3E-01	4E-06	2E+00
Notes:							
Values in bold and shaded in gray exceed the USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.							
High-end cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site except as follows:							
Results from the following samples: "Floor 1","West Wall 1","North Wall 1","North Wall 2","A 14-15","S-6318-062895-DJC-E005","S-6318-063095-DJC-E012","S-6318-063095-DJC-E013","S-6318-063095-DJC-E014","S-6318-070695-DJC-E017","S-6318-070695-DJC-E018","S-6318-071495-EVD-031","S-6318-071495-EVD-032","SS-8-A-Side-Area1","SS-9-A","S-6318-070595-DJC-E016", and "C 14-15" were removed from the calculations.							
Routine worker, maintenance worker, and construction worker risk estimates included 95% Upper Confidence Limits on the mean (95% UCLs) for naphthalene, PCBs (total), manganese, and mercury.							
Vapor intrusion risk estimates included the vertically averaged concentration for 1,2,4-trimethylbenzene from location MW-33-07.							
Routine worker estimates assume exposure for 250 days/year for 25 years.							
Maintenance worker estimates assume exposure for 30 days/year for 10 years.							
Construction worker estimates assume exposure for 250 days/year for 1 year.							

Table 3c: High-End Noncancer Risk Estimates for the Construction Worker Exposure to Soil: Critical Effects Summary Pontiac Validation Center, Pontiac, Michigan					
Chem Group	Chemical	CASRN	Most Significant Pathway	Critical Effects	HQ
SVOC	Naphthalene	91-20-3	Vapor Inhalation	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively	2E-01
PCB	PCBs (total)	1336-36-3	Ingestion	Neurological	3E-01
INORG	Manganese	7439-96-5	Particulate Inhalation	Impairment of neurobehavioral function	5E-01
VARIOUS	Remaining Chemicals	Various	Various	Various	6E-01
References:					
USEPA. Integrated Risk Information System (IRIS). On-line database.					
ATSDR. 2007. Minimal Risk Levels. November.					

Table 4: Upper-Bound Cumulative Cancer Risk and HI Estimates for Potential Groundwater Exposure Pontiac Validation Center, Pontiac, Michigan					
Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI
2E-05	4E-01	4E-05	1E+00	4E-06	5E-01
Notes:					
Upper-bound cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site.					
Maintenance worker estimates assume exposure for 5 days/year for 10 years.					
Construction worker estimates assume exposure for 5 days/year for 1 year.					

Table 5: Cumulative Cancer Risk and HI Estimates for Exposure to NAPL Pontiac Validation Center, Pontiac, MI		
Receptor	Cumulative Cancer Risk	HI
Routine Worker Vapor Intursion	3E-07	4E-01
Maintenance Worker Contact	3E-06	4E+00
Notes:		
Values in bold and shaded in gray exceed the USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.		
Direct contact exposure routes include dermal contact with, and inhalation of vapors from NAPL.		

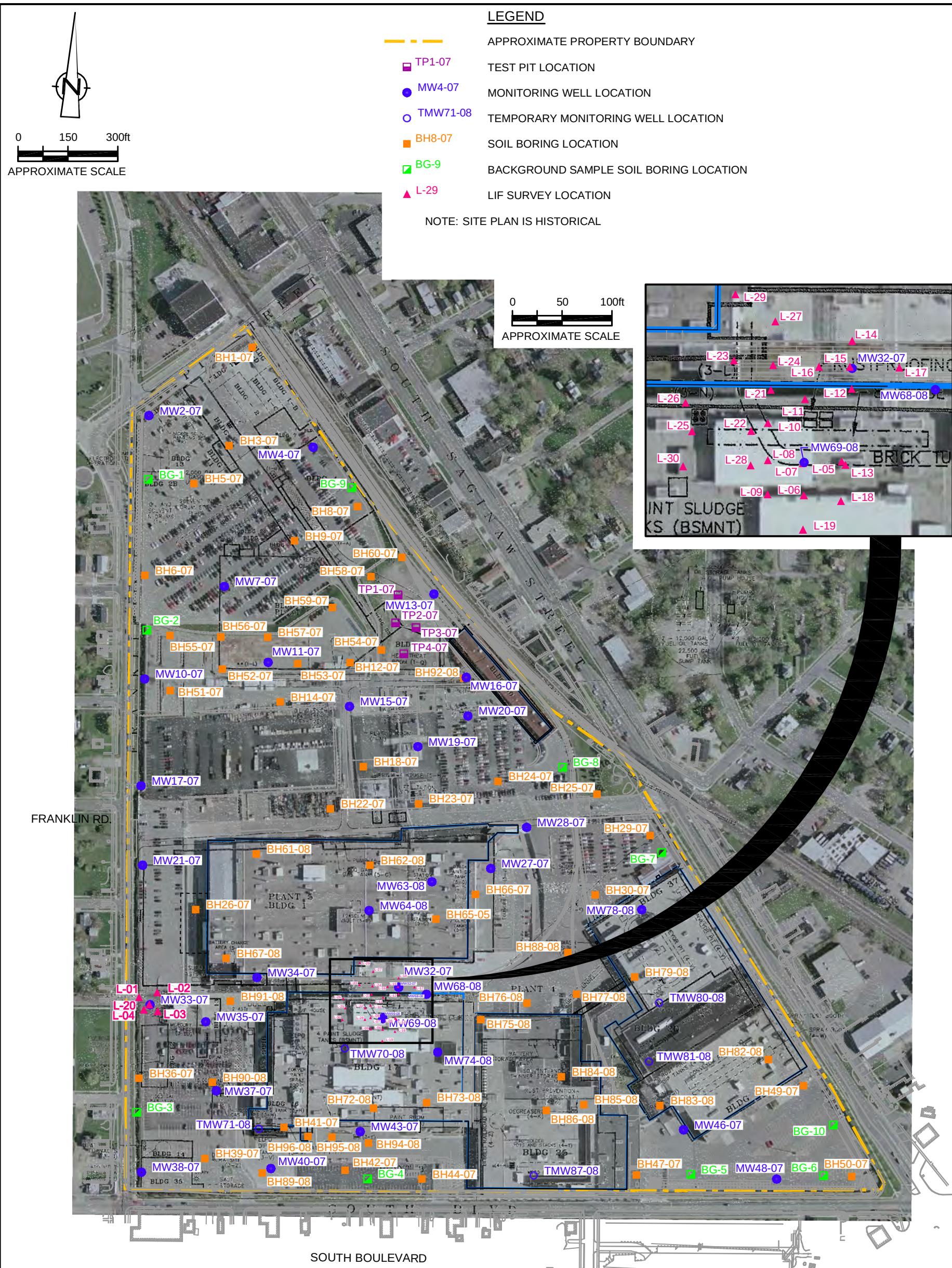
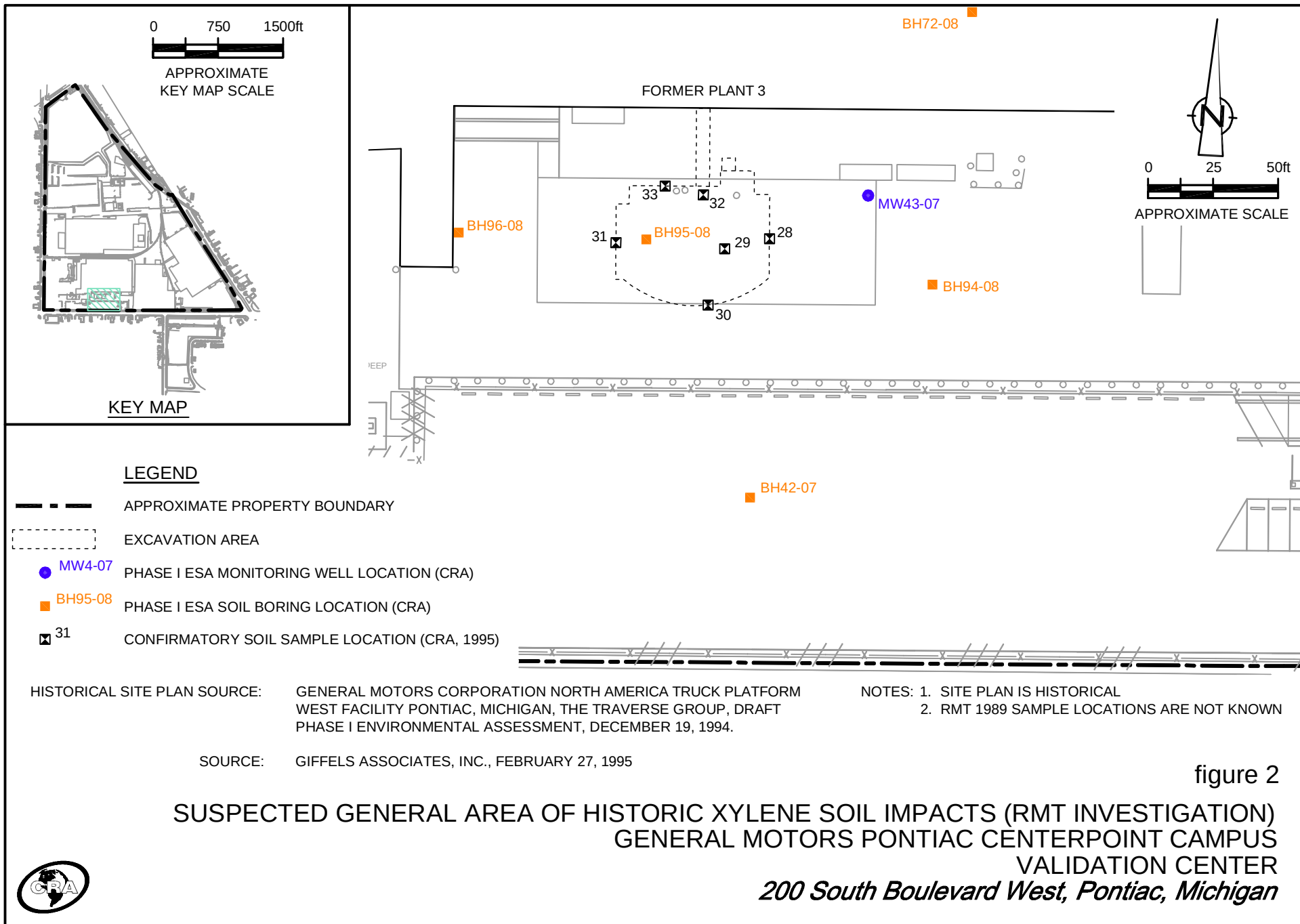
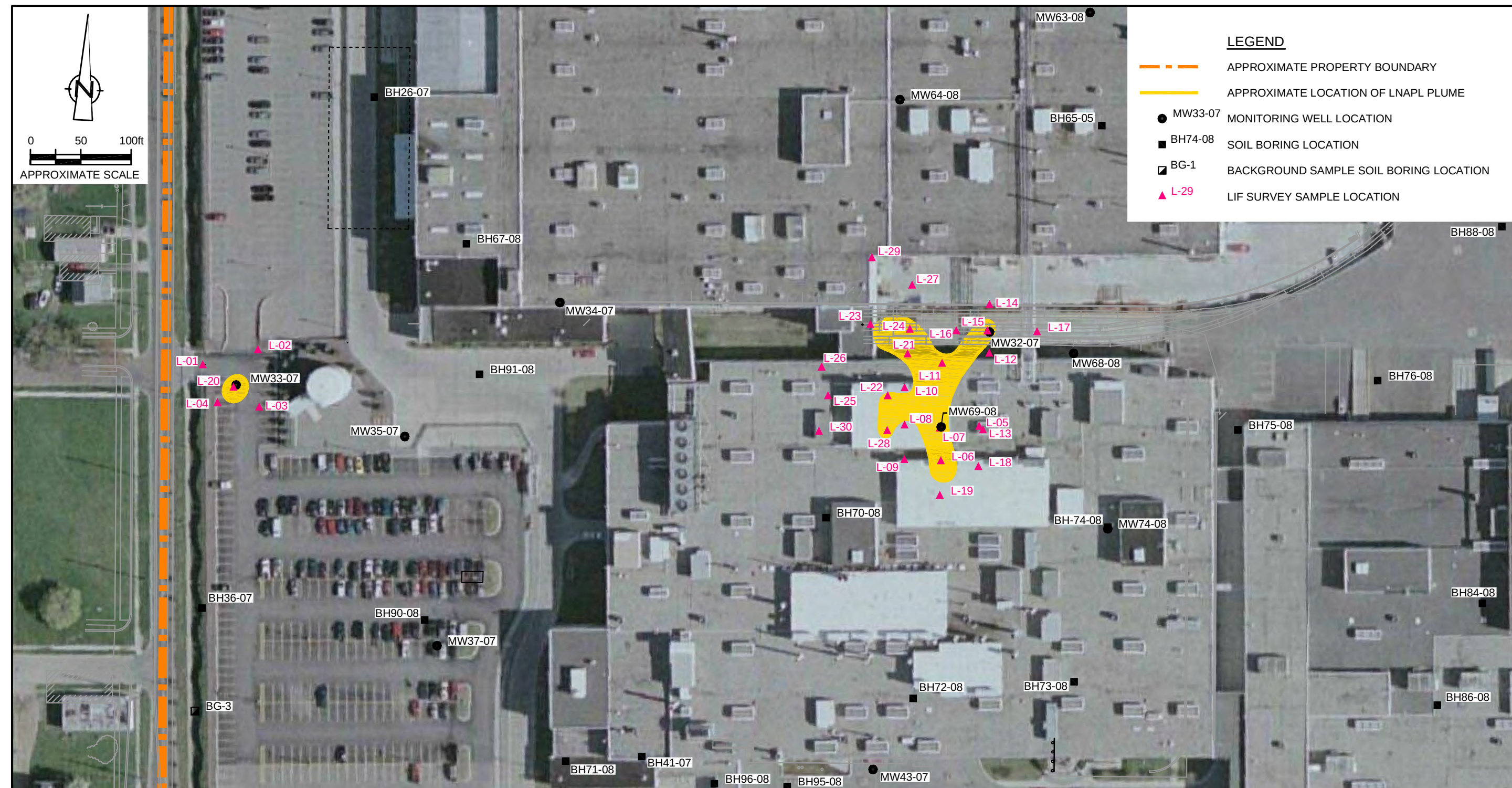


figure 1

COMPLETED SOIL BORING LOCATIONS
GENERAL MOTORS PONTIAC CENTERPOINT CAMPUS
VALIDATION CENTER
200 South Boulevard West, Pontiac, Michigan





HISTORICAL SITE PLAN SOURCE: GENERAL MOTORS CORPORATION NORTH AMERICA TRUCK PLATFORM
WEST FACILITY PONTIAC, MICHIGAN, THE TRAVERSE GROUP, DRAFT
PHASE I ENVIRONMENTAL ASSESSMENT, DECEMBER 19, 1994.

NOTE: SITE PLAN IS HISTORICAL

figure 3
LIF INVESTIGATION LOCATIONS
GENERAL MOTORS PONTIAC CENTERPOINT CAMPUS
VALIDATION CENTER
200 South Boulevard West, Pontiac, Michigan



Table 1b: Exceedance Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Location	Top Depth (ft)	Bottom Depth (ft)	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/kg)	Site Specific Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Conc to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Conc to Res VSIC	Residential PSIC (mg/kg)	Ratio of Conc to Res PSIC	Residential DCC (mg/kg)	Ratio of Conc to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Conc to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Conc to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Conc to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Conc to Industrial II DCC
Background	BG-06	7	9	03/07/08	INORG	Manganese	7439-96-5	4.11E+03	4.40E+02					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
PAOC02	MW-74-08	0	2	03/14/08	VOC	1,1-Dichloroethene	75-35-4	1.10E-01		6.2E-02	1.8E+00	1.1E+00	1.0E-01	6.2E+04	1.8E-06	2.0E+02	5.5E-04	3.3E-01	3.3E-01	3.7E+00	3.0E-02	7.8E+04	1.4E-06	5.7E+02	1.9E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	1,1-Dichloroethene	75-35-4	2.60E-01		6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	Trichloroethene	79-01-6	7.60E+00		7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02
PAOC04	BH-92-08	7.5	9.5	03/14/08	INORG	Arsenic	7440-38-2	1.21E+01						7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.3E-01
PAOC05	BH-36-07	0	2	12/03/07	SVOC	Benzo(a)pyrene	50-32-8	2.60E+00						1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC06	BH-47-07	17.5	20	10/09/07	INORG	Arsenic	7440-38-2	1.11E+01						7.2E+02	1.5E-02	7.6E+00	1.5E+00					9.1E+02	1.2E-02	3.7E+01	3.0E-01
PAOC12	MW-13-07	0	2	10/18/07	INORG	Lead	7439-92-1	4.46E+02						1.0E+05	4.5E-03	4.0E+02	1.1E+00					4.4E+04	1.0E-02	9.0E+02	5.0E-01
PAOC21	MW-28-07	0	2	10/17/07	INORG	Manganese	7439-96-5	2.27E+03	4.40E+02					3.3E+03	5.5E-01	2.5E+04	7.3E-02					1.5E+03	1.2E+00	9.0E+04	2.0E-02
PAOC22	BH-72-08	12	14	03/13/08	PCB	PCBs (total)	1336-36-3	2.20E+01		3.0E+03	7.3E-03	2.4E+02	9.2E-02	5.2E+03	4.2E-03	4.0E+00	5.5E+00	1.6E+04	1.4E-03	8.1E+02	2.7E-02	6.5E+03	3.4E-03	1.6E+01	1.4E+00
Notes:																									
Only constituents exceeding the listed MDEQ criteria are shown.																									
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																									
Background concentrations from MDEQ Part 201 (MDEQ 2006) were considered for manganese. The concentrations of all other constituents were assumed to be site-related.																									
Ratios of site-related concentration to the criteria greater than 1 are shaded in bold.																									
Chem Group - chemical group																									
SVIIC - MDEQ Soil Volatilization to Indoor Air Inhalation Criteria																									
VSIC - MDEQ Volatile Soil Inhalation Criteria (ambient air)																									
PSIC - MDEQ Particulate Soil Inhalation Criteria																									
DCC - MDEQ Direct Contact Criteria (mg/kg)																									

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	MW-11-07	11/27/07	INORG	Aluminum	7429-90-5	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	MW-19-07	11/27/07	INORG	Aluminum	7429-90-5	4.63E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC01	MW-2-07	11/28/07	VOC	Trichloroethene	79-01-6	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	MW-2-07	11/28/07	PCB	PCBs (total)	1336-36-3	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	MW-2-07	11/28/07	INORG	Manganese	7439-96-5	2.15E+00	8.6E-01	2.5E+00	2.5E+00	8.6E-01					9.1E+03	2.4E-04
PAOC02	MW-32-07	01/09/08	INORG	Aluminum	7429-90-5	3.25E-01	3.0E-01	1.1E+00	4.1E+00	7.9E-02					6.4E+04	5.1E-06
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.67E+00	2.0E+00	3.8E+00	5.6E+00	1.4E+00					5.8E+04	1.3E-04
PAOC02	MW-63-08	04/07/08	INORG	Lead	7439-92-1	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						
PAOC02	MW-68-08	04/07/08	INORG	Aluminum	7429-90-5	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	MW-74-08	04/07/08	VOC	1,1-Dichloroethene	75-35-4	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	MW-74-08	04/07/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	MW-74-08	04/07/08	VOC	1,1,1-Trichloroethane	71-55-6	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	MW-74-08	04/07/08	VOC	Trichloroethene	79-01-6	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)anthracene	56-55-3	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(b)fluoranthene	205-99-2	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(g,h,i)perylene	191-24-2	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(k)fluoranthene	207-08-9	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Chrysene	218-01-9	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	MW-74-08	04/07/08	INORG	Aluminum	7429-90-5	4.59E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC03	MW-10-07	11/27/07	INORG	Aluminum	7429-90-5	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	MW-10-07	11/27/07	INORG	Lead	7439-92-1	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	MW-10-07	11/27/07	INORG	Vanadium	7440-62-2	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC05	MW-33-07	01/09/08	INORG	Aluminum	7429-90-5	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	MW-33-07	01/09/08	INORG	Vanadium	7440-62-2	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC05	MW-34-07	01/08/08	INORG	Aluminum	7429-90-5	3.66E-01	3.0E-01	1.2E+00	4.1E+00	8.9E-02					6.4E+04	5.7E-06
PAOC10	MW-35-07	01/08/08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	MW-35-07	01/09/08	INORG	Aluminum	7429-90-5	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	MW-35-07	01/09/08	INORG	Arsenic	7440-38-2	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	MW-35-07	01/09/08	INORG	Vanadium	7440-62-2	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
Notes:																
Only constituents exceeding the listed MDEQ criteria are shown.																
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																
Ratios of concentration to the criteria greater than 1 are shaded in bold.																
Chem Group - chemical group																
DWC - MDEQ Drinking Water Criteria																
GVIIC - MDEQ Groundwater Volatilization to Indoor Air Inhalation Criteria																
GCC - MDEQ Groundwater Contact Criteria																

APPENDIX F

ENVIRON MEMORANDUM - QUANTITATIVE RISK ASSESSMENT RESULTS

December 19, 2008

MEMORANDUM

To: Geraldine Barnuevo, GM

cc: Marilyn Dedyne, GM
Fred Rindhage, GM
Jean Caufield, GM
Laura Fitzpatrick, Esq., GM

From: Francis Ramacciotti
Steve Song

Subject: Soil, Groundwater, and LNAPL Data Evaluation
GM Pontiac Validation Center, Pontiac, Michigan

ENVIRON has performed a data screening and risk evaluation using the existing soil, groundwater, and light non-aqueous phase liquid (LNAPL) data collected at the General Motors (GM) Pontiac Validation Center in Pontiac, Michigan (Site) to identify potentially significant current and future exposures. Potential routine worker, maintenance worker, and construction worker exposures to soil, groundwater, and LNAPL were evaluated based on an understanding that GM intends to use a deed restriction to restrict future land use at the Site to commercial/industrial. The data used in the data screening and risk evaluation included those collected from 1989 through 2008 during various environmental site assessments. While the data collected in 2007 and 2008 are believed to be the most representative of current conditions at the Site, all data were used in screening and risk evaluation.

Methodology

Data screening was performed using Michigan Department of Environmental Quality (MDEQ) Part 201 Generic Screening Levels (MDEQ Operational Memorandum No. 1, Part 201 Cleanup Criteria, January 2006), which are based on a target cancer risk of 10^{-5} and a target hazard quotient of 1.

Soil screening criteria used include the following:

1. MDEQ Part 201 industrial and residential direct contact criteria;
2. MDEQ Part 201 industrial and residential soil volatilization to indoor air criteria;
3. MDEQ Part 201 industrial and residential soil inhalation criteria (outdoor air); and,
4. MDEQ Part 201 industrial and residential particulate inhalation criteria.

Groundwater screening criteria used include the following:

1. MDEQ Part 201 industrial and residential drinking water criteria;
2. MDEQ Part 201 industrial and residential groundwater volatilization to indoor air criteria; and
3. MDEQ Part 201 groundwater contact criteria.

The data screening included Part 201 criteria for residential soil and groundwater exposures even though current and reasonably expected future land use is commercial/industrial to assist in identifying locations that should be considered for inclusion in a “due care plan” under Michigan Part 201 (reference).

In addition to the data screening, ENVIRON calculated cumulative cancer risk and non-cancer hazard index (HI) estimates for potential exposure to constituents in soil, groundwater, and LNAPL at the Site for the following exposure scenarios:

- routine worker ingestion, dermal contact, and inhalation of constituents in soil during typical activities that occur outdoors;
- routine worker inhalation of constituents in soil, groundwater, or LNAPL that volatilize and migrate into indoor air assuming a hypothetical commercial/industrial building that has the characteristics that MDEQ assumed in its derivation of the commercial/industrial soil and groundwater volatilization to indoor air criteria;
- maintenance worker and construction worker ingestion, dermal contact, and inhalation of constituents in soil during excavations into the subsurface;
- maintenance worker and construction worker ingestion, dermal contact, and inhalation of constituents in groundwater during excavations that extend into groundwater; and,
- maintenance worker and construction worker dermal contact, and inhalation of constituents in LNAPL during excavations that extend into LNAPL.

Cumulative cancer risk and HI estimates for potential exposures to soil were calculated using the highest concentration of each chemical from any depth at all sample locations across the Site. Cumulative cancer risk and HI estimates for potential exposures to groundwater were calculated using the highest concentration of each chemical in groundwater from all sample locations across the Site during any sampling event. Cumulative cancer risk and HI estimates for potential exposures to LNAPL were calculated using the highest concentration of each chemical in LNAPL from MW69-08, which is the only location where LNAPL was sampled. Because the highest concentration detected in soil, groundwater, and LNAPL were used in the risk calculations, the resulting risk estimates should be considered upper-bound risk estimates, which are more conservative than reasonable maximum exposure (RME) risk estimates. Figure 1 shows the locations where data have been collected at the Site.

Summary of Results

The soil and groundwater data from the Site were compared to the screening criteria discussed above to identify locations that should be considered for inclusion in a “due care plan” under Michigan Part 201 Natural Resources and Environmental Reporting Act 1994 PA 541. The results of the comparison are summarized on Tables 1a and 2a, which show the highest site-

related¹ concentrations of constituents detected in soil and groundwater, and highlight the ratios of the concentration to screening criteria that are higher than 1. The individual soil and groundwater samples and constituents that exceeded the screening criteria are presented on Tables 1b and 2b, respectively.

The upper-bound cumulative cancer risk and HI estimates for potential routine worker contact with outdoor soil are summarized on Table 3a. Table 3a also summarizes the upper-bound risk estimates for potential routine worker exposure via vapor intrusion into a hypothetical commercial/industrial building and potential maintenance worker and construction worker contact with soil. As shown in this table, none of these upper-bound cumulative cancer risk estimates exceeds USEPA's acceptable cumulative cancer risk limit of 10^{-4} for RME risks. However, all of the upper-bound HI estimates exceed USEPA's acceptable HI limit of 1 for RME risks. The upper-bound HI estimates that exceed 1 are due to elevated xylene concentrations in soil (up to 23,000 mg/kg) at former tanks south of Building 17 (as shown on Figure 2). These xylene data were collected in 1989 and 1995 and may not be representative of current concentrations at this area. However, in the absence of more representative data these data indicate a potential for significant exposure via volatilization to indoor air and routine worker, maintenance worker, and construction worker direct contact with soil in this area.

The upper-bound risk estimates for routine worker, maintenance worker, and construction worker direct contact exposures were refined to identify additional areas where potentially significant exposures may exist by removing the historic data collected at the former tanks south of Building 17 and using 95% UCLs in place of the maximum detected concentration for constituents contributing most significantly to the HI estimates. Specifically, the maximum detected concentrations of naphthalene, PCBs (total), manganese, and mercury were replaced with 95% UCLs which were conservatively calculated using maximum detected concentration with the highest concentrations at any depth from the nine locations nearest to the maximum concentration. These high-end estimates of cumulative cancer risk and HI for routine worker, maintenance worker, and construction worker exposure are shown on Table 3b. As shown on Table 3b, the cumulative cancer risk estimates, after incorporating these refinements, meet USEPA's HI limit for RME exposures except for the construction worker HI which slightly exceeds 1. However, the noncancer HI estimates on Table 3b sum the hazard quotient for individual chemicals regardless of the effects of each chemical. Segregating the hazard index by health effect or target organ, which is consistent with USEPA risk assessment methodology, gives HI estimates for construction worker exposure that do not exceed USEPA's HI limit, as shown on Table 3c.

The upper-bound HI estimate for potential routine worker exposure to constituents in soil that could volatilize and migrate into a hypothetical commercial/industrial building were refined by using the vertically averaged concentration of 1,2,4-trimethylbenzene at location MW-33-07 instead of the maximum detected concentration of 1,2,4-trimethylbenzene and are summarized on Table 3b. As shown in this table, the HI estimate for potential routine worker vapor intrusion exposure meets USEPA's acceptable noncancer HI limit of 1 for RME risk.

¹ Manganese concentrations at or below 440 mg/kg were assumed to represent the naturally occurring background concentration of manganese in soil (i.e., not included in site-related risk estimates) per MDEQ Part 201 (January 2006).

The upper-bound cumulative cancer risk and HI estimates for potential routine worker exposure via vapor intrusion and potential maintenance worker and construction worker direct contact exposure to constituents in groundwater are summarized on Table 4. As shown in this table, none of the upper-bound cumulative cancer risk and HI estimates exceeds USEPA's acceptable cumulative cancer risk and noncancer HI limits of 10^{-4} and 1 for RME risks, respectively.

The upper-bound cumulative cancer risk and HI estimates for potential routine worker exposure via vapor intrusion into a hypothetical commercial/industrial building and potential maintenance worker direct contact exposure to constituents in LNAPL are summarized on Table 5. As shown in this table, none of the upper-bound cumulative cancer risk and HI estimates exceeds USEPA's acceptable cumulative cancer risk and noncancer HI limits of 10^{-4} and 1 for RME risks, respectively, except the HI for potential maintenance worker or construction worker contact with LNAPL. The extent of LNAPL around monitoring well MW69-08, the location where LNAPL was sampled, has been delineated and is shown on Figure 3. LNAPL was also identified near monitoring well MW33-07, however, no sample of that LNAPL was collected for chemical analysis because of insufficient sample volume.

Based on the results summarized on Table 3b, Table 4, and Table 5, the soil, groundwater, and LNAPL data used in the evaluation do not indicate a potential for significant worker exposures at the Site, except for xylene concentrations in soil south of Building 17 (Figure 2) and chloromethane concentrations in LNAPL north of Building 17 (Figure 3).

Please contact us if you have questions regarding this evaluation for the GM Pontiac Validation Center Site.

Enclosures

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
Background	INORG	Antimony	7440-36-0		18	18	3.00E-02	1.60E-01						1.3E+04	1.2E-05	1.8E+02	8.9E-04					5.9E+03	2.7E-05	6.7E+02	2.4E-04
Background	INORG	Arsenic	7440-38-2	A	19	19	1.20E+00	6.70E+00						7.2E+02	9.3E-03	7.6E+00	8.8E-01					9.1E+02	7.4E-03	3.7E+01	1.8E-01
Background	INORG	Barium	7440-39-3	NC	19	19	4.70E+00	2.14E+02						3.3E+05	6.5E-04	3.7E+04	5.8E-03					1.5E+05	1.4E-03	1.3E+05	1.6E-03
Background	INORG	Beryllium	7440-41-7	B1	19	17	1.40E-01	4.40E-01						1.3E+03	3.4E-04	4.1E+02	1.1E-03					5.9E+02	7.5E-04	1.6E+03	2.8E-04
Background	INORG	Cadmium	7440-43-9	B1	19	19	6.40E-02	6.20E-01						1.7E+03	3.6E-04	5.5E+02	1.1E-03					2.2E+03	2.8E-04	2.1E+03	3.0E-04
Background	INORG	Chromium III	16065-83-1	D	19	19	4.49E+00	1.52E+01						3.3E+05	4.6E-05	7.9E+05	1.9E-05					1.5E+05	1.0E-04	1.0E+06	1.5E-05
Background	INORG	Cobalt	7440-48-4	LC	19	19	2.40E+00	1.33E+01						1.3E+04	1.0E-03	2.6E+03	5.1E-03					5.9E+03	2.3E-03	9.0E+03	1.5E-03
Background	INORG	Copper	7440-50-8	D	19	19	6.10E+00	1.80E+01						1.3E+05	1.4E-04	2.0E+04	9.0E-04					5.9E+04	3.1E-04	7.3E+04	2.5E-04
Background	INORG	Lead	7439-92-1	B2	19	19	3.50E+00	2.76E+01						1.0E+05	2.8E-04	4.0E+02	6.9E-02					4.4E+04	6.3E-04	9.0E+02	3.1E-02
Background	INORG	Manganese	7439-96-5	D	19	19	5.57E+01	4.11E+03	4.40E+02					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
Background	INORG	Mercury	7439-97-6	D	19	8	1.80E-02	4.80E-02		4.8E+01	1.0E-03	5.2E+01	9.2E-04	2.0E+04	2.4E-06	1.6E+02	3.0E-04	8.9E+01	5.4E-04	6.2E+01	7.7E-04	8.8E+03	5.5E-06	5.8E+02	8.3E-05
Background	INORG	Nickel	7440-02-0	A	19	19	7.50E+00	2.51E+01						1.3E+04	1.9E-03	4.0E+04	6.3E-04					1.6E+04	1.6E-03	1.5E+05	1.7E-04
Background	INORG	Selenium	7782-49-2	D	19	19	1.70E-01	7.60E-01						1.3E+05	5.8E-06	2.6E+03	2.9E-04					5.9E+04	1.3E-05	9.6E+03	7.9E-05
Background	INORG	Silver	7440-22-4	D	19	9	1.90E-02	3.80E-02						6.7E+03	5.7E-06	2.5E+03	1.5E-05					2.9E+03	1.3E-05	9.0E+03	4.2E-06
Background	INORG	Thallium	7440-28-0		19	14	1.30E-01	3.90E-01								3.5E+01	1.1E-02							1.3E+02	3.0E-03
Background	INORG	Vanadium	7440-62-2		19	19	8.10E+00	2.42E+01								7.5E+02	3.2E-02							5.5E+03	4.4E-03
Background	INORG	Zinc	7440-66-6	ID	19	19	1.87E+01	5.79E+01								1.7E+05	3.4E-04							6.3E+05	9.2E-05
PAOC01	VOC	Acetone	67-64-1	ID	11	4	5.80E-03	4.30E-02		1.1E+05	3.9E-07	1.3E+05	3.3E-07	3.9E+08	1.1E-10	2.3E+04	1.9E-06	1.1E+05	3.9E-07	1.6E+05	2.7E-07	1.7E+08	2.5E-10	7.3E+04	5.9E-07
PAOC01	VOC	Benzene	71-43-2	A	11	2	2.30E-04	2.40E-04		1.6E+00	1.5E-04	1.3E+01	1.8E-05	3.8E+05	6.3E-10	1.8E+02	1.3E-06	8.4E+00	2.9E-05	4.5E+01	5.3E-06	4.7E+05	5.1E-10	4.0E+02	6.0E-07
PAOC01	VOC	2-Butanone	78-93-3	ID	11	4	1.30E-03	8.80E-03		2.7E+04	3.3E-07	2.9E+04	3.0E-07	6.7E+07	1.3E-10	2.7E+04	3.3E-07	2.7E+04	3.3E-07	3.5E+04	2.5E-07	2.9E+07	3.0E-10	2.7E+04	3.3E-07
PAOC01	VOC	Carbon Disulfide	75-15-0		11	1	1.00E-03	1.00E-03		7.6E+01	1.3E-05	1.3E+03	7.7E-07	4.7E+07	2.1E-11	2.8E+02	3.6E-06	1.4E+02	7.1E-06	1.6E+03	6.3E-07	2.1E+07	4.8E-11	2.8E+02	3.6E-06
PAOC01	VOC	1,2-Dichlorobenzene	95-50-1	D	11	1	3.40E-04	3.40E-04		2.1E+02	1.6E-06	3.9E+04	8.7E-09	1.0E+08	3.4E-12	2.1E+02	1.6E-06	2.1E+02	1.6E-06	4.6E+04	7.4E-09	4.4E+07	7.7E-12	2.1E+02	1.6E-06
PAOC01	VOC	1,3-Dichlorobenzene	541-73-1	D	11	1	3.20E-04	3.20E-04								1.7E+02	1.9E-06							1.7E+02	1.9E-06
PAOC01	VOC	Ethyl Benzene	100-41-4	D	11	1	2.60E-04	2.60E-04		8.7E+01	3.0E-06	7.2E+02	3.6E-07	1.0E+07	2.6E-11	1.4E+02	1.9E-06	1.4E+02	1.9E-06	2.4E+03	1.1E-07	1.3E+07	2.0E-11	1.4E+02	1.9E-06
PAOC01	VOC	Methylene Chloride	75-09-2	B2	11	1	1.20E-03	1.20E-03		4.5E+01	2.7E-05	2.1E+02	5.7E-06	6.6E+06	1.8E-10	1.3E+03	9.2E-07	2.4E+02	5.0E-06	7.0E+02	1.7E-06	8.3E+06	1.4E-10	2.3E+03	5.2E-07
PAOC01	VOC	Toluene	108-88-3	ID	11	3	2.10E-04	5.60E-04		2.5E+02	2.2E-06	2.8E+03	2.0E-07	2.7E+07	2.1E-11	2.5E+02	2.2E-06	2.5E+02	2.2E-06	3.3E+03	1.7E-07	1.2E+07	4.7E-11	2.5E+02	2.2E-06
PAOC01	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	11	1	2.50E-03	2.50E-03		1.1E+02	2.3E-05	2.1E+04	1.2E-07	8.2E+07	3.0E-11	1.1E+02	2.3E-05	1.1E+02	2.3E-05	2.5E+04	1.0E-07	3.6E+07	6.9E-11	1.1E+02	2.3E-05
PAOC01	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	11	1	2.20E-03	2.20E-03		9.4E+01	2.3E-05	1.6E+04	1.4E-07	8.2E+07	2.7E-11	9.4E+01	2.3E-05	9.4E+01	2.3E-05	1.9E+04	1.2E-07	3.6E+07	6.1E-11	9.4E+01	2.3E-05
PAOC01	VOC	Xylenes (total)	1330-20-7	ID	11	2	8.70E-04	3.10E-03		1.5E+02	2.1E-05	4.6E+04	6.7E-08	2.9E+08	1.1E-11	1.5E+02	2.1E-05	1.5E+02	2.1E-05	5.4E+04	5.7E-08	1.3E+08	2.4E-11	1.5E+02	2.1E-05
PAOC01	SVOC	Acenaphthene	83-32-9		11	2	7.90E-03	5.10E-02		1.9E+05	2.7E-07	8.1E+04	6.3E-07	1.4E+07	3.6E-09	4.1E+04	1.2E-06	3.5E+05	1.5E-07	9.7E+04	5.3E-07	6.2E+06	8.2E-09	1.3E+05	3.9E-07
PAOC01	SVOC	Acenaphthylene	208-96-8	D	11	1	2.60E-02	2.60E-02		1.6E+03	1.6E-05	2.2E+03	1.2E-05	2.3E+06	1.1E-08	1.6E+03	1.6E-05	3.0E+03	8.7E-06	2.7E+03	9.6E-06	1.0E+06	2.6E-08	5.2E+03	5.0E-06
PAOC01	SVOC	Anthracene	120-12-7	D	11	3	1.40E-02	3.50E-01		1.0E+06	3.5E-07	1.4E+06	2.5E-07	6.7E+07	5.2E-09	2.3E+05	1.5E-06	1.0E+06	3.5E-07	1.6E+06	2.2E-07	2.9E+07	1.2E-08	7.3E+05	4.8E-07
PAOC01	SVOC	Benzo(a)anthracene	56-55-3	B2	11	6	1.50E-02	8.50E-01								2.0E+01	4.3E-02							8.0E+01	1.1E-02
PAOC01	SVOC	Benzo(a)pyrene	50-32-8	B2	11	4	1.70E-02	3.60E-01						1.5E+03	2.4E-04	2.0E+00	1.8E-01					1.9E+03	1.9E-04	8.0E+00	4.5E-02
PAOC01	SVOC	Benzo(b)fluoranthene	205-99-2	B2	11	5	2.00E-02	3.20E-01								2.0E+01	1.6E-02							8.0E+01	4.0E-03
PAOC01	SVOC	Benzo(g,h,i)perylene	191-24-2	D	11	5	8.80E-03	1.90E-01						8.0E+05	2.4E-07	2.5E+03	7.6E-05					3.5E+05	5.4E-07	7.0E+03	2.7E-05
PAOC01	SVOC	Benzo(k)fluoranthene	207-08-9	B2	11	5	8.30E-03	3.40E-01								2.0E+02	1.7E-03							8.0E+02	4.3E-04
PAOC01	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	11	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC01	SVOC	Carbazole	86-74-8	B2	11	1	5.80E-02	5.80E-02								5.3E+02	1.1E-04							2.4E+03	2.4E-05
PAOC01	SVOC	Chrysene	218-01-9	B2	11	6	2.00E-02	9.50E-01								2.0E+03	4.8E-04							8.0E+03	1.2E-04
PAOC01	SVOC	Dibenzofuran	132-64-9	D	11	1	4.20E-02	4.20E-02																	
PAOC01	SVOC	Fluoranthene	206-44-0	D	11	6	2.70E-02	1.80E+00		1.0E+06	1.8E-06	7.4E+05	2.4E-06	9.3E+06	1.9E-07	4.6E+04	3.9E-05	1.0E+06	1.8E-06	8.9E+05	2.0E-06	4.1E+06	4.4E-07	1.3E+05	1.4E-05
PAOC01	SVOC	Fluorene	86-73-7	D	11	1	6.20E-02	6.20E-02		5.8E+05	1.1E-07	1.3E+05	4.8E-07	9.3E+06	6.7E-09	2.7E+04	2.3E-06	1.0E+06	6.2E-08	1.5E+05	4.1E-07	4.1E+06	1.5E-08	8.7E+04	7.1E-07
PAOC01	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	11	4	9.30E-03	1.80E-01								2.0E+01	9.0E-03							8.0E+01	2.3E-03
PAOC01	SVOC	2-Methylnaphthalene	91-57-6	ID	11	3	9.70E-03	3.10E-02								8.1E+03	3.8E-06							2.6E+04	1.2E-06
PAOC01	SVOC	Naphthalene	91-20-3	C	11	3	8.90E-03	3.00E-02		2.5E+02	1.2E-04	3.0E+02	1.0E-04	2.0E+05	1.5E-07	1.6E+04	1.9E-06	4.7E+02	6.4E-05	3.5E+02	8.6E-05	8.8E+04	3.4E-07	5.2E+04	5.8E-07
PAOC01	SVOC	Phenanthrene	85-01-8	D	11	7	1.40E-02	1.50E+00		2.8E+03	5.4E-04	1.6E+02	9.4E-03	6.7E+03	2.2E-04	1.6E+03	9.4E-04	5.1E+03	2.9E-04	1.9E+02	7.9E-03	2.9E+03	5.2E-04	5.2E+03	2.9E-04
PAOC01	SVOC	Pyrene	129-00-0	NC	11	7	2.50E-02	1.70E+00		1.0E+06	1.7E-06	6.5E+05	2.6E-06	6.7E+06	2.5E-07	2.9E+04	5.9E-05	1.0E+06	1.7E-06	7.8E+05	2.2E-06	2.9E+06	5.9E-07	8.4E+04	2.0E-05
PAOC01	PCB	PCBs (total)	1336-36-3	B2	11	1	4.00E-02	4.00E-02		3.0E+03	1.3E-05	2.4E+02	1.7E-04	5.2E+03	7.7E-06	4.0E+00	1.0E-02	1.6E+04	2.5E-06	8.1E+02	4.9E-05	6.5E+03	6.2E-06	1.6E+01	2.5E-03
PAOC01	INORG	Antimony	7440-36-0		11	2	9.50E-02	1.20E-01						1.3E+04	9.2E-06	1.8E+02	6.7E-04					5.9E+03	2.0E-0		

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial DCC (mg/kg)	Ratio of Max Detect to Industrial DCC
PAOC02	VOC	1,4-Dichlorobenzene	106-46-7	C	38	1	4.70E-04	4.70E-04		1.9E+01	2.5E-05	7.7E+01	6.1E-06	4.5E+05	1.0E-09	4.0E+02	1.2E-06	1.0E+02	4.7E-06	2.6E+02	1.8E-06	5.7E+05	8.2E-10	1.9E+03	2.5E-07
PAOC02	VOC	1,1-Dichloroethane	75-34-3	SC	41	2	1.80E-02	7.40E-02		2.3E+02	3.2E-04	2.1E+03	3.5E-05	3.3E+07	2.2E-09	8.9E+02	8.3E-05	4.3E+02	1.7E-04	2.5E+03	3.0E-05	1.5E+07	4.9E-09	8.9E+02	8.3E-05
PAOC02	VOC	1,1-Dichloroethene	75-35-4	C	41	4	1.80E-03	2.60E-01		6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04
PAOC02	VOC	cis-1,2-Dichloroethene	156-59-2	ID	41	1	8.80E-04	8.80E-04		2.2E+01	4.0E-05	1.8E+02	4.9E-06	2.3E+06	3.8E-10	6.4E+02	1.4E-06	4.1E+01	2.1E-05	2.1E+02	4.2E-06	1.0E+06	8.8E-10	6.4E+02	1.4E-06
PAOC02	VOC	Ethyl Benzene	100-41-4	D	41	2	2.10E-02	2.50E-02		8.7E+01	2.9E-04	7.2E+02	3.5E-05	1.0E+07	2.5E-09	1.4E+02	1.8E-04	1.4E+02	1.8E-04	2.4E+03	1.0E-05	1.3E+07	1.9E-09	1.4E+02	1.8E-04
PAOC02	VOC	4-Methyl-2-pentanone	108-10-1	ID	41	1	8.90E-04	8.90E-04		2.7E+03	3.3E-07	4.5E+04	2.0E-08	1.4E+08	6.4E-12	2.7E+03	3.3E-07	2.7E+03	3.3E-07	5.3E+04	1.7E-08	6.0E+07	1.5E-11	2.7E+03	3.3E-07
PAOC02	VOC	Methylcyclohexane	108-87-2		26	3	1.70E-03	3.20E-01																	
PAOC02	VOC	Tetrachloroethene	127-18-4	C-B2	41	3	2.10E-03	7.40E-02		1.1E+01	6.7E-03	1.8E+02	4.1E-04	5.4E+06	1.4E-08	8.8E+01	8.4E-04	6.0E+01	1.2E-03	6.0E+02	1.2E-04	6.8E+06	1.1E-08	8.8E+01	8.4E-04
PAOC02	VOC	Toluene	108-88-3	ID	41	4	3.60E-04	1.00E-03		2.5E+02	4.0E-06	2.8E+03	3.6E-07	2.7E+07	3.7E-11	2.5E+02	4.0E-06	2.5E+02	4.0E-06	3.3E+03	3.0E-07	1.2E+07	8.3E-11	2.5E+02	4.0E-06
PAOC02	VOC	1,1,1-Trichloroethane	71-55-6	ID	41	2	4.00E-01	1.30E+00		2.5E+02	5.2E-03	3.8E+03	3.4E-04	6.7E+07	1.9E-08	4.6E+02	2.8E-03	4.6E+02	2.8E-03	4.5E+03	2.9E-04	2.9E+07	4.5E-08	4.6E+02	2.8E-03
PAOC02	VOC	Trichloroethene	79-01-6	C-B2	41	7	2.70E-03	7.60E+00		7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02
PAOC02	VOC	Trichlorofluoromethane	75-69-4		26	1	1.20E-03	1.20E-03		5.6E+02	2.1E-06	9.2E+04	1.3E-08	3.8E+09	3.2E-13	5.6E+02	2.1E-06	5.6E+02	2.1E-06	1.1E+05	1.1E-08	1.7E+09	7.1E-13	5.6E+02	2.1E-06
PAOC02	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	25	1	4.60E-01	4.60E-01		1.1E+02	4.2E-03	2.1E+04	2.2E-05	8.2E+07	5.6E-09	1.1E+02	4.2E-03	1.1E+02	4.2E-03	2.5E+04	1.8E-05	3.6E+07	1.3E-08	1.1E+02	4.2E-03
PAOC02	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	25	1	2.30E-01	2.30E-01		9.4E+01	2.4E-03	1.6E+04	1.4E-05	8.2E+07	2.8E-09	9.4E+01	2.4E-03	9.4E+01	2.4E-03	1.9E+04	1.2E-05	3.6E+07	6.4E-09	9.4E+01	2.4E-03
PAOC02	VOC	Xylenes (total)	1330-20-7	ID	40	3	6.30E-04	9.20E-02		1.5E+02	6.1E-04	4.6E+04	2.0E-06	2.9E+08	3.2E-10	1.5E+02	6.1E-04	1.5E+02	6.1E-04	5.4E+04	1.7E-06	1.3E+08	7.1E-10	1.5E+02	6.1E-04
PAOC02	SVOC	Acenaphthene	83-32-9		37	1	1.70E-02	1.70E-02		1.9E+05	8.9E-08	8.1E+04	2.1E-07	1.4E+07	1.2E-09	4.1E+04	4.1E-07	3.5E+05	4.9E-08	9.7E+04	1.8E-07	6.2E+06	2.7E-09	1.3E+05	1.3E-07
PAOC02	SVOC	Acenaphthylene	208-96-8	D	37	1	2.90E-02	2.90E-02		1.6E+03	1.8E-05	2.2E+03	1.3E-05	2.3E+06	1.3E-08	1.6E+03	1.8E-05	3.0E+03	9.7E-06	2.7E+03	1.1E-05	1.0E+06	2.9E-08	5.2E+03	5.6E-06
PAOC02	SVOC	Anthracene	120-12-7	D	37	4	8.20E-03	5.00E-02		1.0E+06	5.0E-08	1.4E+06	3.6E-08	6.7E+07	7.5E-10	2.3E+05	2.2E-07	1.0E+06	5.0E-08	1.6E+06	3.1E-08	2.9E+07	1.7E-09	7.3E+05	6.8E-08
PAOC02	SVOC	Benzo(a)anthracene	56-55-3	B2	37	5	8.80E-03	1.80E-01								2.0E+01	9.0E-03							8.0E+01	2.3E-03
PAOC02	SVOC	Benzo(a)pyrene	50-32-8	B2	37	5	8.10E-03	1.80E-01						1.5E+03	1.2E-04	2.0E+00	9.0E-02					1.9E+03	9.5E-05	8.0E+00	2.3E-02
PAOC02	SVOC	Benzo(b)fluoranthene	205-99-2	B2	25	5	8.60E-03	2.60E-01								2.0E+01	1.3E-02							8.0E+01	3.3E-03
PAOC02	SVOC	Benzo(b,k)fluoranthene	U-452		12	1	3.40E-01	3.40E-01																	
PAOC02	SVOC	Benzo(g,h,i)perylene	191-24-2	D	37	5	8.80E-03	1.70E-01						8.0E+05	2.1E-07	2.5E+03	6.8E-05					3.5E+05	4.9E-07	7.0E+03	2.4E-05
PAOC02	SVOC	Benzo(k)fluoranthene	207-08-9	B2	25	4	3.00E-02	1.00E-01								2.0E+02	5.0E-04							8.0E+02	1.3E-04
PAOC02	SVOC	Biphenyl	92-52-4	D	25	1	2.00E-01	2.00E-01																	
PAOC02	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	37	15	2.00E-02	3.60E-01						7.0E+05	5.1E-07	2.8E+03	1.3E-04							8.9E+05	4.0E-07
PAOC02	SVOC	Caprolactam	105-60-2		25	1	2.20E-01	2.20E-01						6.7E+05	3.3E-07	5.3E+04	4.2E-06							2.9E+05	7.6E-07
PAOC02	SVOC	Carbazole	86-74-8	B2	25	1	2.70E-02	2.70E-02								5.3E+02	5.1E-05							2.4E+03	1.1E-05
PAOC02	SVOC	Chrysene	218-01-9	B2	37	9	8.30E-03	2.30E-01								2.0E+03	1.2E-04							8.0E+03	2.9E-05
PAOC02	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	37	4	9.90E-03	3.80E-02								2.0E+00	1.9E-02							8.0E+00	4.8E-03
PAOC02	SVOC	Dibenzofuran	132-64-9	D	37	1	3.40E-02	3.40E-02																	
PAOC02	SVOC	Fluoranthene	206-44-0	D	37	9	9.80E-03	6.10E-01		1.0E+06	6.1E-07	7.4E+05	8.2E-07	9.3E+06	6.6E-08	4.6E+04	1.3E-05	1.0E+06	6.1E-07	8.9E+05	6.9E-07	4.1E+06	1.5E-07	1.3E+05	4.7E-06
PAOC02	SVOC	Fluorene	86-73-7	D	37	2	2.30E-02	6.80E-02		5.8E+05	1.2E-07	1.3E+05	5.2E-07	9.3E+06	7.3E-09	2.7E+04	2.5E-06	1.0E+06	6.8E-08	1.5E+05	4.5E-07	4.1E+06	1.7E-08	8.7E+04	7.8E-07
PAOC02	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	37	4	3.70E-02	1.20E-01								2.0E+01	6.0E-03							8.0E+01	1.5E-03
PAOC02	SVOC	2-Methylnaphthalene	91-57-6	ID	37	4	1.10E-01	3.10E+00								8.1E+03	3.8E-04							2.6E+04	1.2E-04
PAOC02	SVOC	Naphthalene	91-20-3	C	37	1	7.60E-02	7.60E-02		2.5E+02	3.0E-04	3.0E+02	2.5E-04	2.0E+05	3.8E-07	1.6E+04	4.8E-06	4.7E+02	1.6E-04	3.5E+02	2.2E-04	8.8E+04	8.6E-07	5.2E+04	1.5E-06
PAOC02	SVOC	Phenanthrene	85-01-8	D	37	9	1.00E-02	2.40E-01		2.8E+03	8.6E-05	1.6E+02	1.5E-03	6.7E+03	3.6E-05	1.6E+03	1.5E-04	5.1E+03	4.7E-05	1.9E+02	1.3E-03	2.9E+03	8.3E-05	5.2E+03	4.6E-05
PAOC02	SVOC	Pyrene	129-00-0	NC	37	9	7.70E-03	3.30E-01		1.0E+06	3.3E-07	6.5E+05	5.1E-07	6.7E+06	4.9E-08	2.9E+04	1.1E-05	1.0E+06	3.3E-07	7.8E+05	4.2E-07	2.9E+06	1.1E-07	8.4E+04	3.9E-06
PAOC02	PCB	PCBs (total)	1336-36-3	B2	37	1	4.25E-02	4.25E-02		3.0E+03	1.4E-05	2.4E+02	1.8E-04	5.2E+03	8.2E-06	4.0E+00	1.1E-02	1.6E+04	2.7E-06	8.1E+02	5.2E-05	6.5E+03	6.5E-06	1.6E+01	2.7E-03
PAOC02	INORG	Antimony	7440-36-0		51	25	4.20E-02	3.20E+00						1.3E+04	2.5E-04	1.8E+02	1.8E-02					5.9E+03	5.4E-04	6.7E+02	4.8E-03
PAOC02	INORG	Arsenic	7440-38-2	A	52	52	2.00E+00	1.20E+01						7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.2E-01
PAOC02	INORG	Barium	7440-39-3	NC	52	52	6.40E+00	1.98E+02						3.3E+05	6.0E-04	3.7E+04	5.4E-03					1.5E+05	1.3E-03	1.3E+05	1.5E-03
PAOC02	INORG	Beryllium	7440-41-7	B1	52	17	9.10E-02	1.80E+00						1.3E+03	1.4E-03	4.1E+02	4.4E-03					5.9E+02	3.1E-03	1.6E+03	1.1E-03
PAOC02	INORG	Cadmium	7440-43-9	B1	52	45	6.60E-02	2.90E+00						1.7E+03	1.7E-03	5.5E+02	5.3E-03					2.2E+03	1.3E-03	2.1E+03	1.4E-03
PAOC02	INORG	Chromium (total)	7440-47-3		27	27	4.80E+00	1.90E+01						2.6E+02	7.3E-02	2.5E+03	7.6E-03					2.4E+02	7.9E-02	9.2E+03	2.1E-03
PAOC02	INORG	Chromium III	16065-83-1	D	25	25	4.27E+00	1.85E+01						3.3E+05	5.6E-05	7.9E+05	2.3E-05					1.5E+05	1.2E-04	1.0E+06	1.8E-05
PAOC02	INORG	Chromium VI	18540-29-9	A	25	10	4.70E-01	4.10E+00						2.6E+02	1.6E-02	2.5E+03	1.6E-03					2.4E+02	1.7E-02	9.2E+03	4.5E-04
PAOC02	INORG	Cobalt	7440-48-4	LC	52	42	2.20E+00	1.90E+01						1.3E+04	1.5E-03	2.6E+03	7.3E-03					5.9E+03	3.2E-03	9.0E+03	2.1E-03
PAOC02	INORG	Copper	7440-50-8	D	52	52	4.00E+00	8.00E+01						1.3E+05	6.2E-04	2.0E+04	4.0E-03					5.9E+04	1.4E-03	7.3E+04	1.1E-03
PAOC02	INORG	Cyanide (total)	57-12-5	D	40	4	2.10E-01	1.20E+00						2.5E+02	4.8E-03	1.2E+01	1								

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC03	SVOC	Phenanthrene	85-01-8	D	9	5	1.10E-02	7.20E-02		2.8E+03	2.6E-05	1.6E+02	4.5E-04	6.7E+03	1.1E-05	1.6E+03	4.5E-05	5.1E+03	1.4E-05	1.9E+02	3.8E-04	2.9E+03	2.5E-05	5.2E+03	1.4E-05
PAOC03	SVOC	Pyrene	129-00-0	NC	9	6	2.00E-02	2.00E-01		1.0E+06	2.0E-07	6.5E+05	3.1E-07	6.7E+06	3.0E-08	2.9E+04	6.9E-06	1.0E+06	2.0E-07	7.8E+05	2.6E-07	2.9E+06	6.9E-08	8.4E+04	2.4E-06
PAOC03	PCB	PCBs (total)	1336-36-3	B2	9	2	3.05E-02	9.34E-01		3.0E+03	3.1E-04	2.4E+02	3.9E-03	5.2E+03	1.8E-04	4.0E+00	2.3E-01	1.6E+04	5.8E-05	8.1E+02	1.2E-03	6.5E+03	1.4E-04	1.6E+01	5.8E-02
PAOC03	INORG	Antimony	7440-36-0		9	4	1.10E-01	1.60E-01						1.3E+04	1.2E-05	1.8E+02	8.9E-04					5.9E+03	2.7E-05	6.7E+02	2.4E-04
PAOC03	INORG	Arsenic	7440-38-2	A	9	9	3.10E+00	5.80E+00						7.2E+02	8.1E-03	7.6E+00	7.6E-01					9.1E+02	6.4E-03	3.7E+01	1.6E-01
PAOC03	INORG	Barium	7440-39-3	NC	9	9	1.13E+01	6.35E+01						3.3E+05	1.9E-04	3.7E+04	1.7E-03					1.5E+05	4.2E-04	1.3E+05	4.9E-04
PAOC03	INORG	Beryllium	7440-41-7	B1	9	6	6.90E-02	5.60E-01						1.3E+03	4.3E-04	4.1E+02	1.4E-03					5.9E+02	9.5E-04	1.6E+03	3.5E-04
PAOC03	INORG	Cadmium	7440-43-9	B1	9	6	7.40E-02	3.10E-01						1.7E+03	1.8E-04	5.5E+02	5.6E-04					2.2E+03	1.4E-04	2.1E+03	1.5E-04
PAOC03	INORG	Chromium III	16065-83-1	D	9	9	4.49E+00	2.77E+01						3.3E+05	8.4E-05	7.9E+05	3.5E-05					1.5E+05	1.8E-04	1.0E+06	2.8E-05
PAOC03	INORG	Chromium VI	18540-29-9	A	9	6	7.20E-01	2.30E+00						2.6E+02	8.8E-03	2.5E+03	9.2E-04					2.4E+02	9.6E-03	9.2E+03	2.5E-04
PAOC03	INORG	Cobalt	7440-48-4	LC	9	9	2.00E+00	9.30E+00						1.3E+04	7.2E-04	2.6E+03	3.6E-03					5.9E+03	1.6E-03	9.0E+03	1.0E-03
PAOC03	INORG	Copper	7440-50-8	D	9	9	7.00E+00	2.56E+01						1.3E+05	2.0E-04	2.0E+04	1.3E-03					5.9E+04	4.3E-04	7.3E+04	3.5E-04
PAOC03	INORG	Cyanide (total)	57-12-5	D	9	2	1.30E-01	4.40E-01						2.5E+02	1.8E-03	1.2E+01	3.7E-02					2.5E+02	1.8E-03	2.5E+02	1.8E-03
PAOC03	INORG	Lead	7439-92-1	B2	9	9	8.80E+00	1.88E+01						1.0E+05	1.9E-04	4.0E+02	4.7E-02					4.4E+04	4.3E-04	9.0E+02	2.1E-02
PAOC03	INORG	Manganese	7439-96-5	D	9	9	2.21E+02	4.84E+02	4.40E+02					3.3E+03	1.3E-02	2.5E+04	1.8E-03					1.5E+03	2.9E-02	9.0E+04	4.9E-04
PAOC03	INORG	Mercury	7439-97-6	D	9	9	1.70E-02	5.00E-02		4.8E+01	1.0E-03	5.2E+01	9.6E-04	2.0E+04	2.5E-06	1.6E+02	3.1E-04	8.9E+01	5.6E-04	6.2E+01	8.1E-04	8.8E+03	5.7E-06	5.8E+02	8.6E-05
PAOC03	INORG	Nickel	7440-02-0	A	9	9	5.90E+00	3.28E+01						1.3E+04	2.5E-03	4.0E+04	8.2E-04					1.6E+04	2.1E-03	1.5E+05	2.2E-04
PAOC03	INORG	Selenium	7782-49-2	D	9	3	1.10E-01	2.70E-01						1.3E+05	2.1E-06	2.6E+03	1.0E-04					5.9E+04	4.6E-06	9.6E+03	2.8E-05
PAOC03	INORG	Silver	7440-22-4	D	9	7	5.90E-02	1.20E-01						6.7E+03	1.8E-05	2.5E+03	4.8E-05					2.9E+03	4.1E-05	9.0E+03	1.3E-05
PAOC03	INORG	Thallium	7440-28-0		9	9	1.00E-01	2.00E-01								3.5E+01	5.7E-03							1.3E+02	1.5E-03
PAOC03	INORG	Vanadium	7440-62-2		9	9	7.40E+00	2.78E+01								7.5E+02	3.7E-02							5.5E+03	5.1E-03
PAOC03	INORG	Zinc	7440-66-6	ID	9	9	2.86E+01	4.48E+01								1.7E+05	2.6E-04							6.3E+05	7.1E-05
PAOC04	VOC	Acetone	67-64-1	ID	6	2	7.10E-03	2.90E-02								2.3E+04	1.3E-06	1.1E+05	2.6E-07	1.6E+05	1.8E-07	1.7E+08	1.7E-10	7.3E+04	4.0E-07
PAOC04	VOC	Benzene	71-43-2	A	6	1	4.30E-04	4.30E-04		1.6E+00	2.7E-04	1.3E+01	3.3E-05	3.8E+05	1.1E-09	1.8E+02	2.4E-06	8.4E+00	5.1E-05	4.5E+01	9.6E-06	4.7E+05	9.1E-10	4.0E+02	1.1E-06
PAOC04	VOC	2-Butanone	78-93-3	ID	6	2	1.80E-03	6.50E-03		2.7E+04	2.4E-07	2.9E+04	2.2E-07	6.7E+07	9.7E-11	2.7E+04	2.4E-07	2.7E+04	2.4E-07	3.5E+04	1.9E-07	2.9E+07	2.2E-10	2.7E+04	2.4E-07
PAOC04	VOC	Carbon Disulfide	75-15-0		6	1	5.70E-04	5.70E-04		7.6E+01	7.5E-06	1.3E+03	4.4E-07	4.7E+07	1.2E-11	2.8E+02	2.0E-06	1.4E+02	4.1E-06	1.6E+03	3.6E-07	2.1E+07	2.7E-11	2.8E+02	2.0E-06
PAOC04	VOC	Cyclohexane	110-82-7	ID	6	1	5.20E-04	5.20E-04																	
PAOC04	VOC	Ethyl Benzene	100-41-4	D	6	1	2.50E-04	2.50E-04		8.7E+01	2.9E-06	7.2E+02	3.5E-07	1.0E+07	2.5E-11	1.4E+02	1.8E-06	1.4E+02	1.8E-06	2.4E+03	1.0E-07	1.3E+07	1.9E-11	1.4E+02	1.8E-06
PAOC04	VOC	Methylcyclohexane	108-87-2		6	1	3.00E-04	3.00E-04																	
PAOC04	VOC	Methylene Chloride	75-09-2	B2	6	2	6.60E-04	3.00E-03		4.5E+01	6.7E-05	2.1E+02	1.4E-05	6.6E+06	4.5E-10	1.3E+03	2.3E-06	2.4E+02	1.3E-05	7.0E+02	4.3E-06	8.3E+06	3.6E-10	2.3E+03	1.3E-06
PAOC04	VOC	Toluene	108-88-3	ID	6	2	3.00E-04	1.00E-03		2.5E+02	4.0E-06	2.8E+03	3.6E-07	2.7E+07	3.7E-11	2.5E+02	4.0E-06	2.5E+02	4.0E-06	3.3E+03	3.0E-07	1.2E+07	8.3E-11	2.5E+02	4.0E-06
PAOC04	VOC	Xylenes (total)	1330-20-7	ID	6	1	1.40E-03	1.40E-03		1.5E+02	9.3E-06	4.6E+04	3.0E-08	2.9E+08	4.8E-12	1.5E+02	9.3E-06	1.5E+02	9.3E-06	5.4E+04	2.6E-08	1.3E+08	1.1E-11	1.5E+02	9.3E-06
PAOC04	SVOC	Acenaphthene	83-32-9		6	1	1.80E-01	1.80E-01		1.9E+05	9.5E-07	8.1E+04	2.2E-06	1.4E+07	1.3E-08	4.1E+04	4.4E-06	3.5E+05	5.1E-07	9.7E+04	1.9E-06	6.2E+06	2.9E-08	1.3E+05	1.4E-06
PAOC04	SVOC	Acenaphthylene	208-96-8	D	6	1	2.90E-02	2.90E-02		1.6E+03	1.8E-05	2.2E+03	1.3E-05	2.3E+06	1.3E-08	1.6E+03	1.8E-05	3.0E+03	9.7E-06	2.7E+03	1.1E-05	1.0E+06	2.9E-08	5.2E+03	5.6E-06
PAOC04	SVOC	Anthracene	120-12-7	D	6	2	6.10E-02	5.60E-01		1.0E+06	5.6E-07	1.4E+06	4.0E-07	6.7E+07	8.4E-09	2.3E+05	2.4E-06	1.0E+06	5.6E-07	1.6E+06	3.5E-07	2.9E+07	1.9E-08	7.3E+05	7.7E-07
PAOC04	SVOC	Benzo(a)anthracene	56-55-3	B2	6	3	2.30E-02	6.90E-01								2.0E+01	3.5E-02							8.0E+01	8.6E-03
PAOC04	SVOC	Benzo(a)pyrene	50-32-8	B2	6	3	1.90E-02	4.60E-01						1.5E+03	3.1E-04	2.0E+00	2.3E-01					1.9E+03	2.4E-04	8.0E+00	5.8E-02
PAOC04	SVOC	Benzo(b)fluoranthene	205-99-2	B2	6	3	2.30E-02	4.30E-01								2.0E+01	2.2E-02							8.0E+01	5.4E-03
PAOC04	SVOC	Benzo(g,h,i)perylene	191-24-2	D	6	3	1.50E-02	3.80E-01						8.0E+05	4.8E-07	2.5E+03	1.5E-04					3.5E+05	1.1E-06	7.0E+03	5.4E-05
PAOC04	SVOC	Benzo(k)fluoranthene	207-08-9	B2	6	2	1.00E-02	2.20E-01								2.0E+02	1.1E-03							8.0E+02	2.8E-04
PAOC04	SVOC	Chrysene	218-01-9	B2	6	3	2.90E-02	9.60E-01								2.0E+03	4.8E-04							8.0E+03	1.2E-04
PAOC04	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	6	1	9.80E-02	9.80E-02								2.0E+00	4.9E-02							8.0E+00	1.2E-02
PAOC04	SVOC	Fluoranthene	206-44-0	D	6	2	4.00E-02	6.80E-01		1.0E+06	6.8E-07	7.4E+05	9.2E-07	9.3E+06	7.3E-08	4.6E+04	1.5E-05	1.0E+06	6.8E-07	8.9E+05	7.6E-07	4.1E+06	1.7E-07	1.3E+05	5.2E-06
PAOC04	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	6	3	1.20E-02	2.00E-01								2.0E+01	1.0E-02							8.0E+01	2.5E-03
PAOC04	SVOC	2-Methylnaphthalene	91-57-6	ID	6	2	8.60E-03	1.70E-01								8.1E+03	2.1E-05							2.6E+04	6.5E-06
PAOC04	SVOC	Naphthalene	91-20-3	C	6	1	7.40E-02	7.40E-02		2.5E+02	3.0E-04	3.0E+02	2.5E-04	2.0E+05	3.7E-07	1.6E+04	4.6E-06	4.7E+02	1.6E-04	3.5E+02	2.1E-04	8.8E+04	8.4E-07	5.2E+04	1.4E-06
PAOC04	SVOC	Phenanthrene	85-01-8	D	6	4	8.60E-03	1.50E+00		2.8E+03	5.4E-04	1.6E+02	9.4E-03	6.7E+03	2.2E-04	1.6E+03	9.4E-04	5.1E+03	2.9E-04	1.9E+02	7.9E-03	2.9E+03	5.2E-04	5.2E+03	2.9E-04
PAOC04	SVOC	Pyrene	129-00-0	NC	6	3	3.30E-02	1.80E+00		1.0E+06	1.8E-06	6.5E+05	2.8E-06	6.7E+06	2.7E-07	2.9E+04	6.2E-05	1.0E+06	1.8E-06	7.8E+05	2.3E-06	2.9E+06	6.2E-07	8.4E+04	2.1E-05
PAOC04	PCB	PCBs (total)	1336-36-3	B2	6	1	5.07E-02	5.07E-02		3.0E+03	1.7E-05	2.4E+02	2.1E-04	5.2E+03	9.8E-06	4.0E+00	1.3E-02	1.6E+04	3.2E-06	8.1E+02	6.3E-05	6.5E+03	7.8E-06	1.6E+01	3.2E-03
PAOC04	INORG	Antimony	7440-36-0		6	4	9.10E-02	3.20E-01						1.3E+04	2.5E-05	1.8E+02	1.8E-03					5.9E+03	5.4E-05	6.7E+02	4.8E-04
PAOC04	INORG	Arsenic	7440-38-2	A	6	6	3.30E+00	1.21E+01						7.2E+02	1.7E-02	7.6E+00									

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC05	VOC	Methylcyclohexane	108-87-2		11	3	5.80E-04	6.10E-02																	
PAOC05	VOC	Toluene	108-88-3	ID	123	19	3.00E-04	8.50E+02		2.5E+02	3.4E+00	2.8E+03	3.0E-01	2.7E+07	3.1E-05	2.5E+02	3.4E+00	2.5E+02	3.4E+00	3.3E+03	2.6E-01	1.2E+07	7.1E-05	2.5E+02	3.4E+00
PAOC05	VOC	Trichloroethene	79-01-6	C-B2	23	2	8.00E-04	1.10E-03		7.1E+00	1.5E-04	7.8E+01	1.4E-05	1.8E+06	6.1E-10	5.0E+02	2.2E-06	3.7E+01	3.0E-05	2.6E+02	4.2E-06	2.3E+06	4.8E-10	5.0E+02	2.2E-06
PAOC05	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	11	3	8.50E-04	2.50E+00		1.1E+02	2.3E-02	2.1E+04	1.2E-04	8.2E+07	3.0E-08	1.1E+02	2.3E-02	1.1E+02	2.3E-02	2.5E+04	1.0E-04	3.6E+07	6.9E-08	1.1E+02	2.3E-02
PAOC05	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	11	1	4.50E-01	4.50E-01		9.4E+01	4.8E-03	1.6E+04	2.8E-05	8.2E+07	5.5E-09	9.4E+01	4.8E-03	9.4E+01	4.8E-03	1.9E+04	2.4E-05	3.6E+07	1.3E-08	9.4E+01	4.8E-03
PAOC05	VOC	Xylenes (total)	1330-20-7	ID	123	26	5.90E-04	2.30E+04		1.5E+02	1.5E+02	4.6E+04	5.0E-01	2.9E+08	7.9E-05	1.5E+02	1.5E+02	1.5E+02	1.5E+02	5.4E+04	4.3E-01	1.3E+08	1.8E-04	1.5E+02	1.5E+02
PAOC05	SVOC	Acenaphthene	83-32-9		72	2	1.00E-01	2.10E-01		1.9E+05	1.1E-06	8.1E+04	2.6E-06	1.4E+07	1.5E-08	4.1E+04	5.1E-06	3.5E+05	6.0E-07	9.7E+04	2.2E-06	6.2E+06	3.4E-08	1.3E+05	1.6E-06
PAOC05	SVOC	Acenaphthylene	208-96-8	D	72	2	2.50E-02	4.70E-01		1.6E+03	2.9E-04	2.2E+03	2.1E-04	2.3E+06	2.0E-07	1.6E+03	2.9E-04	3.0E+03	1.6E-04	2.7E+03	1.7E-04	1.0E+06	4.7E-07	5.2E+03	9.0E-05
PAOC05	SVOC	Anthracene	120-12-7	D	72	2	2.30E-01	8.20E-01		1.0E+06	8.2E-07	1.4E+06	5.9E-07	6.7E+07	1.2E-08	2.3E+05	3.6E-06	1.0E+06	8.2E-07	1.6E+06	5.1E-07	2.9E+07	2.8E-08	7.3E+05	1.1E-06
PAOC05	SVOC	Benzo(a)anthracene	56-55-3	B2	72	5	1.50E-02	3.70E+00								2.0E+01	1.9E-01							8.0E+01	4.6E-02
PAOC05	SVOC	Benzo(a)pyrene	50-32-8	B2	72	5	1.20E-02	2.60E+00						1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC05	SVOC	Benzo(b)fluoranthene	205-99-2	B2	72	5	1.30E-02	3.60E+00								2.0E+01	1.8E-01							8.0E+01	4.5E-02
PAOC05	SVOC	Benzo(g,h,i)perylene	191-24-2	D	72	5	1.20E-02	1.50E+00						8.0E+05	1.9E-06	2.5E+03	6.0E-04					3.5E+05	4.3E-06	7.0E+03	2.1E-04
PAOC05	SVOC	Benzo(k)fluoranthene	207-08-9	B2	72	3	1.10E-02	1.30E+00								2.0E+02	6.5E-03							8.0E+02	1.6E-03
PAOC05	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	13	3	2.10E-02	6.10E-02						7.0E+05	8.7E-08	2.8E+03	2.2E-05					8.9E+05	6.9E-08	1.0E+04	6.1E-06
PAOC05	SVOC	Carbazole	86-74-8	B2	13	2	9.30E-02	2.00E-01								5.3E+02	3.8E-04							2.4E+03	8.3E-05
PAOC05	SVOC	Chrysene	218-01-9	B2	72	5	2.30E-02	2.90E+00								2.0E+03	1.5E-03							8.0E+03	3.6E-04
PAOC05	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	72	2	9.60E-02	4.30E-01								2.0E+00	2.2E-01							8.0E+00	5.4E-02
PAOC05	SVOC	Dibenzofuran	132-64-9	D	13	3	5.10E-02	2.20E-01																	
PAOC05	SVOC	Fluoranthene	206-44-0	D	72	6	2.30E-02	1.00E+01		1.0E+06	1.0E-05	7.4E+05	1.4E-05	9.3E+06	1.1E-06	4.6E+04	2.2E-04	1.0E+06	1.0E-05	8.9E+05	1.1E-05	4.1E+06	2.4E-06	1.3E+05	7.7E-05
PAOC05	SVOC	Fluorene	86-73-7	D	72	2	6.00E-02	2.80E-01		5.8E+05	4.8E-07	1.3E+05	2.2E-06	9.3E+06	3.0E-08	2.7E+04	1.0E-05	1.0E+06	2.8E-07	1.5E+05	1.9E-06	4.1E+06	6.8E-08	8.7E+04	3.2E-06
PAOC05	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	72	3	1.50E-02	1.40E+00								2.0E+01	7.0E-02							8.0E+01	1.8E-02
PAOC05	SVOC	2-Methylnaphthalene	91-57-6	ID	72	3	7.70E-03	2.20E-01								8.1E+03	2.7E-05							2.6E+04	8.5E-06
PAOC05	SVOC	Naphthalene	91-20-3	C	72	3	6.40E-02	1.60E-01		2.5E+02	6.4E-04	3.0E+02	5.3E-04	2.0E+05	8.0E-07	1.6E+04	1.0E-05	4.7E+02	3.4E-04	3.5E+02	4.6E-04	8.8E+04	1.8E-06	5.2E+04	3.1E-06
PAOC05	SVOC	Phenanthrene	85-01-8	D	72	9	8.90E-03	3.40E+00		2.8E+03	1.2E-03	1.6E+02	2.1E-02	6.7E+03	5.1E-04	1.6E+03	2.1E-03	5.1E+03	6.7E-04	1.9E+02	1.8E-02	2.9E+03	1.2E-03	5.2E+03	6.5E-04
PAOC05	SVOC	Pyrene	129-00-0	NC	72	6	2.50E-02	8.10E+00		1.0E+06	8.1E-06	6.5E+05	1.2E-05	6.7E+06	1.2E-06	2.9E+04	2.8E-04	1.0E+06	8.1E-06	7.8E+05	1.0E-05	2.9E+06	2.8E-06	8.4E+04	9.6E-05
PAOC05	PCB	PCBs (total)	1336-36-3	B2	72	4	5.40E-02	6.70E-01		3.0E+03	2.2E-04	2.4E+02	2.8E-03	5.2E+03	1.3E-04	4.0E+00	1.7E-01	1.6E+04	4.2E-05	8.1E+02	8.3E-04	6.5E+03	1.0E-04	1.6E+01	4.2E-02
PAOC05	INORG	Antimony	7440-36-0		13	10	4.30E-02	5.30E-01						1.3E+04	4.1E-05	1.8E+02	2.9E-03					5.9E+03	9.0E-05	6.7E+02	7.9E-04
PAOC05	INORG	Arsenic	7440-38-2	A	13	13	1.10E+00	7.40E+00						7.2E+02	1.0E-02	7.6E+00	9.7E-01					9.1E+02	8.1E-03	3.7E+01	2.0E-01
PAOC05	INORG	Barium	7440-39-3	NC	13	13	1.52E+01	1.30E+02						3.3E+05	3.9E-04	3.7E+04	3.5E-03					1.5E+05	8.7E-04	1.3E+05	1.0E-03
PAOC05	INORG	Beryllium	7440-41-7	B1	13	8	1.50E-01	1.10E+00						1.3E+03	8.5E-04	4.1E+02	2.7E-03					5.9E+02	1.9E-03	1.6E+03	6.9E-04
PAOC05	INORG	Cadmium	7440-43-9	B1	78	72	1.60E-01	7.20E+00						1.7E+03	4.2E-03	5.5E+02	1.3E-02					2.2E+03	3.3E-03	2.1E+03	3.4E-03
PAOC05	INORG	Chromium (total)	7440-47-3		65	65	6.00E+00	2.70E+01						2.6E+02	1.0E-01	2.5E+03	1.1E-02					2.4E+02	1.1E-01	9.2E+03	2.9E-03
PAOC05	INORG	Chromium III	16065-83-1	D	13	13	6.18E+00	3.31E+01						3.3E+05	1.0E-04	7.9E+05	4.2E-05					1.5E+05	2.2E-04	1.0E+06	3.3E-05
PAOC05	INORG	Chromium VI	18540-29-9	A	13	7	4.10E-01	1.80E+00						2.6E+02	6.9E-03	2.5E+03	7.2E-04					2.4E+02	7.5E-03	9.2E+03	2.0E-04
PAOC05	INORG	Cobalt	7440-48-4	LC	13	13	2.60E+00	8.90E+00						1.3E+04	6.8E-04	2.6E+03	3.4E-03					5.9E+03	1.5E-03	9.0E+03	9.9E-04
PAOC05	INORG	Copper	7440-50-8	D	13	13	8.10E+00	1.42E+02						1.3E+05	1.1E-03	2.0E+04	7.1E-03					5.9E+04	2.4E-03	7.3E+04	1.9E-03
PAOC05	INORG	Cyanide (total)	57-12-5	D	13	1	6.40E-01	6.40E-01						2.5E+02	2.6E-03	1.2E+01	5.3E-02					2.5E+02	2.6E-03	2.5E+02	2.6E-03
PAOC05	INORG	Lead	7439-92-1	B2	78	78	2.10E+00	1.94E+01						1.0E+05	1.9E-04	4.0E+02	4.9E-02					4.4E+04	4.4E-04	9.0E+02	2.2E-02
PAOC05	INORG	Manganese	7439-96-5	D	13	13	1.30E+02	9.21E+02	4.40E+02					3.3E+03	1.5E-01	2.5E+04	1.9E-02					1.5E+03	3.2E-01	9.0E+04	5.3E-03
PAOC05	INORG	Mercury	7439-97-6	D	13	8	1.90E-02	1.00E-01		4.8E+01	2.1E-03	5.2E+01	1.9E-03	2.0E+04	5.0E-06	1.6E+02	6.3E-04	8.9E+01	1.1E-03	6.2E+01	1.6E-03	8.8E+03	1.1E-05	5.8E+02	1.7E-04
PAOC05	INORG	Nickel	7440-02-0	A	13	13	5.70E+00	2.48E+01						1.3E+04	1.9E-03	4.0E+04	6.2E-04					1.6E+04	1.6E-03	1.5E+05	1.7E-04
PAOC05	INORG	Selenium	7782-49-2	D	13	7	1.50E-01	5.70E-01						1.3E+05	4.4E-06	2.6E+03	2.2E-04					5.9E+04	9.7E-06	9.6E+03	5.9E-05
PAOC05	INORG	Silver	7440-22-4	D	13	13	3.00E-02	1.80E-01						6.7E+03	2.7E-05	2.5E+03	7.2E-05					2.9E+03	6.2E-05	9.0E+03	2.0E-05
PAOC05	INORG	Thallium	7440-28-0		13	12	4.10E-02	2.70E-01								3.5E+01	7.7E-03							1.3E+02	2.1E-03
PAOC05	INORG	Vanadium	7440-62-2		13	13	1.02E+01	2.45E+01								7.5E+02	3.3E-02							5.5E+03	4.5E-03
PAOC05	INORG	Zinc	7440-66-6	ID	13	13	1.46E+01	5.28E+01								1.7E+05	3.1E-04							6.3E+05	8.4E-05
PAOC06	VOC	Acetone	67-64-1	ID	9	2	7.00E-03	8.10E-03		1.1E+05	7.4E-08	1.3E+05	6.2E-08	3.9E+08	2.1E-11	2.3E+04	3.5E-07	1.1E+05	7.4E-08	1.6E+05	5.1E-08	1.7E+08	4.8E-11	7.3E+04	1.1E-07
PAOC06	VOC	Benzene	71-43-2	A	9	1	2.20E-04	2.20E-04		1.6E+00	1.4E-04	1.3E+01	1.7E-05	3.8E+05	5.8E-10	1.8E+02	1.2E-06	8.4E+00	2.6E-05	4.5E+01	4.9E-06	4.7E+05	4.7E-10	4.0E+02	5.5E-07
PAOC06	VOC	2-Butanone	78-93-3	ID	9	1	1.90E-03	1.90E-03		2.7E+04	7.0E-08	2.9E+04	6.6E-08	6.7E+07	2.8E-11	2.7E+04	7.0E-08	2.7E+04	7.0E-08	3.5E+04	5.4E-08	2.9E+07	6.6E-11	2.7E+04	7.0E-08
PAOC06	VOC	Carbon Disulfide	75-15-0		9	1	4.10E-03	4.10E-03		7.6E+01	5.4E-05	1.3E+03	3.2E-06	4.7E+07	8.7E-11	2.8E+02	1.5E-05	1.4E+02	2.9E-05	1.6E+03	2.6E				

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC06	INORG	Mercury	7439-97-6	D	9	7	1.80E-02	6.30E-02		4.8E+01	1.3E-03	5.2E+01	1.2E-03	2.0E+04	3.2E-06	1.6E+02	3.9E-04	8.9E+01	7.1E-04	6.2E+01	1.0E-03	8.8E+03	7.2E-06	5.8E+02	1.1E-04
PAOC06	INORG	Nickel	7440-02-0	A	9	9	8.00E+00	1.71E+01						1.3E+04	1.3E-03	4.0E+04	4.3E-04					1.6E+04	1.1E-03	1.5E+05	1.1E-04
PAOC06	INORG	Selenium	7782-49-2	D	9	8	1.00E-01	9.00E-01						1.3E+05	6.9E-06	2.6E+03	3.5E-04					5.9E+04	1.5E-05	9.6E+03	9.4E-05
PAOC06	INORG	Silver	7440-22-4	D	9	4	3.70E-02	1.00E-01						6.7E+03	1.5E-05	2.5E+03	4.0E-05					2.9E+03	3.4E-05	9.0E+03	1.1E-05
PAOC06	INORG	Thallium	7440-28-0		9	7	7.90E-02	2.60E-01								3.5E+01	7.4E-03							1.3E+02	2.0E-03
PAOC06	INORG	Vanadium	7440-62-2		9	9	8.20E+00	2.05E+01								7.5E+02	2.7E-02							5.5E+03	3.7E-03
PAOC06	INORG	Zinc	7440-66-6	ID	9	9	1.72E+01	6.34E+01								1.7E+05	3.7E-04							6.3E+05	1.0E-04
PAOC07	VOC	Acetone	67-64-1	ID	1	1	1.20E-02	1.20E-02		1.1E+05	1.1E-07	1.3E+05	9.2E-08	3.9E+08	3.1E-11	2.3E+04	5.2E-07	1.1E+05	1.1E-07	1.6E+05	7.5E-08	1.7E+08	7.1E-11	7.3E+04	1.6E-07
PAOC07	VOC	2-Butanone	78-93-3	ID	1	1	2.60E-03	2.60E-03		2.7E+04	9.6E-08	2.9E+04	9.0E-08	6.7E+07	3.9E-11	2.7E+04	9.6E-08	2.7E+04	9.6E-08	3.5E+04	7.4E-08	2.9E+07	9.0E-11	2.7E+04	9.6E-08
PAOC07	INORG	Antimony	7440-36-0		1	1	7.20E-02	7.20E-02						1.3E+04	5.5E-06	1.8E+02	4.0E-04					5.9E+03	1.2E-05	6.7E+02	1.1E-04
PAOC07	INORG	Arsenic	7440-38-2	A	1	1	5.00E+00	5.00E+00						7.2E+02	6.9E-03	7.6E+00	6.6E-01					9.1E+02	5.5E-03	3.7E+01	1.4E-01
PAOC07	INORG	Barium	7440-39-3	NC	1	1	7.12E+01	7.12E+01						3.3E+05	2.2E-04	3.7E+04	1.9E-03					1.5E+05	4.7E-04	1.3E+05	5.5E-04
PAOC07	INORG	Beryllium	7440-41-7	B1	1	1	3.50E-01	3.50E-01						1.3E+03	2.7E-04	4.1E+02	8.5E-04					5.9E+02	5.9E-04	1.6E+03	2.2E-04
PAOC07	INORG	Chromium III	16065-83-1	D	1	1	1.71E+01	1.71E+01						3.3E+05	5.2E-05	7.9E+05	2.2E-05					1.5E+05	1.1E-04	1.0E+06	1.7E-05
PAOC07	INORG	Chromium VI	18540-29-9	A	1	1	7.80E-01	7.80E-01						2.6E+02	3.0E-03	2.5E+03	3.1E-04					2.4E+02	3.3E-03	9.2E+03	8.5E-05
PAOC07	INORG	Cobalt	7440-48-4	LC	1	1	9.10E+00	9.10E+00						1.3E+04	7.0E-04	2.6E+03	3.5E-03					5.9E+03	1.5E-03	9.0E+03	1.0E-03
PAOC07	INORG	Copper	7440-50-8	D	1	1	1.43E+01	1.43E+01						1.3E+05	1.1E-04	2.0E+04	7.2E-04					5.9E+04	2.4E-04	7.3E+04	2.0E-04
PAOC07	INORG	Lead	7439-92-1	B2	1	1	1.25E+01	1.25E+01						1.0E+05	1.3E-04	4.0E+02	3.1E-02					4.4E+04	2.8E-04	9.0E+02	1.4E-02
PAOC07	INORG	Manganese	7439-96-5	D	1	1	4.27E+02	4.27E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC07	INORG	Mercury	7439-97-6	D	1	1	4.50E-02	4.50E-02		4.8E+01	9.4E-04	5.2E+01	8.7E-04	2.0E+04	2.3E-06	1.6E+02	2.8E-04	8.9E+01	5.1E-04	6.2E+01	7.3E-04	8.8E+03	5.1E-06	5.8E+02	7.8E-05
PAOC07	INORG	Nickel	7440-02-0	A	1	1	2.20E+01	2.20E+01						1.3E+04	1.7E-03	4.0E+04	5.5E-04					1.6E+04	1.4E-03	1.5E+05	1.5E-04
PAOC07	INORG	Selenium	7782-49-2	D	1	1	1.20E-01	1.20E-01						1.3E+05	9.2E-07	2.6E+03	4.6E-05					5.9E+04	2.0E-06	9.6E+03	1.3E-05
PAOC07	INORG	Silver	7440-22-4	D	1	1	7.70E-02	7.70E-02						6.7E+03	1.1E-05	2.5E+03	3.1E-05					2.9E+03	2.7E-05	9.0E+03	8.6E-06
PAOC07	INORG	Thallium	7440-28-0		1	1	1.70E-01	1.70E-01								3.5E+01	4.9E-03							1.3E+02	1.3E-03
PAOC07	INORG	Vanadium	7440-62-2		1	1	2.36E+01	2.36E+01								7.5E+02	3.1E-02							5.5E+03	4.3E-03
PAOC07	INORG	Zinc	7440-66-6	ID	1	1	4.05E+01	4.05E+01								1.7E+05	2.4E-04							6.3E+05	6.4E-05
PAOC08	VOC	Acetone	67-64-1	ID	1	1	1.30E-02	1.30E-02		1.1E+05	1.2E-07	1.3E+05	1.0E-07	3.9E+08	3.3E-11	2.3E+04	5.7E-07	1.1E+05	1.2E-07	1.6E+05	8.1E-08	1.7E+08	7.6E-11	7.3E+04	1.8E-07
PAOC08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	1	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC08	INORG	Antimony	7440-36-0		1	1	4.90E-02	4.90E-02						1.3E+04	3.8E-06	1.8E+02	2.7E-04					5.9E+03	8.3E-06	6.7E+02	7.3E-05
PAOC08	INORG	Arsenic	7440-38-2	A	1	1	7.40E+00	7.40E+00						7.2E+02	1.0E-02	7.6E+00	9.7E-01					9.1E+02	8.1E-03	3.7E+01	2.0E-01
PAOC08	INORG	Barium	7440-39-3	NC	1	1	4.36E+01	4.36E+01						3.3E+05	1.3E-04	3.7E+04	1.2E-03					1.5E+05	2.9E-04	1.3E+05	3.4E-04
PAOC08	INORG	Beryllium	7440-41-7	B1	1	1	3.60E-01	3.60E-01						1.3E+03	2.8E-04	4.1E+02	8.8E-04					5.9E+02	6.1E-04	1.6E+03	2.3E-04
PAOC08	INORG	Cadmium	7440-43-9	B1	1	1	2.30E-01	2.30E-01						1.7E+03	1.4E-04	5.5E+02	4.2E-04					2.2E+03	1.0E-04	2.1E+03	1.1E-04
PAOC08	INORG	Chromium III	16065-83-1	D	1	1	1.16E+01	1.16E+01						3.3E+05	3.5E-05	7.9E+05	1.5E-05					1.5E+05	7.7E-05	1.0E+06	1.2E-05
PAOC08	INORG	Chromium VI	18540-29-9	A	1	1	1.20E+00	1.20E+00						2.6E+02	4.6E-03	2.5E+03	4.8E-04					2.4E+02	5.0E-03	9.2E+03	1.3E-04
PAOC08	INORG	Cobalt	7440-48-4	LC	1	1	6.80E+00	6.80E+00						1.3E+04	5.2E-04	2.6E+03	2.6E-03					5.9E+03	1.2E-03	9.0E+03	7.6E-04
PAOC08	INORG	Copper	7440-50-8	D	1	1	1.38E+01	1.38E+01						1.3E+05	1.1E-04	2.0E+04	6.9E-04					5.9E+04	2.3E-04	7.3E+04	1.9E-04
PAOC08	INORG	Lead	7439-92-1	B2	1	1	5.50E+00	5.50E+00						1.0E+05	5.5E-05	4.0E+02	1.4E-02					4.4E+04	1.3E-04	9.0E+02	6.1E-03
PAOC08	INORG	Manganese	7439-96-5	D	1	1	3.08E-02	3.08E-02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC08	INORG	Mercury	7439-97-6	D	1	1	1.90E-02	1.90E-02		4.8E+01	4.0E-04	5.2E+01	3.7E-04	2.0E+04	9.5E-07	1.6E+02	1.2E-04	8.9E+01	2.1E-04	6.2E+01	3.1E-04	8.8E+03	2.2E-06	5.8E+02	3.3E-05
PAOC08	INORG	Nickel	7440-02-0	A	1	1	1.63E+01	1.63E+01						1.3E+04	1.3E-03	4.0E+04	4.1E-04					1.6E+04	1.0E-03	1.5E+05	1.1E-04
PAOC08	INORG	Selenium	7782-49-2	D	1	1	3.70E-01	3.70E-01						1.3E+05	2.8E-06	2.6E+03	1.4E-04					5.9E+04	6.3E-06	9.6E+03	3.9E-05
PAOC08	INORG	Thallium	7440-28-0		1	1	1.20E-01	1.20E-01								3.5E+01	3.4E-03							1.3E+02	9.2E-04
PAOC08	INORG	Vanadium	7440-62-2		1	1	1.76E+01	1.76E+01								7.5E+02	2.3E-02							5.5E+03	3.2E-03
PAOC08	INORG	Zinc	7440-66-6	ID	1	1	2.86E+01	2.86E+01								1.7E+05	1.7E-04							6.3E+05	4.5E-05
PAOC09	VOC	cis-1,2-Dichloroethene	156-59-2	ID	3	2	4.10E-01	7.30E-01		2.2E+01	3.3E-02	1.8E+02	4.1E-03	2.3E+06	3.2E-07	6.4E+02	1.1E-03	4.1E+01	1.8E-02	2.1E+02	3.5E-03	1.0E+06	7.3E-07	6.4E+02	1.1E-03
PAOC09	VOC	trans-1,2-Dichloroethene	156-60-5		3	2	4.80E-02	9.00E-02		2.3E+01	3.9E-03	2.8E+02	3.2E-04	4.7E+06	1.9E-08	1.4E+03	6.4E-05	4.3E+01	2.1E-03	3.3E+02	2.7E-04	2.1E+06	4.3E-08	1.4E+03	6.4E-05
PAOC09	VOC	Toluene	108-88-3	ID	3	1	2.90E-04	2.90E-04		2.5E+02	1.2E-06	2.8E+03	1.0E-07	2.7E+07	1.1E-11	2.5E+02	1.2E-06	2.5E+02	1.2E-06	3.3E+03	8.8E-08	1.2E+07	2.4E-11	2.5E+02	1.2E-06
PAOC09	VOC	Trichloroethene	79-01-6	C-B2	3	2	1.20E-01	2.20E-01		7.1E+00	3.1E-02	7.8E+01	2.8E-03	1.8E+06	1.2E-07	5.0E+02	4.4E-04	3.7E+01	5.9E-03	2.6E+02	8.5E-04	2.3E+06	9.6E-08	5.0E+02	4.4E-04
PAOC09	VOC	Vinyl Chloride	75-01-4	A	3	2	4.50E-02	6.60E-02		2.7E-01	2.4E-01	4.2E+00	1.6E-02	3.5E+05	1.9E-07	3.8E+00	1.7E-02	2.8E+00	2.4E-02	2.9E+01	2.3E-03	8.9E+05	7.4E-08	3.4E+01	1.9E-03
PAOC09	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	3	1	3.00E-02	3.00E-02						7.0E+05	4.3E-08	2.8E+03	1.1E-05					8.9E+05	3.4E-08	1.0E+04	3.0E-06
PAOC09	SVOC	Fluoranthene	206-44-0	D	3	2	9.50E-03	9.60E-03		1.0E+06	9.6E-09	7.4E+05	1.3E-08	9.3E+06	1.0E-09	4.6E+04	2.1E-07	1.0E+06	9.6E-09	8.9E+05	1.1E-08	4.1E+06	2.3E-09	1.3E+05	7.4E-08
PAOC09	SVOC	Phenanthrene	85-01-8	D	3	2	7.50E-03	7.80E-03		2.8E+03	2.8E-06	1.6E+02	4.9E-05	6.7											

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC10	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	2	1	5.20E-02	5.20E-02		1.1E+02	4.7E-04	2.1E+04	2.5E-06	8.2E+07	6.3E-10	1.1E+02	4.7E-04	1.1E+02	4.7E-04	2.5E+04	2.1E-06	3.6E+07	1.4E-09	1.1E+02	4.7E-04
PAOC10	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	2	1	5.30E-02	5.30E-02		9.4E+01	5.6E-04	1.6E+04	3.3E-06	8.2E+07	6.5E-10	9.4E+01	5.6E-04	9.4E+01	5.6E-04	1.9E+04	2.8E-06	3.6E+07	1.5E-09	9.4E+01	5.6E-04
PAOC10	VOC	Xylenes (total)	1330-20-7	ID	2	1	8.10E-02	8.10E-02		1.5E+02	5.4E-04	4.6E+04	1.8E-06	2.9E+08	2.8E-10	1.5E+02	5.4E-04	1.5E+02	5.4E-04	5.4E+04	1.5E-06	1.3E+08	6.2E-10	1.5E+02	5.4E-04
PAOC10	SVOC	Acenaphthene	83-32-9		2	1	1.30E+00	1.30E+00		1.9E+05	6.8E-06	8.1E+04	1.6E-05	1.4E+07	9.3E-08	4.1E+04	3.2E-05	3.5E+05	3.7E-06	9.7E+04	1.3E-05	6.2E+06	2.1E-07	1.3E+05	1.0E-05
PAOC10	SVOC	Benzo(b)fluoranthene	205-99-2	B2	2	1	1.20E-02	1.20E-02								2.0E+01	6.0E-04							8.0E+01	1.5E-04
PAOC10	SVOC	Biphenyl	92-52-4	D	2	1	9.30E-01	9.30E-01																	
PAOC10	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	1	5.70E-01	5.70E-01						7.0E+05	8.1E-07	2.8E+03	2.0E-04					8.9E+05	6.4E-07	1.0E+04	5.7E-05
PAOC10	SVOC	Chrysene	218-01-9	B2	2	1	1.80E-01	1.80E-01								2.0E+03	9.0E-05							8.0E+03	2.3E-05
PAOC10	SVOC	Fluoranthene	206-44-0	D	2	1	3.10E-01	3.10E-01		1.0E+06	3.1E-07	7.4E+05	4.2E-07	9.3E+06	3.3E-08	4.6E+04	6.7E-06	1.0E+06	3.1E-07	8.9E+05	3.5E-07	4.1E+06	7.6E-08	1.3E+05	2.4E-06
PAOC10	SVOC	2-Methylnaphthalene	91-57-6	ID	2	2	2.10E-02	2.40E+00								8.1E+03	3.0E-04							2.6E+04	9.2E-05
PAOC10	SVOC	Naphthalene	91-20-3	C	2	2	1.20E-02	1.60E+00		2.5E+02	6.4E-03	3.0E+02	5.3E-03	2.0E+05	8.0E-06	1.6E+04	1.0E-04	4.7E+02	3.4E-03	3.5E+02	4.6E-03	8.8E+04	1.8E-05	5.2E+04	3.1E-05
PAOC10	SVOC	Phenanthrene	85-01-8	D	2	2	9.20E-03	2.60E+00		2.8E+03	9.3E-04	1.6E+02	1.6E-02	6.7E+03	3.9E-04	1.6E+03	1.6E-03	5.1E+03	5.1E-04	1.9E+02	1.4E-02	2.9E+03	9.0E-04	5.2E+03	5.0E-04
PAOC10	SVOC	Pyrene	129-00-0	NC	2	1	5.60E-01	5.60E+01		1.0E+06	5.6E-07	6.5E+05	8.6E-07	6.7E+06	8.4E-08	2.9E+04	1.9E-05	1.0E+06	5.6E-07	7.8E+05	7.2E-07	2.9E+06	1.9E-07	8.4E+04	6.7E-06
PAOC10	INORG	Arsenic	7440-38-2	A	2	2	3.10E+00	3.80E+00						7.2E+02	5.3E-03	7.6E+00	5.0E-01					9.1E+02	4.2E-03	3.7E+01	1.0E-01
PAOC10	INORG	Barium	7440-39-3	NC	2	2	6.30E+00	3.59E+01						3.3E+05	1.1E-04	3.7E+04	9.7E-04					1.5E+05	2.4E-04	1.3E+05	2.8E-04
PAOC10	INORG	Chromium III	16065-83-1	D	2	2	3.89E+00	9.98E+00						3.3E+05	3.0E-05	7.9E+05	1.3E-05					1.5E+05	6.7E-05	1.0E+06	1.0E-05
PAOC10	INORG	Cobalt	7440-48-4	LC	2	2	1.80E+00	5.40E+00						1.3E+04	4.2E-04	2.6E+03	2.1E-03					5.9E+03	9.2E-04	9.0E+03	6.0E-04
PAOC10	INORG	Copper	7440-50-8	D	2	2	3.80E+00	1.02E+01						1.3E+05	7.8E-05	2.0E+04	5.1E-04					5.9E+04	1.7E-04	7.3E+04	1.4E-04
PAOC10	INORG	Lead	7439-92-1	B2	2	2	3.20E+00	6.50E+00						1.0E+05	6.5E-05	4.0E+02	1.6E-02					4.4E+04	1.5E-04	9.0E+02	7.2E-03
PAOC10	INORG	Manganese	7439-96-5	D	2	2	1.16E+02	2.14E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC10	INORG	Nickel	7440-02-0	A	2	2	3.70E+00	1.32E+01						1.3E+04	1.0E-03	4.0E+04	3.3E-04					1.6E+04	8.3E-04	1.5E+05	8.8E-05
PAOC10	INORG	Selenium	7782-49-2	D	2	1	4.60E-01	4.60E-01						1.3E+05	3.5E-06	2.6E+03	1.8E-04					5.9E+04	7.8E-06	9.6E+03	4.8E-05
PAOC10	INORG	Silver	7440-22-4	D	2	2	2.10E-02	2.40E-02						6.7E+03	3.6E-06	2.5E+03	9.6E-06					2.9E+03	8.3E-06	9.0E+03	2.7E-06
PAOC10	INORG	Thallium	7440-28-0		2	1	1.20E-01	1.20E-01								3.5E+01	3.4E-03							1.3E+02	9.2E-04
PAOC10	INORG	Vanadium	7440-62-2		2	2	6.40E+00	1.31E+01								7.5E+02	1.7E-02							5.5E+03	2.4E-03
PAOC10	INORG	Zinc	7440-66-6	ID	2	2	2.01E+01	3.28E+01								1.7E+05	1.9E-04							6.3E+05	5.2E-05
PAOC11	VOC	Acetone	67-64-1	ID	1	1	6.00E-02	6.00E-02		1.1E+05	5.5E-07	1.3E+05	4.6E-07	3.9E+08	1.5E-10	2.3E+04	2.6E-06	1.1E+05	5.5E-07	1.6E+05	3.8E-07	1.7E+08	3.5E-10	7.3E+04	8.2E-07
PAOC11	VOC	2-Butanone	78-93-3	ID	1	1	1.50E-02	1.50E-02		2.7E+04	5.6E-07	2.9E+04	5.2E-07	6.7E+07	2.2E-10	2.7E+04	5.6E-07	2.7E+04	5.6E-07	3.5E+04	4.3E-07	2.9E+07	5.2E-10	2.7E+04	5.6E-07
PAOC11	SVOC	Benzo(b)fluoranthene	205-99-2	B2	1	1	8.10E-03	8.10E-03								2.0E+01	4.1E-04							8.0E+01	1.0E-04
PAOC11	SVOC	Fluoranthene	206-44-0	D	1	1	1.10E-02	1.10E-02		1.0E+06	1.1E-08	7.4E+05	1.5E-08	9.3E+06	1.2E-09	4.6E+04	2.4E-07	1.0E+06	1.1E-08	8.9E+05	1.2E-08	4.1E+06	2.7E-09	1.3E+05	8.5E-08
PAOC11	SVOC	Naphthalene	91-20-3	C	1	1	8.50E-03	8.50E-03		2.5E+02	3.4E-05	3.0E+02	2.8E-05	2.0E+05	4.3E-08	1.6E+04	5.3E-07	4.7E+02	1.8E-05	3.5E+02	2.4E-05	8.8E+04	9.7E-08	5.2E+04	1.6E-07
PAOC11	SVOC	Phenanthrene	85-01-8	D	1	1	9.10E-03	9.10E-03		2.8E+03	3.3E-06	1.6E+02	5.7E-05	6.7E+03	1.4E-06	1.6E+03	5.7E-06	5.1E+03	1.8E-06	1.9E+02	4.8E-05	2.9E+03	3.1E-06	5.2E+03	1.8E-06
PAOC11	SVOC	Pyrene	129-00-0	NC	1	1	1.00E-02	1.00E-02		1.0E+06	1.0E-08	6.5E+05	1.5E-08	6.7E+06	1.5E-09	2.9E+04	3.4E-07	1.0E+06	1.0E-08	7.8E+05	1.3E-08	2.9E+06	3.4E-09	8.4E+04	1.2E-07
PAOC11	INORG	Antimony	7440-36-0		1	1	5.50E+00	5.50E+00						1.3E+04	4.2E-04	1.8E+02	3.1E-02					5.9E+03	9.3E-04	6.7E+02	8.2E-03
PAOC11	INORG	Arsenic	7440-38-2	A	1	1	5.50E+00	5.50E+00						7.2E+02	7.6E-03	7.6E+00	7.2E-01					9.1E+02	6.0E-03	3.7E+01	1.5E-01
PAOC11	INORG	Barium	7440-39-3	NC	1	1	7.16E+01	7.16E+01						3.3E+05	2.2E-04	3.7E+04	1.9E-03					1.5E+05	4.8E-04	1.3E+05	5.5E-04
PAOC11	INORG	Beryllium	7440-41-7	B1	1	1	4.10E-01	4.10E-01						1.3E+03	3.2E-04	4.1E+02	1.0E-03					5.9E+02	6.9E-04	1.6E+03	2.6E-04
PAOC11	INORG	Cadmium	7440-43-9	B1	1	1	2.80E-01	2.80E-01						1.7E+03	1.6E-04	5.5E+02	5.1E-04					2.2E+03	1.3E-04	2.1E+03	1.3E-04
PAOC11	INORG	Chromium III	16065-83-1	D	1	1	1.03E+01	1.03E+01						3.3E+05	3.1E-05	7.9E+05	1.3E-05					1.5E+05	6.9E-05	1.0E+06	1.0E-05
PAOC11	INORG	Chromium VI	18540-29-9	A	1	1	5.70E-01	5.70E-01						2.6E+02	2.2E-03	2.5E+03	2.3E-04					2.4E+02	2.4E-03	9.2E+03	6.2E-05
PAOC11	INORG	Cobalt	7440-48-4	LC	1	1	5.20E+00	5.20E+00						1.3E+04	4.0E-04	2.6E+03	2.0E-03					5.9E+03	8.8E-04	9.0E+03	5.8E-04
PAOC11	INORG	Copper	7440-50-8	D	1	1	2.84E+02	2.84E+02						1.3E+05	2.2E-03	2.0E+04	1.4E-02					5.9E+04	4.8E-03	7.3E+04	3.9E-03
PAOC11	INORG	Lead	7439-92-1	B2	1	1	3.01E+02	3.01E+02						1.0E+05	3.0E-03	4.0E+02	7.5E-01					4.4E+04	6.8E-03	9.0E+02	3.3E-01
PAOC11	INORG	Manganese	7439-96-5	D	1	1	4.41E+02	4.41E+02	4.40E+02					3.3E+03	3.0E-04	2.5E+04	4.0E-05					1.5E+03	6.7E-04	9.0E+04	1.1E-05
PAOC11	INORG	Mercury	7439-97-6	D	1	1	3.40E-02	3.40E-02		4.8E+01	7.1E-04	5.2E+01	6.5E-04	2.0E+04	1.7E-06	1.6E+02	2.1E-04	8.9E+01	3.8E-04	6.2E+01	5.5E-04	8.8E+03	3.9E-06	5.8E+02	5.9E-05
PAOC11	INORG	Nickel	7440-02-0	A	1	1	7.00E+00	7.00E+00						1.3E+04	5.4E-04	4.0E+04	1.8E-04					1.6E+04	4.4E-04	1.5E+05	4.7E-05
PAOC11	INORG	Selenium	7782-49-2	D	1	1	3.70E-01	3.70E-01						1.3E+05	2.8E-06	2.6E+03	1.4E-04					5.9E+04	6.3E-06	9.6E+03	3.9E-05
PAOC11	INORG	Vanadium	7440-62-2		1	1	2.37E+01	2.37E+01								7.5E+02	3.2E-02							5.5E+03	4.3E-03
PAOC11	INORG	Zinc	7440-66-6	ID	1	1	2.54E+01	2.54E+01								1.7E+05	1.5E-04							6.3E+05	4.0E-05
PAOC11/PAOC14	INORG	Arsenic	7440-38-2	A	1	1	1.50E+00	1.50E+00						7.2E+02	2.1E-03	7.6E+00	2.0E-01					9.1E+02	1.6E-03	3.7E+01	4.1E-02
PAOC11/PAOC14	INORG	Barium	7440-39-3	NC	1	1	3.80E+01	3.80E+01						3.3E+05	1.2E-04	3.7E+04	1.0E-03					1.5E+05	2.5E-04	1.3E+05	2.9E-04
PAOC11/PAOC14	INORG	Beryllium	7440-41-7	B1	1	1	4.40E-01	4.40E-01						1.3E+03											

Table 1a: Screening Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/kg)	Max Detected (mg/kg)	Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Max Detect to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Max Detect to Res VSIC	Residential PSIC (mg/kg)	Ratio of Max Detect to Res PSIC	Residential DCC (mg/kg)	Ratio of Max Detect to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Max Detect to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Max Detect to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Max Detect to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Max Detect to Industrial II DCC
PAOC12	INORG	Chromium VI	18540-29-9	A	2	2	1.20E+00	1.70E+00						2.6E+02	6.5E-03	2.5E+03	6.8E-04					2.4E+02	7.1E-03	9.2E+03	1.8E-04
PAOC12	INORG	Cobalt	7440-48-4	LC	2	2	7.20E+00	8.20E+00						1.3E+04	6.3E-04	2.6E+03	3.2E-03					5.9E+03	1.4E-03	9.0E+03	9.1E-04
PAOC12	INORG	Copper	7440-50-8	D	2	2	6.71E+01	1.13E+02						1.3E+05	8.7E-04	2.0E+04	5.7E-03					5.9E+04	1.9E-03	7.3E+04	1.5E-03
PAOC12	INORG	Lead	7439-92-1	B2	3	3	1.45E+01	4.46E+02						1.0E+05	4.5E-03	4.0E+02	1.1E+00					4.4E+04	1.0E-02	9.0E+02	5.0E-01
PAOC12	INORG	Manganese	7439-96-5	D	2	2	3.17E+02	4.69E+02	4.40E+02					3.3E+03	8.8E-03	2.5E+04	1.2E-03					1.5E+03	1.9E-02	9.0E+04	3.2E-04
PAOC12	INORG	Mercury	7439-97-6	D	2	2	3.90E-01	4.40E-01		4.8E+01	9.2E-03	5.2E+01	8.5E-03	2.0E+04	2.2E-05	1.6E+02	2.8E-03	8.9E+01	4.9E-03	6.2E+01	7.1E-03	8.8E+03	5.0E-05	5.8E+02	7.6E-04
PAOC12	INORG	Nickel	7440-02-0	A	2	2	2.00E+01	2.88E+01						1.3E+04	2.2E-03	4.0E+04	7.2E-04					1.6E+04	1.8E-03	1.5E+05	1.9E-04
PAOC12	INORG	Selenium	7782-49-2	D	2	2	1.50E-01	3.30E-01						1.3E+05	2.5E-06	2.6E+03	1.3E-04					5.9E+04	5.6E-06	9.6E+03	3.4E-05
PAOC12	INORG	Silver	7440-22-4	D	2	2	1.30E-01	1.50E-01						6.7E+03	2.2E-05	2.5E+03	6.0E-05					2.9E+03	5.2E-05	9.0E+03	1.7E-05
PAOC12	INORG	Thallium	7440-28-0			2	2	1.70E-01	2.20E-01							3.5E+01	6.3E-03							1.3E+02	1.7E-03
PAOC12	INORG	Vanadium	7440-62-2			2	2	1.79E+01	2.00E+01							7.5E+02	2.7E-02							5.5E+03	3.6E-03
PAOC12	INORG	Zinc	7440-66-6	ID	2	2	7.90E+01	1.22E+02								1.7E+05	7.2E-04							6.3E+05	1.9E-04
PAOC13	VOC	Bromodichloromethane	75-27-4	B2	26	1	2.00E-02	2.00E-02		1.2E+00	1.7E-02	9.1E+00	2.2E-03	8.4E+04	2.4E-07	1.1E+02	1.8E-04	6.4E+00	3.1E-03	3.1E+01	6.5E-04	1.1E+05	1.8E-07	4.9E+02	4.1E-05
PAOC13	VOC	Chloroform	67-66-3	B2	26	2	1.50E-02	1.10E-01		7.2E+00	1.5E-02	4.5E+01	2.4E-03	1.3E+06	8.5E-08	1.2E+03	9.2E-05	3.8E+01	2.9E-03	1.5E+02	7.3E-04	1.6E+06	6.9E-08	1.5E+03	7.3E-05
PAOC13	VOC	Ethyl Benzene	100-41-4	D	26	4	2.90E-02	4.00E+01		8.7E+01	4.6E-01	7.2E+02	5.6E-02	1.0E+07	4.0E-06	1.4E+02	2.9E-01	1.4E+02	2.9E-01	2.4E+03	1.7E-02	1.3E+07	3.1E-06	1.4E+02	2.9E-01
PAOC13	VOC	Tetrachloroethene	127-18-4	C-B2	26	2	1.50E-02	2.60E-01		1.1E+01	2.4E-02	1.8E+02	1.4E-03	5.4E+06	4.8E-08	8.8E+01	3.0E-03	6.0E+01	4.3E-03	6.0E+02	4.3E-04	6.8E+06	3.8E-08	8.8E+01	3.0E-03
PAOC13	VOC	Toluene	108-88-3	ID	26	2	1.30E-02	2.40E+00		2.5E+02	9.6E-03	2.8E+03	8.6E-04	2.7E+07	8.9E-08	2.5E+02	9.6E-03	2.5E+02	9.6E-03	3.3E+03	7.3E-04	1.2E+07	2.0E-07	2.5E+02	9.6E-03
PAOC13	VOC	1,1,1-Trichloroethane	71-55-6	ID	26	3	1.30E-02	5.60E-02		2.5E+02	2.2E-04	3.8E+03	1.5E-05	6.7E+07	8.4E-10	4.6E+02	1.2E-04	4.6E+02	1.2E-04	4.5E+03	1.2E-05	2.9E+07	1.9E-09	4.6E+02	1.2E-04
PAOC13	VOC	Trichloroethene	79-01-6	C-B2	26	1	2.70E-01	2.70E-01		7.1E+00	3.8E-02	7.8E+01	3.5E-03	1.8E+06	1.5E-07	5.0E+02	5.4E-04	3.7E+01	7.3E-03	2.6E+02	1.0E-03	2.3E+06	1.2E-07	5.0E+02	5.4E-04
PAOC13	VOC	Xylenes (total)	1330-20-7	ID	26	3	2.30E-01	2.00E+01		1.5E+02	1.3E-01	4.6E+04	4.3E-04	2.9E+08	6.9E-08	1.5E+02	1.3E-01	1.5E+02	1.3E-01	5.4E+04	3.7E-04	1.3E+08	1.5E-07	1.5E+02	1.3E-01
PAOC13	INORG	Chromium (total)	7440-47-3		14	14	1.29E-02	3.28E+01						2.6E+02	1.3E-01	2.5E+03	1.3E-02					2.4E+02	1.4E-01	9.2E+03	3.6E-03
PAOC13	INORG	Lead	7439-92-1	B2	14	14	1.23E-02	3.00E+01						1.0E+05	3.0E-04	4.0E+02	7.5E-02					4.4E+04	6.8E-04	9.0E+02	3.3E-02
PAOC13/PAOC19	VOC	2-Butanone	78-93-3	ID	2	2	1.60E-03	1.90E-02		2.7E+04	7.0E-07	2.9E+04	6.6E-07	6.7E+07	2.8E-10	2.7E+04	7.0E-07	2.7E+04	7.0E-07	3.5E+04	5.4E-07	2.9E+07	6.6E-10	2.7E+04	7.0E-07
PAOC13/PAOC19	VOC	Carbon Disulfide	75-15-0		2	2	4.60E-04	5.50E-04		7.6E+01	7.2E-06	1.3E+03	4.2E-07	4.7E+07	1.2E-11	2.8E+02	2.0E-06	1.4E+02	3.9E-06	1.6E+03	3.4E-07	2.1E+07	2.6E-11	2.8E+02	2.0E-06
PAOC13/PAOC19	VOC	cis-1,2-Dichloroethene	156-59-2	ID	2	1	6.10E-04	6.10E-04		2.2E+01	2.8E-05	1.8E+02	3.4E-06	2.3E+06	2.7E-10	6.4E+02	9.5E-07	4.1E+01	1.5E-05	2.1E+02	2.9E-06	1.0E+06	6.1E-10	6.4E+02	9.5E-07
PAOC13/PAOC19	VOC	Trichloroethene	79-01-6	C-B2	2	1	6.70E-04	6.70E-04		7.1E+00	9.4E-05	7.8E+01	8.6E-06	1.8E+06	3.7E-10	5.0E+02	1.3E-06	3.7E+01	1.8E-05	2.6E+02	2.6E-06	2.3E+06	2.9E-10	5.0E+02	1.3E-06
PAOC13/PAOC19	SVOC	Anthracene	120-12-7	D	2	1	6.10E-03	6.10E-03		1.0E+06	6.1E-09	1.4E+06	4.4E-09	6.7E+07	9.1E-11	2.3E+05	2.7E-08	1.0E+06	6.1E-09	1.6E+06	3.8E-09	2.9E+07	2.1E-10	7.3E+05	8.4E-09
PAOC13/PAOC19	SVOC	Benzo(b)fluoranthene	205-99-2	B2	2	1	8.00E-03	8.00E-03								2.0E+01	4.0E-04							8.0E+01	1.0E-04
PAOC13/PAOC19	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	1	4.80E-02	4.80E-02						7.0E+05	6.9E-08	2.8E+03	1.7E-05					8.9E+05	5.4E-08	1.0E+04	4.8E-06
PAOC13/PAOC19	SVOC	Phenanthrene	85-01-8	D	2	1	8.80E-03	8.80E-03		2.8E+03	3.1E-06	1.6E+02	5.5E-05	6.7E+03	1.3E-06	1.6E+03	5.5E-06	5.1E+03	1.7E-06	1.9E+02	4.6E-05	2.9E+03	3.0E-06	5.2E+03	1.7E-06
PAOC13/PAOC19	INORG	Antimony	7440-36-0		2	1	5.20E-02	5.20E-02						1.3E+04	4.0E-06	1.8E+02	2.9E-04					5.9E+03	8.8E-06	6.7E+02	7.8E-05
PAOC13/PAOC19	INORG	Arsenic	7440-38-2	A	2	2	1.70E+00	3.80E+00						7.2E+02	5.3E-03	7.6E+00	5.0E-01					9.1E+02	4.2E-03	3.7E+01	1.0E-01
PAOC13/PAOC19	INORG	Barium	7440-39-3	NC	2	2	1.14E+01	4.51E+01						3.3E+05	1.4E-04	3.7E+04	1.2E-03					1.5E+05	3.0E-04	1.3E+05	3.5E-04
PAOC13/PAOC19	INORG	Beryllium	7440-41-7	B1	2	2	1.70E-01	3.60E-01						1.3E+03	2.8E-04	4.1E+02	8.8E-04					5.9E+02	6.1E-04	1.6E+03	2.3E-04
PAOC13/PAOC19	INORG	Cadmium	7440-43-9	B1	2	2	1.70E-01	3.40E-01						1.7E+03	2.0E-04	5.5E+02	6.2E-04					2.2E+03	1.5E-04	2.1E+03	1.6E-04
PAOC13/PAOC19	INORG	Chromium III	16065-83-1	D	2	2	5.36E+00	1.02E+01						3.3E+05	3.1E-05	7.9E+05	1.3E-05					1.5E+05	6.8E-05	1.0E+06	1.0E-05
PAOC13/PAOC19	INORG	Chromium VI	18540-29-9	A	2	2	6.40E-01	1.30E+00						2.6E+02	5.0E-03	2.5E+03	5.2E-04					2.4E+02	5.4E-03	9.2E+03	1.4E-04
PAOC13/PAOC19	INORG	Cobalt	7440-48-4	LC	2	2	3.10E+00	4.50E+00						1.3E+04	3.5E-04	2.6E+03	1.7E-03					5.9E+03	7.6E-04	9.0E+03	5.0E-04
PAOC13/PAOC19	INORG	Copper	7440-50-8	D	2	2	7.20E+00	8.00E+00						1.3E+05	6.2E-05	2.0E+04	4.0E-04					5.9E+04	1.4E-04	7.3E+04	1.1E-04
PAOC13/PAOC19	INORG	Lead	7439-92-1	B2	2	2	3.80E+00	8.70E+00						1.0E+05	8.7E-05	4.0E+02	2.2E-02					4.4E+04	2.0E-04	9.0E+02	9.7E-03
PAOC13/PAOC19	INORG	Manganese	7439-96-5	D	2	2	1.30E+02	2.25E+02	4.40E+02					3.3E+03		2.5E+04						1.5E+03		9.0E+04	
PAOC13/PAOC19	INORG	Mercury	7439-97-6	D	2	1	2.30E-02	2.30E-02		4.8E+01	4.8E-04	5.2E+01	4.4E-04	2.0E+04	1.2E-06	1.6E+02	1.4E-04	8.9E+01	2.6E-04	6.2E+01	3.7E-04	8.8E+03	2.6E-06	5.8E+02	4.0E-05
PAOC13/PAOC19	INORG	Nickel	7440-02-0	A	2	2	6.90E+00	8.80E+00						1.3E+04	6.8E-04	4.0E+04	2.2E-04					1.6E+04	5.5E-04	1.5E+05	5.9E-05
PAOC13/PAOC19	INORG	Selenium	7782-49-2	D	2	1	8.50E-01	8.50E-01						1.3E+05	6.5E-06	2.6E+03	3.3E-04					5.9E+04	1.4E-05	9.6E+03	8.9E-05
PAOC13/PAOC19	INORG	Silver	7440-22-4	D	2	2	3.20E-02	4.20E-02						6.7E+03	6.3E-06	2.5E+03	1.7E-05					2.9E+03	1.4E-05	9.0E+03	4.7E-06
PAOC13/PAOC19	INORG	Thallium	7440-28-0			2	1	8.20E-02	8.20E-02							3.5E+01	2.3E-03							1.3E+02	6.3E-04
PAOC13/PAOC19	INORG	Vanadium	7440-62-2			2	2	1.15E+01	1.52E+01							7.5E+02	2.0E-02							5.5E+03	2.8E-03
PAOC13/PAOC19	INORG	Zinc	7440-66-6	ID	2	2	2.43E+01	3.28E+01								1.7E+05	1.9E-04							6.3E+05	5.2E-05
PAOC14	SVOC	Benzo(a)anthracene	56-55-3	B2	13	1	9.40E-03	9.40E-03								2.0E+01	4.7E-04							8.0E+01	1.2E-04
PAOC14	SVOC	Benzo(b)fluoranthene	205-99-2	B2	1	1	1.00E-02	1.00E-02								2.0E+01	5.0E-04							8.0E+01	1.3E-04
PAOC14	SVOC	Chrysene	218-01-9	B2	13	1	9.30E-03	9.30E-03								2.0E+03									

Table 1b: Exceedance Summary for Soil Pontiac Validation Center, Pontiac, Michigan																								
Area	Location	Top Depth (ft)	Bottom Depth (ft)	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Conc to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Conc to Res VSIC	Residential PSIC (mg/kg)	Ratio of Conc to Res PSIC	Residential DCC (mg/kg)	Ratio of Conc to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Conc to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Conc to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Conc to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Conc to Industrial II DCC
Background	BG-06	7	9	03/07/08	INORG	Manganese	7439-96-5	4.11E+03					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
PAOC02	BH-70-08	4	6	03/05/08	VOC	Trichloroethene	79-01-6	8.20E-02	7.1E+00	1.2E-02	7.8E+01	1.1E-03	1.8E+06	4.6E-08	5.0E+02	1.6E-04	3.7E+01	2.2E-03	2.6E+02	3.2E-04	2.3E+06	3.6E-08	5.0E+02	1.6E-04
PAOC02	BH-87-08	7	9	03/06/08	VOC	Trichloroethene	79-01-6	1.40E-01	7.1E+00	2.0E-02	7.8E+01	1.8E-03	1.8E+06	7.8E-08	5.0E+02	2.8E-04	3.7E+01	3.8E-03	2.6E+02	5.4E-04	2.3E+06	6.1E-08	5.0E+02	2.8E-04
PAOC02	BH-PS-7	2	2	04/25/95	INORG	Arsenic	7440-38-2	1.20E+01					7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.2E-01
PAOC02	MW-69-08	18	20	03/12/08	VOC	Tetrachloroethene	127-18-4	7.40E-02	1.1E+01	6.7E-03	1.8E+02	4.1E-04	5.4E+06	1.4E-08	8.8E+01	8.4E-04	6.0E+01	1.2E-03	6.0E+02	1.2E-04	6.8E+06	1.1E-08	8.8E+01	8.4E-04
PAOC02	MW-74-08	0	2	03/14/08	VOC	1,1-Dichloroethene	75-35-4	1.10E-01	6.2E-02	1.8E+00	1.1E+00	1.0E-01	6.2E+04	1.8E-06	2.0E+02	5.5E-04	3.3E-01	3.3E-01	3.7E+00	3.0E-02	7.8E+04	1.4E-06	5.7E+02	1.9E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	1,1-Dichloroethene	75-35-4	2.60E-01	6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	Trichloroethene	79-01-6	7.60E+00	7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02
PAOC04	BH-92-08	7.5	9.5	03/14/08	INORG	Arsenic	7440-38-2	1.21E+01					7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.3E-01
PAOC05	A	14	15	01/18/90	VOC	Benzene	71-43-2	5.20E+00	1.6E+00	3.3E+00	1.3E+01	4.0E-01	3.8E+05	1.4E-05	1.8E+02	2.9E-02	8.4E+00	6.2E-01	4.5E+01	1.2E-01	4.7E+05	1.1E-05	4.0E+02	1.3E-02
PAOC05	BH-36-07	0	2	12/03/07	SVOC	Benzo(a)pyrene	50-32-8	2.60E+00					1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC05	C	14	15	01/18/90	VOC	Benzene	71-43-2	3.10E+00	1.6E+00	1.9E+00	1.3E+01	2.4E-01	3.8E+05	8.2E-06	1.8E+02	1.7E-02	8.4E+00	3.7E-01	4.5E+01	6.9E-02	4.7E+05	1.6E-06	4.0E+02	7.8E-03
PAOC05	F	14	15	01/18/90	VOC	Benzene	71-43-2	8.00E-02	1.6E+00	5.0E-02	1.3E+01	6.2E-03	3.8E+05	2.1E-07	1.8E+02	4.4E-04	8.4E+00	9.5E-03	4.5E+01	1.8E-03	4.7E+05	1.7E-07	4.0E+02	2.0E-04
PAOC05	SB16P3_E_SIDEWALL	5	5	07/06/95	VOC	Benzene	71-43-2	1.50E+00	1.6E+00		9.4E-01	1.3E+01	3.8E+05	3.9E-06	1.8E+02	8.3E-03	8.4E+00	1.8E-01	4.5E+01	3.3E-02	4.7E+05	3.2E-06	4.0E+02	3.8E-03
PAOC05	SB16P3_N_SIDEWALL	4	4	06/30/95	VOC	Benzene	71-43-2	7.70E-02	1.6E+00	4.8E-02	1.3E+01	5.9E-03	3.8E+05	2.0E-07	1.8E+02	4.3E-04	8.4E+00	9.2E-03	4.5E+01	1.7E-03	4.7E+05	1.6E-07	4.0E+02	1.9E-04
PAOC05	SB16P3_N_SIDEWALL~1	5	5	06/30/95	VOC	Toluene	108-88-3	1.40E+01	2.5E+02	5.6E-02	2.8E+03	5.0E-03	2.7E+07	5.2E-07	2.5E+02	5.6E-02	2.5E+02	5.6E-02	3.3E+03	4.2E-03	1.2E+07	1.2E-06	2.5E+02	5.6E-02
PAOC05	SB16P3_N_SIDEWALL~1	5	5	06/30/95	VOC	Xylenes (total)	1330-20-7	6.30E+01	1.5E+02	4.2E-01	4.6E+04	1.4E-03	2.9E+08	2.2E-07	1.5E+02	4.2E-01	1.5E+02	4.2E-01	5.4E+04	1.2E-03	1.3E+08	4.8E-07	1.5E+02	4.2E-01
PAOC05	SB16P3_N_SIDEWALL~2	5	5	07/06/95	VOC	Toluene	108-88-3	2.00E+01	2.5E+02	8.0E-02	2.8E+03	7.1E-03	2.7E+07	7.4E-07	2.5E+02	8.0E-02	2.5E+02	8.0E-02	3.3E+03	6.1E-03	1.2E+07	1.7E-06	2.5E+02	8.0E-02
PAOC05	SB16P3_N_SIDEWALL~2	5	5	07/06/95	VOC	Xylenes (total)	1330-20-7	6.00E+01	1.5E+02	4.0E-01	4.6E+04	1.3E-03	2.9E+08	2.1E-07	1.5E+02	4.0E-01	1.5E+02	4.0E-01	5.4E+04	1.1E-03	1.3E+08	4.6E-07	1.5E+02	4.0E-01
PAOC05	SB16P3_NC_FLOOR	11	11	06/30/95	VOC	Benzene	71-43-2	7.40E-01	1.6E+00	4.6E-01	1.3E+01	5.7E-02	3.8E+05	1.9E-06	1.8E+02	4.1E-03	8.4E+00	8.8E-02	4.5E+01	1.6E-02	4.7E+05	1.6E-06	4.0E+02	1.9E-03
PAOC05	SB16P3_NE_FLOOR	11	11	06/30/95	VOC	Benzene	71-43-2	3.40E+00	1.6E+00	2.1E+00	1.3E+01	2.6E-01	3.8E+05	8.9E-06	1.8E+02	1.9E-02	8.4E+00	4.0E-01	4.5E+01	7.6E-02	4.7E+05	7.2E-06	4.0E+02	8.5E-03
PAOC05	SB16P3_NE_FLOOR~2	11	11	07/05/95	VOC	Benzene	71-43-2	5.00E+00	1.6E+00	3.1E+00	1.3E+01	3.8E-01	3.8E+05	1.3E-05	1.8E+02	2.8E-02	8.4E+00	6.0E-01	4.5E+01	1.1E-01	4.7E+05	1.1E-05	4.0E+02	1.3E-02
PAOC05	SB16P3_NW_FLOOR~1	9	9	06/30/95	VOC	Benzene	71-43-2	9.20E-02	1.6E+00	5.8E-02	1.3E+01	7.1E-03	3.8E+05	2.4E-07	1.8E+02	5.1E-04	8.4E+00	1.1E-02	4.5E+01	2.0E-03	4.7E+05	2.0E-07	4.0E+02	2.3E-04
PAOC05	SB16P3_SE_FLOOR	13	13	06/28/95	VOC	Benzene	71-43-2	6.30E-01	1.6E+00	3.9E-01	1.3E+01	4.8E-02	3.8E+05	1.7E-06	1.8E+02	3.5E-03	8.4E+00	7.5E-02	4.5E+01	1.4E-02	4.7E+05	1.3E-06	4.0E+02	1.6E-03
PAOC05	SB16P3_SFLOOR	8	8	06/28/95	VOC	Benzene	71-43-2	3.50E-01	1.6E+00	2.2E-01	1.3E+01	2.7E-02	3.8E+05	9.2E-07	1.8E+02	1.9E-03	8.4E+00	4.2E-02	4.5E+01	7.8E-03	4.7E+05	7.4E-07	4.0E+02	8.8E-04
PAOC05	SB-N-1	18	20	12/22/93	VOC	Benzene	71-43-2	1.27E+00	1.6E+00	7.9E-01	1.3E+01	9.8E-02	3.8E+05	3.3E-06	1.8E+02	7.1E-03	8.4E+00	1.5E-01	4.5E+01	2.8E-02	4.7E+05	2.7E-06	4.0E+02	3.2E-03
PAOC05	TANK 2	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	1.25E+02	8.7E+01	1.4E+00	7.2E+02	1.7E-01	1.0E+07	1.3E-05	1.4E+02	8.9E-01	1.4E+02	8.9E-01	2.4E+03	5.2E-02	1.3E+07	9.6E-06	1.4E+02	8.9E-01
PAOC05	TANK 2	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	4.50E+02	1.5E+02	3.0E+00	4.6E+04	9.8E-03	2.9E+08	1.6E-06	1.5E+02	3.0E+00	1.5E+02	3.0E+00	5.4E+04	8.3E-03	1.3E+08	3.5E-06	1.5E+02	3.0E+00
PAOC05	TANK 3	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	3.00E+01	8.7E+01	3.4E-01	7.2E+02	4.2E-02	1.0E+07	3.0E-06	1.4E+02	2.1E-01	1.4E+02	2.1E-01	2.4E+03	1.3E-02	1.3E+07	2.3E-06	1.4E+02	2.1E-01
PAOC05	TANK 3	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	1.25E+02	1.5E+02	8.3E-01	4.6E+04	2.7E-03	2.9E+08	4.3E-07	1.5E+02	8.3E-01	1.5E+02	8.3E-01	5.4E+04	2.3E-03	1.3E+08	9.6E-07	1.5E+02	8.3E-01
PAOC05	TANK 5	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	4.00E+01	1.5E+02	2.7E-01	4.6E+04	8.7E-04	2.9E+08	1.4E-07	1.5E+02	2.7E-01	1.5E+02	2.7E-01	5.4E+04	7.4E-04	1.3E+08	3.1E-07	1.5E+02	2.7E-01
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Ethyl Benzene	100-41-4	3.50E+03	8.7E+01	4.0E+01	7.2E+02	4.9E+00	1.0E+07	3.5E-04	1.4E+02	2.5E+01	1.4E+02	2.5E+01	2.4E+03	1.5E+00	1.3E+07	2.7E-04	1.4E+02	2.5E+01
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Toluene	108-88-3	8.50E+02	2.5E+02	3.4E+00	2.8E+03	3.0E-01	2.7E+07	3.1E-05	2.5E+02	3.4E+00	2.5E+02	3.4E+00	3.3E+03	2.6E-01	1.2E+07	7.1E-05	2.5E+02	3.4E+00
PAOC05	TANK 6	NA	NA	01/17/89	VOC	Xylenes (total)	1330-20-7	2.30E+04	1.5E+02	1.5E+02	4.6E+04	5.0E-01	2.9E+08	7.9E-05	1.5E+02	1.5E+02	1.5E+02	1.5E+02	5.4E+04	4.3E-01	1.3E+08	1.8E-04	1.5E+02	1.5E+02
PAOC05	WB16P3_SIDEWALL~12	5	5	08/11/95	VOC	Benzene	71-43-2	2.90E+00	1.6E+00	1.8E+00	1.3E+01	2.2E-01	3.8E+05	7.6E-06	1.8E+02	1.6E-02	8.4E+00	3.5E-01	4.5E+01	6.4E-02	4.7E+05	6.2E-06	4.0E+02	7.3E-03
PAOC05	WB16P3_SIDEWALL~9	5	5	08/08/95	VOC	Benzene	71-43-2	2.30E+00	1.6E+00	1.4E+00	1.3E+01	1.8E-01	3.8E+05	6.1E-06	1.8E+02	1.3E-02	8.4E+00	2.7E-01	4.5E+01	5.1E-02	4.7E+05	4.9E-06	4.0E+02	5.8E-03
PAOC06	BH-47-07	17.5	20	10/09/07	INORG	Arsenic	7440-38-2	1.11E+01					7.2E+02	1.5E-02	7.6E+00	1.5E+00					9.1E+02	1.2E-02	3.7E+01	3.0E-01
PAOC06	BH-80-08	4	6	03/05/08	SVOC	2,6-Dinitrotoluene	606-20-2	1.50E-01																
PAOC09	BH-77-08	8	10	03/11/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.30E-01	2.2E+01	3.3E-02	1.8E+02	4.1E-03	2.3E+06	3.2E-07	6.4E+02	1.1E-03	4.1E+01	1.8E-02	2.1E+02	3.5E-03	1.0E+06	7.3E-07	6.4E+02	1.1E-03
PAOC09	BH-77-08	8	10	03/11/08	VOC	Trichloroethene	79-01-6	2.20E-01	7.1E+00	3.1E-02	7.8E+01	2.8E-03	1.8E+06	1.2E-07	5.0E+02	4.4E-04	3.7E+01	5.9E-03	2.6E+02	8.5E-04	2.3E+06	9.6E-08	5.0E+02	4.4E-04
PAOC09	BH-77-08	8	10	03/11/08	VOC	Trichloroethene	79-01-6	1.20E-01	7.1E+00	1.7E-02	7.8E+01	1.5E-03	1.8E+06	6.7E-08	5.0E+02	2.4E-04	3.7E+01	3.2E-03	2.6E+02	4.6E-04	2.3E+06	5.2E-08	5.0E+02	2.4E-04
PAOC09	BH-77-08	8	10	03/11/08	VOC	Vinyl Chloride	75-01-4	6.60E-02	2.7E-01	2.4E-01	4.2E+00	1.6E-02	3.5E+05	1.9E-07	3.8E+00	1.7E-02	2.8E+00	2.4E-02	2.9E+01	2.3E-03	8.9E+05	7.4E-08	3.4E+01	1.9E-03
PAOC09	BH-77-08	8	10	03/11/08	VOC	Vinyl Chloride	75-01-4	4.50E-02	2.7E-01	1.7E-01	4.2E+00	1.1E-02	3.5E+05	1.3E-07	3.8E+00	1.2E-02	2.8E+00	1.6E-02	2.9E+01	1.6E-03	8.9E+05	5.1E-08	3.4E+01	1.3E-03
PAOC11	BH-14-07	0	2	10/16/07	INORG	Antimony																		

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	VOC	2-Butanone	78-93-3	ID	5	1	2.50E-03	2.50E-03	1.3E+01	1.9E-04	3.8E+01	6.6E-05	2.4E+05	1.0E-08	2.4E+05	1.0E-08	2.4E+05	1.0E-08
PAOC01	VOC	1,3-Dichlorobenzene	541-73-1	D	5	3	1.80E-04	2.90E-04	6.6E-03	4.4E-02	1.9E-02	1.5E-02					2.0E+00	1.5E-04
PAOC01	VOC	1,4-Dichlorobenzene	106-46-7	C	5	2	3.00E-04	4.80E-04	7.5E-02	6.4E-03	7.5E-02	6.4E-03	1.6E+01	3.0E-05	7.4E+01	6.5E-06	6.4E+00	7.5E-05
PAOC01	VOC	cis-1,2-Dichloroethene	156-59-2	ID	5	1	8.80E-03	8.80E-03	7.0E-02	1.3E-01	7.0E-02	1.3E-01	9.3E+01	9.5E-05	2.1E+02	4.2E-05	2.0E+02	4.4E-05
PAOC01	VOC	trans-1,2-Dichloroethene	156-60-5		5	1	2.90E-03	2.90E-03	1.0E-01	2.9E-02	1.0E-01	2.9E-02	8.5E+01	3.4E-05	2.0E+02	1.5E-05	2.2E+02	1.3E-05
PAOC01	VOC	4-Methyl-2-pentanone	108-10-1	ID	5	1	3.20E-03	3.20E-03	1.8E+00	1.8E-03	5.2E+00	6.2E-04	2.0E+04	1.6E-07	2.0E+04	1.6E-07	1.3E+04	2.5E-07
PAOC01	VOC	Trichloroethene	79-01-6	C-B2	5	1	5.10E-02	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	PCB	PCBs (total)	1336-36-3	B2	5	1	6.20E-04	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	INORG	Aluminum	7429-90-5	ID	5	4	1.16E-02	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	INORG	Barium	7440-39-3	NC	5	5	1.20E-02	3.94E-01	2.0E+00	2.0E-01	2.0E+00	2.0E-01					1.4E+04	2.8E-05
PAOC01	INORG	Cadmium	7440-43-9	B1	5	1	7.10E-04	7.10E-04	5.0E-03	1.4E-01	5.0E-03	1.4E-01					1.9E+02	3.7E-06
PAOC01	INORG	Chromium III	16065-83-1	D	5	5	2.50E-03	2.60E-03	3.8E+01	6.8E-05	1.1E+02	2.4E-05					2.9E+05	9.0E-09
PAOC01	INORG	Cobalt	7440-48-4	LC	5	2	2.10E-03	2.50E-03	4.0E-02	6.3E-02	1.0E-01	2.5E-02					2.4E+03	1.0E-06
PAOC01	INORG	Iron	7439-89-6	D	5	5	8.71E-02	1.81E+00	2.0E+00	9.1E-01	5.6E+00	3.2E-01					5.8E+04	3.1E-05
PAOC01	INORG	Manganese	7439-96-5	D	5	5	1.45E-02	2.15E+00	8.6E-01	2.5E+00	8.6E-01						9.1E+03	2.4E-04
PAOC01	INORG	Nickel	7440-02-0	A	5	3	3.50E-03	6.70E-03	1.0E-01	6.7E-02	1.0E-01	6.7E-02					7.4E+04	9.1E-08
PAOC01	INORG	Vanadium	7440-62-2		5	1	3.20E-03	3.20E-03	4.5E-03	7.1E-01	6.2E-02	5.2E-02					9.7E+02	3.3E-06
PAOC01	INORG	Zinc	7440-66-6	ID	5	4	5.80E-03	1.05E-02	2.4E+00	4.4E-03	5.0E+00	2.1E-03					1.1E+05	9.5E-08
PAOC02	VOC	Acetone	67-64-1	ID	9	1	1.80E-01	1.80E-01	7.3E-01	2.5E-01	2.1E+00	8.6E-02	1.0E+06	1.8E-07	1.0E+06	1.8E-07	3.1E+04	5.8E-06
PAOC02	VOC	2-Butanone	78-93-3	ID	9	2	7.40E-04	3.60E-02	1.3E+01	2.8E-03	3.8E+01	9.5E-04	2.4E+05	1.5E-07	2.4E+05	1.5E-07	2.4E+05	1.5E-07
PAOC02	VOC	Chloroform	67-66-3	B2	9	2	2.30E-04	1.70E-02	8.0E-02	2.1E-01	8.0E-02	2.1E-01	2.8E+01	6.1E-04	1.8E+02	9.4E-05	1.5E+02	1.1E-04
PAOC02	VOC	1,1-Dichloroethane	75-34-3	SC	9	1	2.30E-01	2.30E-01	8.8E-01	2.6E-01	2.5E+00	9.2E-02	1.0E+03	2.3E-04	2.3E+03	1.0E-04	2.4E+03	9.6E-05
PAOC02	VOC	1,1-Dichloroethene	75-35-4	C	9	4	4.70E-04	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	VOC	cis-1,2-Dichloroethene	156-59-2	ID	9	1	7.60E-02	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	VOC	2-Hexanone	591-78-6		9	1	3.80E-03	3.80E-03	1.0E+00	3.8E-03	2.9E+00	1.3E-03	4.2E+03	9.0E-07	8.7E+03	4.4E-07	5.2E+03	7.3E-07
PAOC02	VOC	4-Methyl-2-pentanone	108-10-1	ID	9	2	7.90E-04	7.60E-03	1.8E+00	4.2E-03	5.2E+00	1.5E-03	2.0E+04	3.8E-07	2.0E+04	3.8E-07	1.3E+04	5.8E-07
PAOC02	VOC	Toluene	108-88-3	ID	9	1	2.40E-04	2.40E-04	1.0E+00	2.4E-04	1.0E+00	2.4E-04	5.3E+02	4.5E-07	5.3E+02	4.5E-07	5.3E+02	4.5E-07
PAOC02	VOC	1,1,1-Trichloroethane	71-55-6	ID	9	1	1.00E+00	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	VOC	Trichloroethene	79-01-6	C-B2	9	1	2.10E+00	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	VOC	Trichlorofluoromethane	75-69-4		9	1	2.20E-04	2.20E-04	2.6E+00	8.5E-05	7.3E+00	3.0E-05	1.1E+03	2.0E-07	1.1E+03	2.0E-07	1.1E+03	2.0E-07
PAOC02	SVOC	Acenaphthene	83-32-9		8	1	6.60E-04	6.60E-04	1.3E+00	5.1E-04	3.8E+00	1.7E-04	4.2E+00	1.6E-04	4.2E+00	1.6E-04	4.2E+00	1.6E-04
PAOC02	SVOC	Anthracene	120-12-7	D	8	1	1.30E-03	1.30E-03	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02	4.3E-02	3.0E-02
PAOC02	SVOC	Benzo(a)anthracene	56-55-3	B2	8	2	3.50E-04	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	SVOC	Benzo(a)pyrene	50-32-8	B2	8	2	3.00E-04	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	SVOC	Benzo(b)fluoranthene	205-99-2	B2	8	2	3.50E-04	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	SVOC	Benzo(g,h,i)perylene	191-24-2	D	8	1	2.20E-03	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	SVOC	Benzo(k)fluoranthene	207-08-9	B2	8	1	1.70E-03	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	8	3	9.00E-04	9.70E-04	6.0E-03	1.6E-01	6.0E-03	1.6E-01					3.2E-01	3.0E-03
PAOC02	SVOC	Carbazole	86-74-8	B2	8	1	9.70E-04	9.70E-04	8.5E-02	1.1E-02	3.5E-01	2.8E-03					7.4E+00	1.3E-04
PAOC02	SVOC	Chrysene	218-01-9	B2	8	2	3.20E-04	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	SVOC	Dibenz(a,h)anthracene	53-70-3	B2	8	1	6.10E-04	6.10E-04	2.0E-03	3.1E-01	2.0E-03	3.1E-01					2.0E-03	3.1E-01
PAOC02	SVOC	Di-n-butylphthalate	84-74-2	D	8	1	7.30E-04	7.30E-04	8.8E-01	8.3E-04	2.5E+00	2.9E-04					1.1E+01	6.6E-05
PAOC02	SVOC	Fluoranthene	206-44-0	D	8	3	2.40E-04	8.40E-03	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02	2.1E-01	4.0E-02
PAOC02	SVOC	Fluorene	86-73-7	D	8	1	7.20E-04	7.20E-04	8.8E-01	8.2E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04	2.0E+00	3.6E-04
PAOC02	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	8	1	2.00E-03	2.00E-03	2.0E-03	1.0E+00	2.0E-03	1.0E+00					2.0E-03	1.0E+00
PAOC02	SVOC	Phenanthrene	85-01-8	D	8	2	5.90E-04	5.80E-03	5.2E-02	1.1E-01	1.5E-01	3.9E-02	1.0E+00	5.8E-03	1.0E+00	5.8E-03	1.0E+00	5.8E-03
PAOC02	SVOC	Pyrene	129-00-0	NC	8	2	5.90E-04	6.30E-03	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02	1.4E-01	4.5E-02
PAOC02	INORG	Aluminum	7429-90-5	ID	8	8	2.25E-02	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	INORG	Antimony	7440-36-0		8	6	1.70E-04	1.70E-03	6.0E-03	2.8E-01	6.0E-03	2.8E-01					6.8E+01	2.5E-05
PAOC02	INORG	Barium	7440-39-3	NC	8	8	8.10E-03	2.99E-01	2.0E+00	1.5E-01	2.0E+00	1.5E-01					1.4E+04	2.1E-05
PAOC02	INORG	Chromium III	16065-83-1	D	8	4	1.40E-03	5.10E-03	3.8E+01	1.3E-04	1.1E+02	4.6E-05					2.9E+05	1.8E-08
PAOC02	INORG	Cobalt	7440-48-4	LC	8	1	1.33E-02	1.33E-02	4.0E-02	3.3E-01	1.0E-01	1.3E-01					2.4E+03	5.5E-06
PAOC02	INORG	Copper	7440-50-8	D	8	1	4.10E-03	4.10E-03	1.4E+00	2.9E-03	4.0E+00	1.0E-03					7.4E+03	5.5E-07
PAOC02	INORG	Cyanide (amenable)	57-12-5A		8	2	1.40E-02	2.00E-02										
PAOC02	INORG	Iron	7439-89-6	D	8	8	1.66E-01	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	INORG	Lead	7439-92-1	B2	8	2	2.50E-03	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC02	INORG	Manganese	7439-96-5	D	8	8	1.08E-02	5.95E-01	8.6E-01	6.9E-01	2.5E+00	2.4E-01					9.1E+03	6.5E-05
PAOC02	INORG	Mercury	7439-97-6	D	8	2	1.20E-04	1.20E-04	2.0E-03	6.0E-02	2.0E-03	6.0E-02	5.6E-02	2.1E-03	5.6E-02	2.1E-03	5.6E-02	2.1E-03
PAOC02	INORG	Nickel	7440-02-0	A	8	1	8.60E-03	8.60E-03	1.0E-01	8.6E-02	1.0E-01	8.6E-02					7.4E+04	1.2E-07
PAOC02	INORG	Selenium	7782-49-2	D	8	2	4.50E-03	5.40E-03	5.0E-02	1.1E-01	5.0E-02	1.1E-01					9.7E+02	5.6E-06
PAOC02	INORG	Vanadium	7440-62-2		8	3	1.00E-03	3.30E-03	4.5E-03	7.3E-01	6.2E-02	5.3E-02					9.7E+02	3.4E-06
PAOC02	INORG	Zinc	7440-66-6	ID	8	2	7.20E-03	3.14E-02	2.4E+00	1.3E-02	5.0E+00	6.3E-03					1.1E+05	2.9E-07
PAOC03	VOC	Toluene	108-88-3	ID	3	1	5.40E-04	5.40E-04	1.0E+00	5.4E-04	1.0E+00	5.4E-04	5.3E+02	1.0E-06	5.3E+02	1.0E-06	5.3E+02	1.0E-06
PAOC03	PCB	PCBs (total)	1336-36-3	B2	2	1	1.05E-04	1.05E-04	5.0E-04	2.1E-01	5.0E-04	2.1E-01	4.5E-02	2.3E-03	4.5E-02	2.3E-03	3.3E-03	3.2E-02
PAOC03	INORG	Aluminum	7429-90-5	ID	3	3	1.48E-01	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	INORG	Antimony	7440-36-0		3	3	1.40E-04	1.30E-03	6.0E-03	2.2E-01	6.0E-03	2.2E-01					6.8E+01	1.9E-05
PAOC03	INORG	Arsenic	7440-38-2	A	3	1	5.90E-03	5.90E-03	1.0E-02	5.9E-01	1.0E-02	5.9E-01					4.3E+00	1.4E-03
PAOC03	INORG	Barium	7440-39-3	NC	3	3	9.70E-03	1.19E-01	2.0E+00	6.0E-02	2.0E+00	6.0E-02					1.4E+04	8.5E-06
PAOC03	INORG	Chromium III	16065-83-1	D	2	2	5.00E-04	5.00E-04	3.8E+01	1.3E-05	1.1E+02	4.5E-06					2.9E+05	1.7E-09
PAOC03	INORG	Chromium VI	18540-29-9	A	2	2	6.00E-03	1.00E-02	1.0E-01	1.0E-01	1.0E-01	1.0E-01					4.6E+02	2.2E-05
PAOC03	INORG	Copper	7440-50-8	D	3	3	3.90E-03	6.30E-03	1.4E+00	4.5E-03	4.0E+00	1.6E-03					7.4E+03	8.5E-07
PAOC03	INORG	Iron	7439-89-6	D	3	3	3.46E-01	1.03E+00	2.0E+00	5.2E-01	5.6E+00	1.8E-01					5.8E+04	1.8E-05
PAOC03	INORG	Lead	7439-92-1	B2	3	1	5.60E-03	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	INORG	Manganese	7439-96-5	D	3	3	1.51E-02	2.54E-01	8.6E-01	3.0E-01	2.5E+00	1.0E-01					9.1E+03	2.8E-05
PAOC03	INORG	Nickel	7440-02-0	A	3	1	9.40E-03	9.40E-03	1.0E-01	9.4E-02	1.0E-01	9.4E-02					7.4E+04	1.3E-07
PAOC03	INORG	Vanadium	7440-62-2		3	2	3.30E-03	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC03	INORG	Zinc	7440-66-6	ID	3	2	1.62E-02	2.15E-02	2.4E+00	9.0E-03	5.0E+00	4.3E-03					1.1E+05	2.0E-07
PAOC05	VOC	Benzene	71-43-2	A	25	13	5.00E-04	1.40E+01	5.0E-03	2.8E+03	5.0E-03	2.8E+03	5.6E+00	2.5E+00	3.5E+01	4.0E-01	1.1E+01	1.3E+00
PAOC05	VOC	2-Butanone	78-93-3	ID	5	2	2.70E-03	7.00E-03	1.3E+01	5.4E-04	3.8E+01	1.8E-04	2.4E+05	2.9E-08	2.4E+05	2.9E-08	2.4E+05	2.9E-08
PAOC05	VOC	Carbon Disulfide	75-15-0		5	1	3.60E-04	3.60E-04	8.0E-01	4.5E-04	2.3E+00	1.6E-04	2.5E+02	1.4E-06	5.5E+02	6.5E-07	1.2E+03	3.0E-07
PAOC05	VOC	Chloroethane	75-00-3	LC	9	1	5.90E-04	5.90E-04	4.3E-01	1.4E-03	1.7E+00	3.5E-04	5.7E+03	1.0E-07	5.7E+03	1.0E-07	4.4E+02	1.3E-06
PAOC05	VOC	1,1-Dichloroethane	75-34-3	SC	9	1	2.00E-03	2.00E-03	8.8E-01	2.3E-03	2.5E+00	8.0E-04	1.0E+03	2.0E-06	2.3E+03	8.7E-07	2.4E+03	8.3E-07
PAOC05	VOC	1,1-Dichloroethene	75-35-4	C	9	2	9.20E-04	1.20E-03	7.0E-03	1.7E-01	7.0E-03	1.7E-01	2.0E-01	6.0E-03	1.3E+00	9.2E-04	1.1E+01	1.1E-04
PAOC05	VOC	trans-1,2-Dichloroethene	156-60-5		9	2	1.40E-02	1.60E-02	1.0E-01	1.6E-01	1.0E-01	1.6E-01	8.5E+01	1.9E-04	2.0E+02	8.0E-05	2.2E+02	7.3E-05
PAOC05	VOC	Ethyl Benzene	100-41-4	D	25	9	4.50E-03	2.10E+00	7.0E-01	3.0E+00	7.0E-01	3.0E+00	1.1E+02	1.9E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	VOC	Methyl tert-butyl ether	1634-04-4		5	1	2.30E-04	2.30E-04	2.4E-01	9.6E-04	6.9E-01	3.3E-04	4.7E+04	4.9E-09	4.7E+04	4.9E-09	6.1E+02	3.8E-07
PAOC05	VOC	Tetrachloroethene	127-18-4	C-B2	9	1	1.30E-03	1.30E-03	5.0E-03	2.6E-01	5.0E-03	2.6E-01	2.5E+01	5.2E-05	1.7E+02	7.6E-06	1.2E+01	1.1E-04
PAOC05	VOC	Toluene	108-88-3	ID	25	10	1.80E-03	2.20E+01	1.0E+00	2.2E+01	1.0E+00	2.2E+01	5.3E+02	4.2E-02	5.3E+02	4.2E-02	5.3E+02	4.2E-02
PAOC05	VOC	1,1,1-Trichloroethane	71-55-6	ID	9	2	1.10E-03	3.60E-03	2.0E-01	1.8E-02	2.0E-01	1.8E-02	6.6E+02	5.5E-06	1.3E+03	2.8E-06	1.3E+03	2.8E-06
PAOC05	VOC	Trichloroethene	79-01-6	C-B2	9	1	2.40E-03	2.40E-03	5.0E-03	4.8E-01	5.0E-03	4.8E-01	1.5E+01	1.6E-04	9.7E+01	2.5E-05	2.2E+01	1.1E-04
PAOC05	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	5	1	8.50E-04	8.50E-04	1.0E+00	8.5E-04	2.9E+00	2.9E-04	5.6E+01	1.5E-05	5.6E+01	1.5E-05	5.6E+01	1.5E-05
PAOC05	VOC	1,3,5-Trimethylbenzene	108-67-8	ID	5	1	2.90E-04	2.90E-04	1.0E+00	2.9E-04	2.9E+00	1.0E-04	6.1E+01	4.8E-06	6.1E+01	4.8E-06	6.1E+01	4.8E-06
PAOC05	VOC	Vinyl Chloride	75-01-4	A	9	3	1.60E-03	7.50E-02	2.0E-03	3.8E+01	2.0E-03	3.8E+01	1.1E+00	6.8E-02	1.3E+01	5.8E-03	1.0E+00	7.5E-02
PAOC05	VOC	Xylenes (total)	1330-20-7	ID	21	7	1.40E-02	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	SVOC	Acetophenone	98-86-2	D	5	1	5.50E-04	5.50E-04	1.5E+00	3.7E-04	4.4E+00	1.3E-04	6.1E+03	9.0E-08	6.1E+03	9.0E-08	6.1E+03	9.0E-08
PAOC05	SVOC	Benzo(a)anthracene	56-55-3	B2	5	1	7.30E-04	7.30E-04	2.1E-03	3.5E-01	8.5E-03	8.6E-02					9.4E-03	7.8E-02
PAOC05	SVOC	Benzo(a)pyrene	50-32-8	B2	5	1	6.40E-04	6.40E-04	5.0E-03	1.3E-01	5.0E-03	1.3E-01					1.0E-03	6.4E-01
PAOC05	SVOC	Benzo(b)fluoranthene	205-99-2	B2	5	1	1.20E-03	1.20E-03	1.5E-03	8.0E-01	1.5E-03	8.0E-01					1.5E-03	8.0E-01
PAOC05	SVOC	Benzo(g,h,i)perylene	191-24-2	D	5	1	5.70E-04	5.70E-04	1.0E-03	5.7E-01	1.0E-03	5.7E-01					1.0E-03	5.7E-01
PAOC05	SVOC	Benzo(k)fluoranthene	207-08-9	B2	5	1	3.80E-04	3.80E-04	1.0E-03	3.8E-01	1.0E-03	3.8E-01					1.0E-03	3.8E-01
PAOC05	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	5	2	1.50E-03	2.10E-03	6.0E-03	3.5E-01	6.0E-03	3.5E-01					3.2E-01	6.6E-03
PAOC05	SVOC	Chrysene	218-01-9	B2	5	1	9.40E-04	9.40E-04	1.6E-03	5.9E-01	1.6E-03	5.9E-01					1.6E-03	5.9E-01
PAOC05	SVOC	Fluoranthene	206-44-0	D	5	1	2.50E-03	2.50E-03	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02	2.1E-01	1.2E-02
PAOC05	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	B2	5	1	4.90E-04	4.90E-04	2.0E-03	2.5E-01	2.0E-03	2.5E-01					2.0E-03	2.5E-01
PAOC05	SVOC	2-Methylnaphthalene	91-57-6	ID	5	1	3.80E-04	3.80E-04	2.6E-01	1.5E-03	7.5E-01	5.1E-04					2.5E+01	1.5E-05
PAOC05	SVOC	Naphthalene	91-20-3	C	5	1	9.20E-04	9.20E-04	5.2E-01	1.8E-03	1.5E+00	6.1E-04	3.1E+01	3.0E-05	3.1E+01	3.0E-05	3.1E+01	3.0E-05
PAOC05	SVOC	Phenanthrene	85-01-8	D	5	1	8.70E-04	8.70E-04	5.2E-02	1.7E-02	1.5E-01	5.8E-03	1.0E+00	8.7E-04	1.0E+00	8.7E-04	1.0E+00	8.7E-04
PAOC05	SVOC	Pyrene	129-00-0	NC	5	1	1.70E-03	1.70E-03	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02	1.4E-01	1.2E-02
PAOC05	PCB	PCBs (total)	1336-36-3	B2	5	1	7.15E-05	7.15E-05	5.0E-04	1.4E-01	5.0E-04	1.4E-01	4.5E-02	1.6E-03	4.5E-02	1.6E-03	3.3E-03	2.2E-02
PAOC05	INORG	Aluminum	7429-90-5	ID	5	5	1.98E-02	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	INORG	Antimony	7440-36-0		5	2	1.00E-03	1.90E-03	6.0E-03	3.2E-01	6.0E-03	3.2E-01					6.8E+01	2.8E-05
PAOC05	INORG	Arsenic	7440-38-2	A	5	1	9.20E-03	9.20E-03	1.0E-02	9.2E-01	1.0E-02	9.2E-01					4.3E+00	2.1E-03

Table 2a: Screening Summary for Groundwater
Pontiac Validation Center, Pontiac, Michigan

Area	Chem Group	Chemical	CASRN	Carc Class	Analyzed	Detected	Min Detected (mg/L)	Max Detected (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC05	INORG	Barium	7440-39-3	NC	5	5	9.50E-02	4.48E-01	2.0E+00	2.2E-01	2.0E+00	2.2E-01					1.4E+04	3.2E-05
PAOC05	INORG	Chromium III	16065-83-1	D	5	5	2.50E-03	1.14E-02	3.8E+01	3.0E-04	1.1E+02	1.0E-04					2.9E+05	3.9E-08
PAOC05	INORG	Chromium VI	18540-29-9	A	5	1	3.00E-02	3.00E-02	1.0E-01	3.0E-01	1.0E-01	3.0E-01					4.6E+02	6.5E-05
PAOC05	INORG	Copper	7440-50-8	D	5	1	7.50E-03	7.50E-03	1.4E+00	5.4E-03	4.0E+00	1.9E-03					7.4E+03	1.0E-06
PAOC05	INORG	Iron	7439-89-6	D	5	4	8.25E-02	5.75E-01	2.0E+00	2.9E-01	5.6E+00	1.0E-01					5.8E+04	9.9E-06
PAOC05	INORG	Manganese	7439-96-5	D	5	5	2.50E-03	2.33E-01	8.6E-01	2.7E-01	2.5E+00	9.3E-02					9.1E+03	2.6E-05
PAOC05	INORG	Nickel	7440-02-0	A	5	3	3.20E-03	5.50E-03	1.0E-01	5.5E-02	1.0E-01	5.5E-02					7.4E+04	7.4E-08
PAOC05	INORG	Vanadium	7440-62-2		5	3	1.80E-03	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC10	VOC	Benzene	71-43-2	A	1	1	2.20E-04	2.20E-04	5.0E-03	4.4E-02	5.0E-03	4.4E-02	5.6E+00	3.9E-05	3.5E+01	6.3E-06	1.1E+01	2.0E-05
PAOC10	VOC	Toluene	108-88-3	ID	1	1	8.80E-04	8.80E-04	1.0E+00	8.8E-04	1.0E+00	8.8E-04	5.3E+02	1.7E-06	5.3E+02	1.7E-06	5.3E+02	1.7E-06
PAOC10	VOC	1,2,4-Trimethylbenzene	95-63-6	ID	1	1	2.20E-04	2.20E-04	1.0E+00	2.2E-04	2.9E+00	7.6E-05	5.6E+01	3.9E-06	5.6E+01	3.9E-06	5.6E+01	3.9E-06
PAOC10	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	B2	2	2	1.40E-03	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	SVOC	Fluoranthene	206-44-0	D	2	1	2.30E-04	2.30E-04	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03	2.1E-01	1.1E-03
PAOC10	SVOC	Phenanthrene	85-01-8	D	2	1	2.20E-04	2.20E-04	5.2E-02	4.2E-03	1.5E-01	1.5E-03	1.0E+00	2.2E-04	1.0E+00	2.2E-04	1.0E+00	2.2E-04
PAOC10	INORG	Aluminum	7429-90-5	ID	1	1	9.27E-01	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	INORG	Antimony	7440-36-0		1	1	8.00E-04	8.00E-04	6.0E-03	1.3E-01	6.0E-03	1.3E-01					6.8E+01	1.2E-05
PAOC10	INORG	Arsenic	7440-38-2	A	1	1	4.93E-02	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	INORG	Barium	7440-39-3	NC	1	1	4.60E-02	4.60E-02	2.0E+00	2.3E-02	2.0E+00	2.3E-02					1.4E+04	3.3E-06
PAOC10	INORG	Chromium III	16065-83-1	D	1	1			3.8E+01		1.1E+02						2.9E+05	
PAOC10	INORG	Chromium VI	18540-29-9	A	1	1	8.00E-03	8.00E-03	1.0E-01	8.0E-02	1.0E-01	8.0E-02					4.6E+02	1.7E-05
PAOC10	INORG	Copper	7440-50-8	D	1	1	7.20E-03	7.20E-03	1.4E+00	5.1E-03	4.0E+00	1.8E-03					7.4E+03	9.7E-07
PAOC10	INORG	Iron	7439-89-6	D	1	1	7.67E-01	7.67E-01	2.0E+00	3.8E-01	5.6E+00	1.4E-01					5.8E+04	1.3E-05
PAOC10	INORG	Manganese	7439-96-5	D	1	1	1.11E-02	1.11E-02	8.6E-01	1.3E-02	2.5E+00	4.4E-03					9.1E+03	1.2E-06
PAOC10	INORG	Nickel	7440-02-0	A	1	1	3.30E-03	3.30E-03	1.0E-01	3.3E-02	1.0E-01	3.3E-02					7.4E+04	4.5E-08
PAOC10	INORG	Vanadium	7440-62-2		1	1	4.88E-02	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
PAOC11/PAOC14	VOC	1,3-Dichlorobenzene	541-73-1	D	2	2	2.10E-04	2.20E-04	6.6E-03	3.3E-02	1.9E-02	1.2E-02					2.0E+00	1.1E-04
PAOC11/PAOC14	INORG	Aluminum	7429-90-5	ID	2	1	9.80E-03	9.80E-03	3.0E-01	3.3E-02	4.1E+00	2.4E-03					6.4E+04	1.5E-07
PAOC11/PAOC14	INORG	Barium	7440-39-3	NC	2	2	2.96E-01	3.10E-01	2.0E+00	1.6E-01	2.0E+00	1.6E-01					1.4E+04	2.2E-05
PAOC11/PAOC14	INORG	Chromium III	16065-83-1	D	2	2	2.50E-03	2.50E-03	3.8E+01	6.6E-05	1.1E+02	2.3E-05					2.9E+05	8.6E-09
PAOC11/PAOC14	INORG	Cyanide (amenable)	57-12-5A		2	1	7.10E-03	7.10E-03										
PAOC11/PAOC14	INORG	Manganese	7439-96-5	D	2	2	1.14E-01	1.21E-01	8.6E-01	1.4E-01	2.5E+00	4.8E-02					9.1E+03	1.3E-05
PAOC13/PAOC19	VOC	Acetone	67-64-1	ID	1	1	7.90E-02	7.90E-02	7.3E-01	1.1E-01	2.1E+00	3.8E-02	1.0E+06	7.9E-08	1.0E+06	7.9E-08	3.1E+04	2.5E-06
PAOC13/PAOC19	VOC	2-Butanone	78-93-3	ID	1	1	1.40E-02	1.40E-02	1.3E+01	1.1E-03	3.8E+01	3.7E-04	2.4E+05	5.8E-08	2.4E+05	5.8E-08	2.4E+05	5.8E-08
PAOC13/PAOC19	VOC	Carbon Disulfide	75-15-0		1	1	1.80E-03	1.80E-03	8.0E-01	2.3E-03	2.3E+00	7.8E-04	2.5E+02	7.2E-06	5.5E+02	3.3E-06	1.2E+03	1.5E-06
PAOC13/PAOC19	VOC	cis-1,2-Dichloroethene	156-59-2	ID	1	1	6.00E-04	6.00E-04	7.0E-02	8.6E-03	7.0E-02	8.6E-03	9.3E+01	6.5E-06	2.1E+02	2.9E-06	2.0E+02	3.0E-06
PAOC13/PAOC19	VOC	4-Methyl-2-pentanone	108-10-1	ID	1	1	3.00E-03	3.00E-03	1.8E+00	1.7E-03	5.2E+00	5.8E-04	2.0E+04	1.5E-07	2.0E+04	1.5E-07	1.3E+04	2.3E-07
PAOC13/PAOC19	VOC	Toluene	108-88-3	ID	1	1	5.80E-04	5.80E-04	1.0E+00	5.8E-04	1.0E+00	5.8E-04	5.3E+02	1.1E-06	5.3E+02	1.1E-06	5.3E+02	1.1E-06
PAOC13/PAOC19	VOC	Vinyl Chloride	75-01-4	A	1	1	7.90E-04	7.90E-04	2.0E-03	4.0E-01	2.0E-03	4.0E-01	1.1E+00	7.2E-04	1.3E+01	6.1E-05	1.0E+00	7.9E-04
Notes:																		
Only constituents detected in each area are shown.																		
The drinking water criteria are based on the following hierarchy: State MCL, Federal MCL, Region 9 Tap Water Ingestion Criteria at the lower of the criteria calculated at either the target cancer risk of 1E-5 or target hazard quotient of 1.																		
The criteria for non-drinking water are the lower of the criteria at either the target cancer risk of 1E-5 or target hazard quotient of 1.																		
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																		
The concentrations for the Xylene isomers (m/p and o) were summed before comparing to the criteria for Xylenes (total).																		
Ratios of concentration to the criteria greater than 1 are shaded in bold.																		
SM - The criterion is the State MCL.																		
C - The criterion is based on cancer risk at a target cancer risk of 1E-5.																		
NC - The criterion is based on noncancer effects at a hazard quotient of 1.																		
Chem Group - chemical group																		
Carc Class - USEPA Weight-of-Evidence Cancer Classification																		
DWC - MDEQ Drinking Water Criteria																		
GCC - MDEQ Groundwater Contact Criteria																		
GVIIC - MDEQ Groundwater Volatilization to Indoor Air Inhalation Criteria																		

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	MW-11-07	11/27/07	INORG	Aluminum	7429-90-5	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	MW-19-07	11/27/07	INORG	Aluminum	7429-90-5	4.63E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC01	MW-2-07	11/28/07	VOC	Trichloroethene	79-01-6	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	MW-2-07	11/28/07	PCB	PCBs (total)	1336-36-3	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	MW-2-07	11/28/07	INORG	Manganese	7439-96-5	2.15E+00	8.6E-01	2.5E+00	2.5E+00	8.6E-01					9.1E+03	2.4E-04
PAOC02	MW-32-07	01/09/08	INORG	Aluminum	7429-90-5	3.25E-01	3.0E-01	1.1E+00	4.1E+00	7.9E-02					6.4E+04	5.1E-06
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.67E+00	2.0E+00	3.8E+00	5.6E+00	1.4E+00					5.8E+04	1.3E-04
PAOC02	MW-63-08	04/07/08	INORG	Lead	7439-92-1	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						
PAOC02	MW-68-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.00E-04	5.0E-03	6.0E-02	5.0E-03	6.0E-02					1.0E-03	3.0E-01
PAOC02	MW-68-08	04/07/08	INORG	Aluminum	7429-90-5	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	MW-74-08	04/07/08	VOC	1,1-Dichloroethene	75-35-4	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	MW-74-08	04/07/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	MW-74-08	04/07/08	VOC	1,1,1-Trichloroethane	71-55-6	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	MW-74-08	04/07/08	VOC	Trichloroethene	79-01-6	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)anthracene	56-55-3	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(b)fluoranthene	205-99-2	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(g,h,i)perylene	191-24-2	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(k)fluoranthene	207-08-9	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Chrysene	218-01-9	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	MW-74-08	04/07/08	SVOC	Dibenz(a,h)anthracene	53-70-3	6.10E-04	2.0E-03	3.1E-01	2.0E-03	3.1E-01					2.0E-03	3.1E-01
PAOC02	MW-74-08	04/07/08	SVOC	Indeno(1,2,3-cd)pyrene	193-39-5	2.00E-03	2.0E-03	1.0E+00	2.0E-03	1.0E+00					2.0E-03	1.0E+00
PAOC02	MW-74-08	04/07/08	INORG	Aluminum	7429-90-5	4.59E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC03	MW-10-07	11/27/07	INORG	Aluminum	7429-90-5	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	MW-10-07	11/27/07	INORG	Lead	7439-92-1	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	MW-10-07	11/27/07	INORG	Vanadium	7440-62-2	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC05	MW-1	05/01/90	VOC	Benzene	71-43-2	9.90E-01	5.0E-03	2.0E+02	5.0E-03	2.0E+02	5.6E+00	1.8E-01	3.5E+01	2.8E-02	1.1E+01	9.0E-02
PAOC05	MW-1	05/01/90	VOC	Vinyl Chloride	75-01-4	7.50E-02	2.0E-03	3.8E+01	2.0E-03	3.8E+01	1.1E+00	6.8E-02	1.3E+01	5.8E-03	1.0E+00	7.5E-02
PAOC05	MW-1	03/11/93	VOC	Benzene	71-43-2	3.00E+00	5.0E-03	6.0E+02	5.0E-03	6.0E+02	5.6E+00	5.4E-01	3.5E+01	8.6E-02	1.1E+01	2.7E-01
PAOC05	MW-1	01/10/94	VOC	Benzene	71-43-2	2.60E+00	5.0E-03	5.2E+02	5.0E-03	5.2E+02	5.6E+00	4.6E-01	3.5E+01	7.4E-02	1.1E+01	2.4E-01
PAOC05	MW-1	01/10/94	VOC	Benzene	71-43-2	2.70E+00	5.0E-03	5.4E+02	5.0E-03	5.4E+02	5.6E+00	4.8E-01	3.5E+01	7.7E-02	1.1E+01	2.5E-01
PAOC05	MW-3	05/01/90	VOC	Benzene	71-43-2	5.30E-03	5.0E-03	1.1E+00	5.0E-03	1.1E+00	5.6E+00	9.5E-04	3.5E+01	1.5E-04	1.1E+01	4.8E-04
PAOC05	MW-3	05/01/90	VOC	Vinyl Chloride	75-01-4	1.20E-02	2.0E-03	6.0E+00	2.0E-03	6.0E+00	1.1E+00	1.1E-02	1.3E+01	9.2E-04	1.0E+00	1.2E-02
PAOC05	MW-33-07	01/09/08	INORG	Aluminum	7429-90-5	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	MW-33-07	01/09/08	INORG	Vanadium	7440-62-2	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC05	MW-34-07	01/08/08	INORG	Aluminum	7429-90-5	3.66E-01	3.0E-01	1.2E+00	4.1E+00	8.9E-02					6.4E+04	5.7E-06
PAOC05	MW-37-07	01/08/08	SVOC	Benzo(a)pyrene	50-32-8	6.40E-04	5.0E-03	1.3E-01	5.0E-03	1.3E-01					1.0E-03	6.4E-01
PAOC05	MW-37-07	01/08/08	SVOC	Benzo(b)fluoranthene	205-99-2	1.20E-03	1.5E-03	8.0E-01	1.5E-03	8.0E-01					1.5E-03	8.0E-01
PAOC05	MW-6	01/10/94	VOC	Benzene	71-43-2	9.70E-01	5.0E-03	1.9E+02	5.0E-03	1.9E+02	5.6E+00	1.7E-01	3.5E+01	2.8E-02	1.1E+01	8.8E-02
PAOC05	MW-6	02/01/94	VOC	Benzene	71-43-2	1.40E-02	5.0E-03	2.8E+00	5.0E-03	2.8E+00	5.6E+00	2.5E-03	3.5E+01	4.0E-04	1.1E+01	1.3E-03
PAOC05	PW-1 #1	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #1	11/01/90	VOC	Ethyl Benzene	100-41-4	1.70E+00	7.0E-01	2.4E+00	7.0E-01	2.4E+00	1.1E+02	1.5E-02	1.7E+02	1.0E-02	1.7E+02	1.0E-02
PAOC05	PW-1 #1	11/01/90	VOC	Toluene	108-88-3	1.80E+01	1.0E+00	1.8E+01	1.0E+00	1.8E+01	5.3E+02	3.4E-02	5.3E+02	3.4E-02	5.3E+02	3.4E-02
PAOC05	PW-1 #1	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #2	11/01/90	VOC	Benzene	71-43-2	1.40E+01	5.0E-03	2.8E+03	5.0E-03	2.8E+03	5.6E+00	2.5E+00	3.5E+01	4.0E-01	1.1E+01	1.3E+00
PAOC05	PW-1 #2	11/01/90	VOC	Ethyl Benzene	100-41-4	2.10E+00	7.0E-01	3.0E+00	7.0E-01	3.0E+00	1.1E+02	1.9E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	PW-1 #2	11/01/90	VOC	Toluene	108-88-3	2.00E+01	1.0E+00	2.0E+01	1.0E+00	2.0E+01	5.3E+02	3.8E-02	5.3E+02	3.8E-02	5.3E+02	3.8E-02
PAOC05	PW-1 #2	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #3	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #3	11/01/90	VOC	Ethyl Benzene	100-41-4	1.40E+00	7.0E-01	2.0E+00	7.0E-01	2.0E+00	1.1E+02	1.3E-02	1.7E+02	8.2E-03	1.7E+02	8.2E-03
PAOC05	PW-1 #3	11/01/90	VOC	Toluene	108-88-3	1.80E+01	1.0E+00	1.8E+01	1.0E+00	1.8E+01	5.3E+02	3.4E-02	5.3E+02	3.4E-02	5.3E+02	3.4E-02
PAOC05	PW-1 #3	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC05	PW-1 #4	11/01/90	VOC	Benzene	71-43-2	1.20E+01	5.0E-03	2.4E+03	5.0E-03	2.4E+03	5.6E+00	2.1E+00	3.5E+01	3.4E-01	1.1E+01	1.1E+00
PAOC05	PW-1 #4	11/01/90	VOC	Ethyl Benzene	100-41-4	1.30E+00	7.0E-01	1.9E+00	7.0E-01	1.9E+00	1.1E+02	1.2E-02	1.7E+02	7.6E-03	1.7E+02	7.6E-03

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC05	PW-1 #4	11/01/90	VOC	Toluene	108-88-3	1.70E+01	1.0E+00	1.7E+01	1.0E+00	1.7E+01	5.3E+02	3.2E-02	5.3E+02	3.2E-02	5.3E+02	3.2E-02
PAOC05	PW-1 #4	11/01/90	VOC	Xylenes (total)	1330-20-7	1.50E+01	1.0E+01	1.5E+00	1.0E+01	1.5E+00	1.9E+02	7.9E-02	1.9E+02	7.9E-02	1.9E+02	7.9E-02
PAOC05	PW-1 #5	11/01/90	VOC	Benzene	71-43-2	1.30E+01	5.0E-03	2.6E+03	5.0E-03	2.6E+03	5.6E+00	2.3E+00	3.5E+01	3.7E-01	1.1E+01	1.2E+00
PAOC05	PW-1 #5	11/01/90	VOC	Ethyl Benzene	100-41-4	2.00E+00	7.0E-01	2.9E+00	7.0E-01	2.9E+00	1.1E+02	1.8E-02	1.7E+02	1.2E-02	1.7E+02	1.2E-02
PAOC05	PW-1 #5	11/01/90	VOC	Toluene	108-88-3	2.20E+01	1.0E+00	2.2E+01	1.0E+00	2.2E+01	5.3E+02	4.2E-02	5.3E+02	4.2E-02	5.3E+02	4.2E-02
PAOC05	PW-1 #5	11/01/90	VOC	Xylenes (total)	1330-20-7	1.60E+01	1.0E+01	1.6E+00	1.0E+01	1.6E+00	1.9E+02	8.4E-02	1.9E+02	8.4E-02	1.9E+02	8.4E-02
PAOC10	MW-35-07	01/08/08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	MW-35-07	01/09/08	INORG	Aluminum	7429-90-5	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	MW-35-07	01/09/08	INORG	Arsenic	7440-38-2	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	MW-35-07	01/09/08	INORG	Vanadium	7440-62-2	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
Note:																
See notes on Table 2a.																

Table 3a: Upper-Bound Cumulative Cancer Risk and HI estimates for Potential Soil Exposures Pontiac Validation Center, Pontiac, Michigan							
Routine Worker Contact		Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI	Risk	HI
5E-05	4E+01	7E-05	7E+02	4E-06	6E+00	8E-06	2E+02
Notes:							
Upper-bound cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site.							
Values in bold and shaded in gray exceed USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.							
Routine worker estimates assume exposure for 250 days/year for 25 years.							
Maintenance worker estimates assume exposure for 30 days/year for 10 years.							
Construction worker estimates assume exposure for 250 days/year for 1 year.							

Table 3b: High-End Cumulative Cancer Risk and HI Estimates for Potential Soil Exposures Pontiac Validation Center, Pontiac, Michigan							
Routine Worker Contact		Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI	Risk	HI
3E-05	5E-01	5E-05	1E+00	3E-06	3E-01	4E-06	2E+00
Notes:							
Values in bold and shaded in gray exceed the USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.							
High-end cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site except as follows:							
Results from the following samples: "Floor 1","West Wall 1","North Wall 1","North Wall 2","A 14-15","S-6318-062895-DJC-E005","S-6318-063095-DJC-E012","S-6318-063095-DJC-E013","S-6318-063095-DJC-E014","S-6318-070695-DJC-E017","S-6318-070695-DJC-E018","S-6318-071495-EVD-031","S-6318-071495-EVD-032","SS-8-A-Side-Area1","SS-9-A","S-6318-070595-DJC-E016", and "C 14-15" were removed from the calculations.							
Routine worker, maintenance worker, and construction worker risk estimates included 95% Upper Confidence Limits on the mean (95% UCLs) for naphthalene, PCBs (total), manganese, and mercury.							
Vapor intrusion risk estimates included the vertically averaged concentration for 1,2,4-trimethylbenzene from location MW-33-07.							
Routine worker estimates assume exposure for 250 days/year for 25 years.							
Maintenance worker estimates assume exposure for 30 days/year for 10 years.							
Construction worker estimates assume exposure for 250 days/year for 1 year.							

Table 3c: High-End Noncancer Risk Estimates for the Construction Worker Exposure to Soil: Critical Effects Summary Pontiac Validation Center, Pontiac, Michigan					
Chem Group	Chemical	CASRN	Most Significant Pathway	Critical Effects	HQ
SVOC	Naphthalene	91-20-3	Vapor Inhalation	Nasal effects: hyperplasia and metaplasia in respiratory and olfactory epithelium, respectively	2E-01
PCB	PCBs (total)	1336-36-3	Ingestion	Neurological	3E-01
INORG	Manganese	7439-96-5	Particulate Inhalation	Impairment of neurobehavioral function	5E-01
VARIOUS	Remaining Chemicals	Various	Various	Various	6E-01
References:					
USEPA. Integrated Risk Information System (IRIS). On-line database.					
ATSDR. 2007. Minimal Risk Levels. November.					

Table 4: Upper-Bound Cumulative Cancer Risk and HI Estimates for Potential Groundwater Exposure Pontiac Validation Center, Pontiac, Michigan					
Industrial Vapor Intrusion		Maintenance Worker Contact		Construction Worker Contact	
Risk	HI	Risk	HI	Risk	HI
2E-05	4E-01	4E-05	1E+00	4E-06	5E-01
Notes:					
Upper-bound cancer risk and HI estimates are based on the maximum detected concentrations of each constituent in soil at the Site.					
Maintenance worker estimates assume exposure for 5 days/year for 10 years.					
Construction worker estimates assume exposure for 5 days/year for 1 year.					

Table 5: Cumulative Cancer Risk and HI Estimates for Exposure to NAPL Pontiac Validation Center, Pontiac, MI		
Receptor	Cumulative Cancer Risk	HI
Routine Worker Vapor Intursion	3E-07	4E-01
Maintenance Worker Contact	3E-06	4E+00
Notes:		
Values in bold and shaded in gray exceed the USEPA's cumulative cancer risk or HI limits of 1E-4 and 1, respectively.		
Direct contact exposure routes include dermal contact with, and inhalation of vapors from NAPL.		

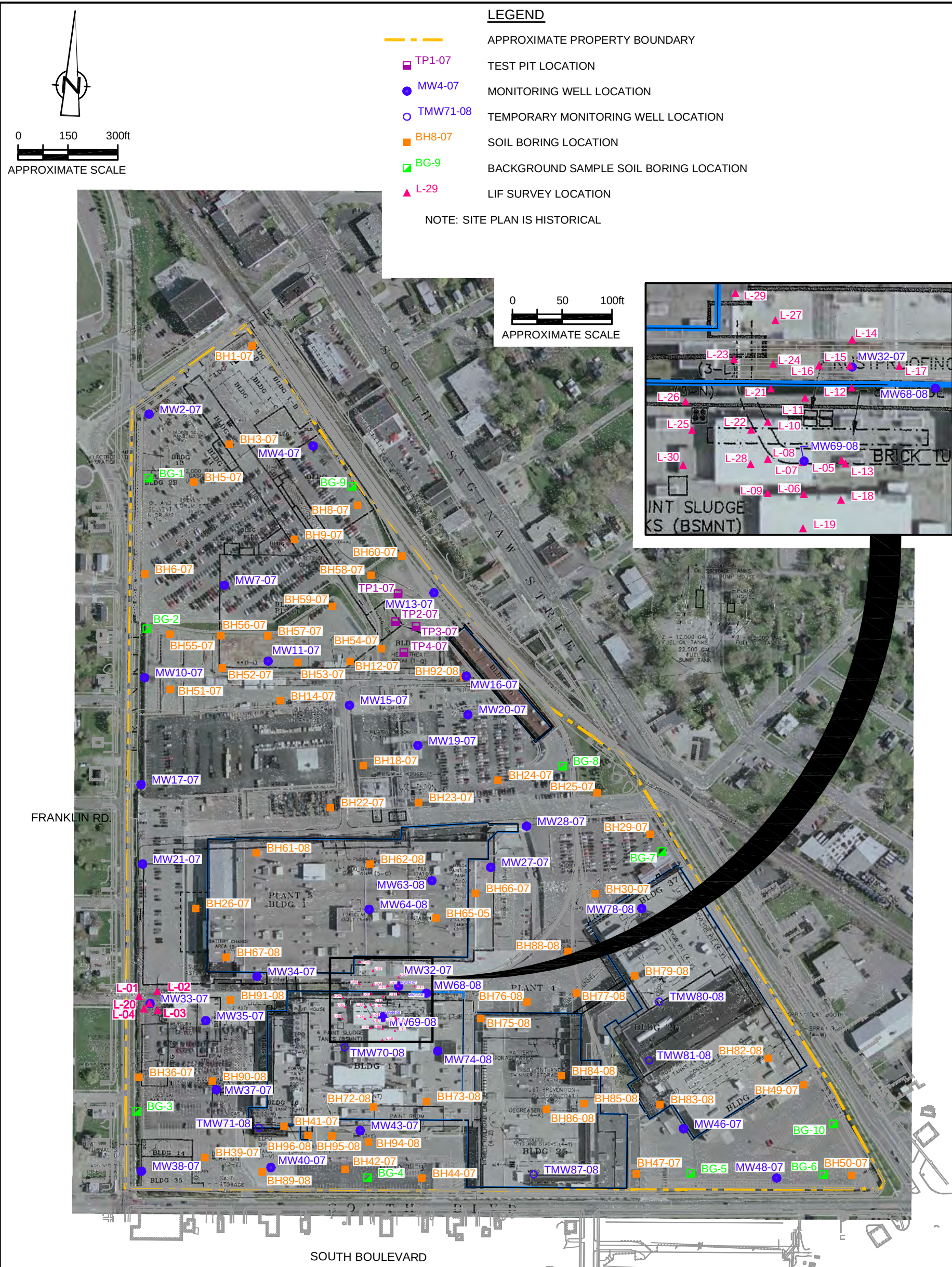
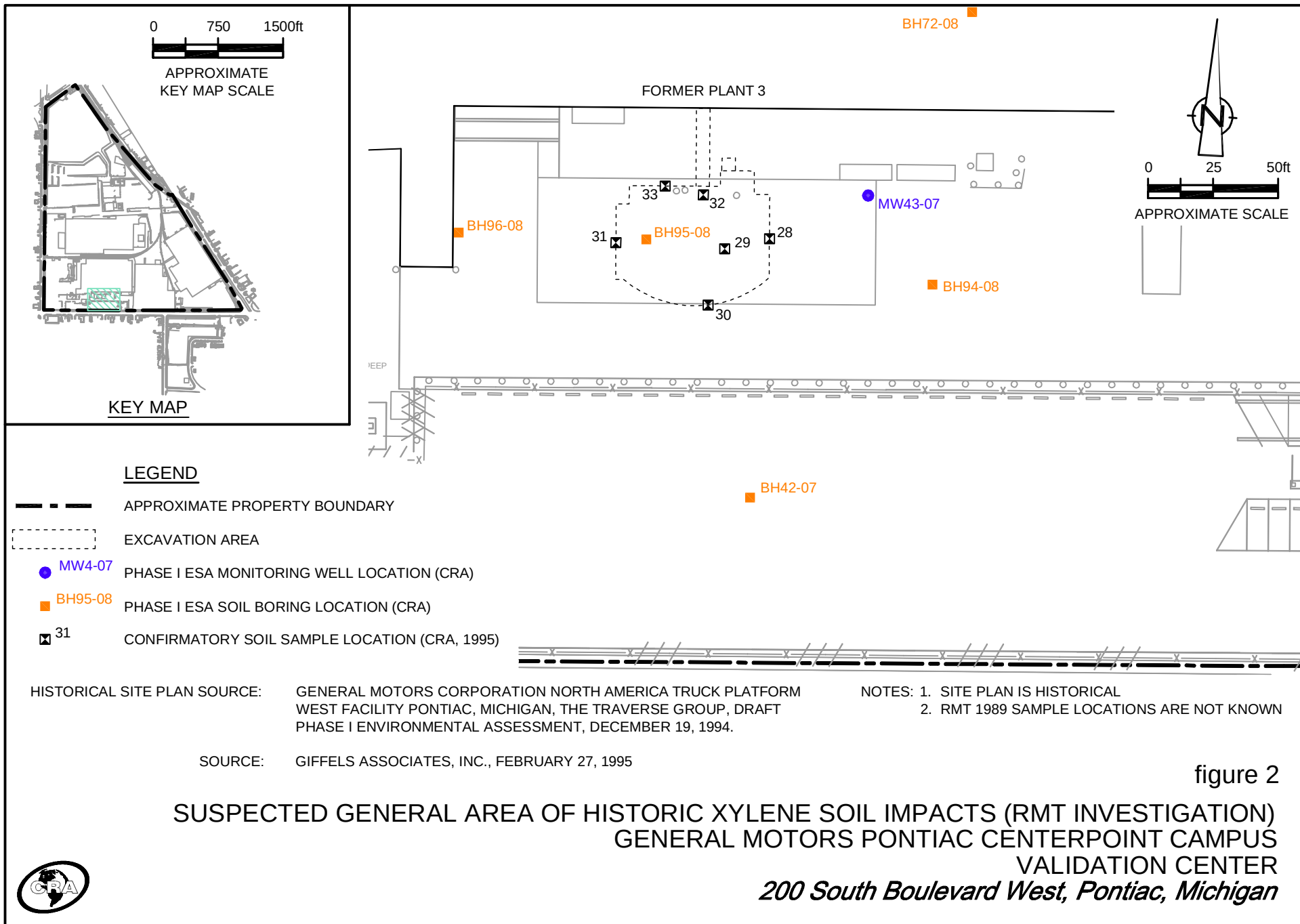
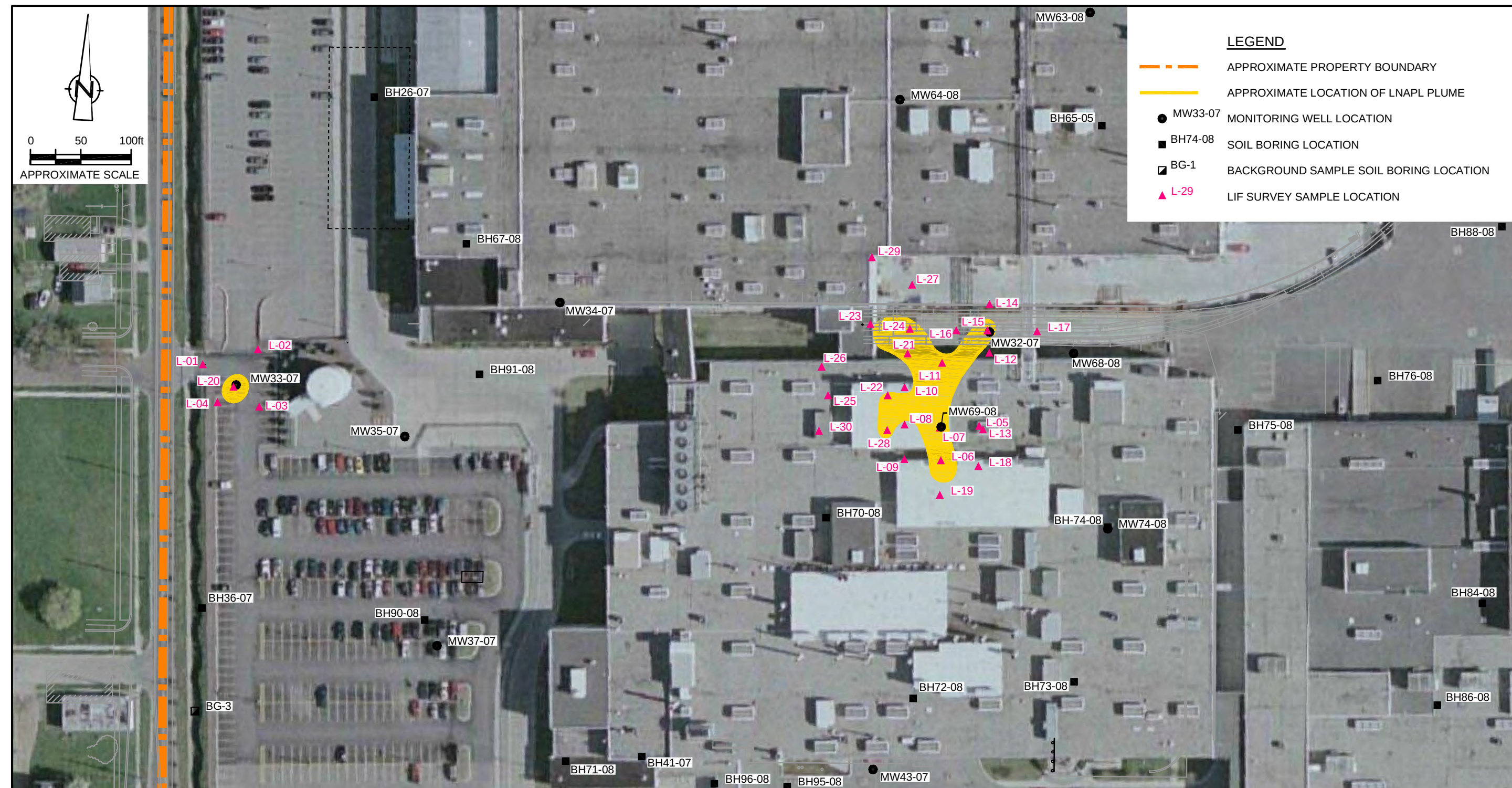


figure 1

COMPLETED SOIL BORING LOCATIONS
GENERAL MOTORS PONTIAC CENTERPOINT CAMPUS
VALIDATION CENTER
200 South Boulevard West, Pontiac, Michigan





HISTORICAL SITE PLAN SOURCE: GENERAL MOTORS CORPORATION NORTH AMERICA TRUCK PLATFORM WEST FACILITY PONTIAC, MICHIGAN, THE TRAVERSE GROUP, DRAFT PHASE I ENVIRONMENTAL ASSESSMENT, DECEMBER 19, 1994.

NOTE: SITE PLAN IS HISTORICAL

figure 3
LIF INVESTIGATION LOCATIONS
GENERAL MOTORS PONTIAC CENTERPOINT CAMPUS
VALIDATION CENTER
200 South Boulevard West, Pontiac, Michigan



Table 1b: Exceedance Summary for Soil Pontiac Validation Center, Pontiac, Michigan																									
Area	Location	Top Depth (ft)	Bottom Depth (ft)	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/kg)	Site Specific Background (mg/kg)	Residential SVIIC (mg/kg)	Ratio of Conc to Res SVIIC	Residential VSIC (mg/kg)	Ratio of Conc to Res VSIC	Residential PSIC (mg/kg)	Ratio of Conc to Res PSIC	Residential DCC (mg/kg)	Ratio of Conc to Res DCC	Industrial SVIIC (mg/kg)	Ratio of Conc to Ind SVIIC	Industrial VSIC (mg/kg)	Ratio of Conc to Ind VSIC	Industrial PSIC (mg/kg)	Ratio of Conc to Ind PSIC	Industrial II DCC (mg/kg)	Ratio of Conc to Industrial II DCC
Background	BG-06	7	9	03/07/08	INORG	Manganese	7439-96-5	4.11E+03	4.40E+02					3.3E+03	1.1E+00	2.5E+04	1.5E-01					1.5E+03	2.4E+00	9.0E+04	4.1E-02
PAOC02	MW-74-08	0	2	03/14/08	VOC	1,1-Dichloroethene	75-35-4	1.10E-01		6.2E-02	1.8E+00	1.1E+00	1.0E-01	6.2E+04	1.8E-06	2.0E+02	5.5E-04	3.3E-01	3.3E-01	3.7E+00	3.0E-02	7.8E+04	1.4E-06	5.7E+02	1.9E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	1,1-Dichloroethene	75-35-4	2.60E-01		6.2E-02	4.2E+00	1.1E+00	2.4E-01	6.2E+04	4.2E-06	2.0E+02	1.3E-03	3.3E-01	7.9E-01	3.7E+00	7.0E-02	7.8E+04	3.3E-06	5.7E+02	4.6E-04
PAOC02	MW-74-08	8	10	03/14/08	VOC	Trichloroethene	79-01-6	7.60E+00		7.1E+00	1.1E+00	7.8E+01	9.7E-02	1.8E+06	4.2E-06	5.0E+02	1.5E-02	3.7E+01	2.1E-01	2.6E+02	2.9E-02	2.3E+06	3.3E-06	5.0E+02	1.5E-02
PAOC04	BH-92-08	7.5	9.5	03/14/08	INORG	Arsenic	7440-38-2	1.21E+01						7.2E+02	1.7E-02	7.6E+00	1.6E+00					9.1E+02	1.3E-02	3.7E+01	3.3E-01
PAOC05	BH-36-07	0	2	12/03/07	SVOC	Benzo(a)pyrene	50-32-8	2.60E+00						1.5E+03	1.7E-03	2.0E+00	1.3E+00					1.9E+03	1.4E-03	8.0E+00	3.3E-01
PAOC06	BH-47-07	17.5	20	10/09/07	INORG	Arsenic	7440-38-2	1.11E+01						7.2E+02	1.5E-02	7.6E+00	1.5E+00					9.1E+02	1.2E-02	3.7E+01	3.0E-01
PAOC12	MW-13-07	0	2	10/18/07	INORG	Lead	7439-92-1	4.46E+02						1.0E+05	4.5E-03	4.0E+02	1.1E+00					4.4E+04	1.0E-02	9.0E+02	5.0E-01
PAOC21	MW-28-07	0	2	10/17/07	INORG	Manganese	7439-96-5	2.27E+03	4.40E+02					3.3E+03	5.5E-01	2.5E+04	7.3E-02					1.5E+03	1.2E+00	9.0E+04	2.0E-02
PAOC22	BH-72-08	12	14	03/13/08	PCB	PCBs (total)	1336-36-3	2.20E+01		3.0E+03	7.3E-03	2.4E+02	9.2E-02	5.2E+03	4.2E-03	4.0E+00	5.5E+00	1.6E+04	1.4E-03	8.1E+02	2.7E-02	6.5E+03	3.4E-03	1.6E+01	1.4E+00
Notes:																									
Only constituents exceeding the listed MDEQ criteria are shown.																									
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																									
Background concentrations from MDEQ Part 201 (MDEQ 2006) were considered for manganese. The concentrations of all other constituents were assumed to be site-related.																									
Ratios of site-related concentration to the criteria greater than 1 are shaded in bold.																									
Chem Group - chemical group																									
SVIIC - MDEQ Soil Volatilization to Indoor Air Inhalation Criteria																									
VSIC - MDEQ Volatile Soil Inhalation Criteria (ambient air)																									
PSIC - MDEQ Particulate Soil Inhalation Criteria																									
DCC - MDEQ Direct Contact Criteria (mg/kg)																									

Table 2b: Exceedance Summary for Groundwater Pontiac Validation Center, Pontiac, Michigan																
Area	Location	Sample Date	Chem Group	Chemical	CASRN	Conc (mg/L)	Residential DWC (mg/L)	Ratio of Max Detect to Res DWC	Industrial DWC (mg/L)	Ratio of Max Detect to Ind DWC	Residential GVIIC (mg/L)	Ratio of Max Detect to Res GVIIC	Industrial GVIIC (mg/L)	Ratio of Max Detect to Ind GVIIC	GCC (mg/L)	Ratio of Max Detect to GCC
PAOC01	MW-11-07	11/27/07	INORG	Aluminum	7429-90-5	5.23E-01	3.0E-01	1.7E+00	4.1E+00	1.3E-01					6.4E+04	8.2E-06
PAOC01	MW-19-07	11/27/07	INORG	Aluminum	7429-90-5	4.63E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC01	MW-2-07	11/28/07	VOC	Trichloroethene	79-01-6	5.10E-02	5.0E-03	1.0E+01	5.0E-03	1.0E+01	1.5E+01	3.4E-03	9.7E+01	5.3E-04	2.2E+01	2.3E-03
PAOC01	MW-2-07	11/28/07	PCB	PCBs (total)	1336-36-3	6.20E-04	5.0E-04	1.2E+00	5.0E-04	1.2E+00	4.5E-02	1.4E-02	4.5E-02	1.4E-02	3.3E-03	1.9E-01
PAOC01	MW-2-07	11/28/07	INORG	Manganese	7439-96-5	2.15E+00	8.6E-01	2.5E+00	2.5E+00	8.6E-01					9.1E+03	2.4E-04
PAOC02	MW-32-07	01/09/08	INORG	Aluminum	7429-90-5	3.25E-01	3.0E-01	1.1E+00	4.1E+00	7.9E-02					6.4E+04	5.1E-06
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.88E+00	2.0E+00	3.9E+00	5.6E+00	1.4E+00					5.8E+04	1.4E-04
PAOC02	MW-48-07	04/08/08	INORG	Iron	7439-89-6	7.67E+00	2.0E+00	3.8E+00	5.6E+00	1.4E+00					5.8E+04	1.3E-04
PAOC02	MW-63-08	04/07/08	INORG	Lead	7439-92-1	2.25E-02	4.0E-03	5.6E+00	4.0E-03	5.6E+00						
PAOC02	MW-68-08	04/07/08	INORG	Aluminum	7429-90-5	4.67E-01	3.0E-01	1.6E+00	4.1E+00	1.1E-01					6.4E+04	7.3E-06
PAOC02	MW-74-08	04/07/08	VOC	1,1-Dichloroethene	75-35-4	5.70E-02	7.0E-03	8.1E+00	7.0E-03	8.1E+00	2.0E-01	2.9E-01	1.3E+00	4.4E-02	1.1E+01	5.2E-03
PAOC02	MW-74-08	04/07/08	VOC	cis-1,2-Dichloroethene	156-59-2	7.60E-02	7.0E-02	1.1E+00	7.0E-02	1.1E+00	9.3E+01	8.2E-04	2.1E+02	3.6E-04	2.0E+02	3.8E-04
PAOC02	MW-74-08	04/07/08	VOC	1,1,1-Trichloroethane	71-55-6	1.00E+00	2.0E-01	5.0E+00	2.0E-01	5.0E+00	6.6E+02	1.5E-03	1.3E+03	7.7E-04	1.3E+03	7.7E-04
PAOC02	MW-74-08	04/07/08	VOC	Trichloroethene	79-01-6	2.10E+00	5.0E-03	4.2E+02	5.0E-03	4.2E+02	1.5E+01	1.4E-01	9.7E+01	2.2E-02	2.2E+01	9.5E-02
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)anthracene	56-55-3	3.40E-03	2.1E-03	1.6E+00	8.5E-03	4.0E-01					9.4E-03	3.6E-01
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(a)pyrene	50-32-8	3.30E-03	5.0E-03	6.6E-01	5.0E-03	6.6E-01					1.0E-03	3.3E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(b)fluoranthene	205-99-2	4.10E-03	1.5E-03	2.7E+00	1.5E-03	2.7E+00					1.5E-03	2.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(g,h,i)perylene	191-24-2	2.20E-03	1.0E-03	2.2E+00	1.0E-03	2.2E+00					1.0E-03	2.2E+00
PAOC02	MW-74-08	04/07/08	SVOC	Benzo(k)fluoranthene	207-08-9	1.70E-03	1.0E-03	1.7E+00	1.0E-03	1.7E+00					1.0E-03	1.7E+00
PAOC02	MW-74-08	04/07/08	SVOC	Chrysene	218-01-9	3.30E-03	1.6E-03	2.1E+00	1.6E-03	2.1E+00					1.6E-03	2.1E+00
PAOC02	MW-74-08	04/07/08	INORG	Aluminum	7429-90-5	4.59E-01	3.0E-01	1.5E+00	4.1E+00	1.1E-01					6.4E+04	7.2E-06
PAOC03	MW-10-07	11/27/07	INORG	Aluminum	7429-90-5	6.44E-01	3.0E-01	2.1E+00	4.1E+00	1.6E-01					6.4E+04	1.0E-05
PAOC03	MW-10-07	11/27/07	INORG	Lead	7439-92-1	5.60E-03	4.0E-03	1.4E+00	4.0E-03	1.4E+00						
PAOC03	MW-10-07	11/27/07	INORG	Vanadium	7440-62-2	5.40E-03	4.5E-03	1.2E+00	6.2E-02	8.7E-02					9.7E+02	5.6E-06
PAOC05	MW-33-07	01/09/08	INORG	Aluminum	7429-90-5	9.29E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.5E-05
PAOC05	MW-33-07	01/09/08	INORG	Vanadium	7440-62-2	7.20E-03	4.5E-03	1.6E+00	6.2E-02	1.2E-01					9.7E+02	7.4E-06
PAOC05	MW-34-07	01/08/08	INORG	Aluminum	7429-90-5	3.66E-01	3.0E-01	1.2E+00	4.1E+00	8.9E-02					6.4E+04	5.7E-06
PAOC10	MW-35-07	01/08/08	SVOC	bis(2-Ethylhexyl)phthalate	117-81-7	6.90E-03	6.0E-03	1.2E+00	6.0E-03	1.2E+00					3.2E-01	2.2E-02
PAOC10	MW-35-07	01/09/08	INORG	Aluminum	7429-90-5	9.27E-01	3.0E-01	3.1E+00	4.1E+00	2.3E-01					6.4E+04	1.4E-05
PAOC10	MW-35-07	01/09/08	INORG	Arsenic	7440-38-2	4.93E-02	1.0E-02	4.9E+00	1.0E-02	4.9E+00					4.3E+00	1.1E-02
PAOC10	MW-35-07	01/09/08	INORG	Vanadium	7440-62-2	4.88E-02	4.5E-03	1.1E+01	6.2E-02	7.9E-01					9.7E+02	5.0E-05
Notes:																
Only constituents exceeding the listed MDEQ criteria are shown.																
The concentrations for all polychlorinated biphenyls (PCBs) Aroclors were summed before comparing to the criteria for PCBs (total).																
Ratios of concentration to the criteria greater than 1 are shaded in bold.																
Chem Group - chemical group																
DWC - MDEQ Drinking Water Criteria																
GVIIC - MDEQ Groundwater Volatilization to Indoor Air Inhalation Criteria																
GCC - MDEQ Groundwater Contact Criteria																