CONESTOGA-ROVERS & ASSOCIATES

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MEMORANDUM

TO:	Peter Ramanauskas/EPA	REF. NO.:	017322
CC:	Grant Trigger, RACER		
	Dave Favero/RACER		
FROM:	Thomas Kinney/MS/ds/16 TK	DATE:	November 16, 2012
RE:	**Phase III Environmental Site Assessment Data Summary and Scope of Work for Additional 2012 Field Work RACER PCC-Validation Pontiac, Michigan**		

INTRODUCTION

Conestoga-Rovers & Associates Inc. (CRA) has prepared this Phase III Environmental Site Assessment (ESA) Data Summary and Scope of Work (SOW) for Additional 2012 Field Work on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust. The Phase III ESA was completed at the PCC-Validation Site located in Pontiac, Michigan (Site)to further investigate the eight areas of interest (AOIs) identified in Table 5.3 of the 2011 Supplemental Current Conditions Report (CCR). Based on the results of the Phase III ESA and historical data, additional investigation is necessary in six AOIs. This SOW provides the proposed scope of work for additional 2012 field activities. The Site Location is presented on Figure 1. A Site Plan is presented on Figure 2.

OVERVIEW

Based on review of historical documents and CRA field investigations in 2009 and 2010, a draft CCR was completed in August 2011. In the 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 comments on the draft CCR from the U.S. Environmental Protection Agency (EPA) Corrective Action Project Manager, a Supplemental CCR was submitted to the EPA on December 12, 2011. The Supplemental CCR was completed to refine further action at AOIs based on future land use restrictions. The future land restrictions 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, no further action is required for an AOI with GSI, SVIIC, GVIIC, DWC and DWPC pathway exceedances.

In August 2012, the EPA approved the Sampling and Analysis Plan and Fundamental Quality Assurance Project Plan (SAP/QAPP). The SAP/QAPP was created to investigate eight AOIs identified in Table 5.3 of the December 2011 Supplemental CCR.

REGISTERED COMPANY FOR ISO 9001 ENGINEERING DESIGN

PHASE III ENVIRONMENTAL SITE ASSESSMENT

A Phase III ESA was 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. Analytical results from soil and groundwater samples were non-detect or below applicable Cleanup Criteria.

See Figure 3 for a Site map with soil boring locations and soil analytical results. See Figure 4 for a Site map with groundwater monitoring wells and groundwater analytical results. See Table 1 for monitoring well installation details and groundwater elevations. Tables 2 and 3 present soil and groundwater analytical results compared to applicable Cleanup Criteria.

SCOPE OF WORK FOR ADDITIONAL 2012 FIELD WORK

Based on results of the 2012 Phase III ESA and previous investigations, no applicable criterion was exceeded on Site. However, additional field work will be completed in 2012 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 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.

Prior to field work, Miss-Dig will be notified and a private locator will clear boring locations for underground utilities. Table 4 presents a summary of the proposed sampling and analysis for soil and groundwater. Figure 5 presents a Site map with the proposed soil boring and monitoring well locations.

The additional field work will follow 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. See Table 5 for the container, preservation, shipping and packing requirements. See Table 6 for a summary of analytical methods. See Table 7 for a parameter list.

The following AOIs will be investigated as part of the additional 2012 field work.

AOI 1 - Historical Operations - Former Plant 1

To assess potential off-Site impacts of VOCs northwest of MW72-08, up to four temporary monitoring wells pairs will be placed immediately off Site to the north and west within the southern right-of-way of Rapid Street and eastern right-of-way of Franklin Road directly down-gradient of MW72-08. If impacts are encountered in one or more of the temporary monitoring wells, CRA will install a permanent monitoring well pair in the right-of-way north of Rapid Street and west of MW81-12.

Up to eight groundwater samples will be collected from four temporary monitoring well pair locations. The shallow and intermediate temporary wells (well pairs) will be located approximately 5 feet apart horizontally. An intermediate temporary monitoring well will be installed to an approximate depth of 18 to 20 feet (ft) below ground surface (bgs) if saturated sands are encountered at this interval. Saturated sand/fill may be encountered at an approximate depth of 9 to12 ft bgs. A shallow temporary monitoring well will be installed if this unit is encountered. Shallow and/or intermediate temporary wells will only be installed if saturated sands are encountered. Groundwater will be sampled following low-flow procedures outlined in the SAP/QAP and analyzed for VOCs.

If unsaturated soil impacts are encountered during installation of temporary or permanent monitoring wells, a soil sample will be collected from the most impacted zone and up to two additional samples will be collected to vertically delineate the apparent impacts (to the extent possible).

AOI 2 - Historical Operations - Former Plants 3, 4 and 5

During the Phase III ESA, 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 will be installed approximately 150 ft east and one approximately 150 ft south of MW74-08 and samples will be collected and analyzed for VOCs. The well proposed approximately 150 ft south of MW74-08 will also serve to evaluate the eastern extent of impacts for AOIs 20 and 22 (See sections below). It is anticipated the monitoring wells will be screened across the water table from approximately 10 to 15 ft bgs.

The groundwater monitoring wells will be installed using hollow-stem auger drilling equipment and follow installation and sampling procedures outlined in the SAP/QAPP.

AOI 12-Bare Soil Area

Historically, SVOCs were detected above DCC, particulate soil inhalation criteria (PSIC) and volatile soil inhalation criteria (VSIC) in soil at TP-1 located north of Building 30. Investigation of soil impacts at TP-1 were conducted as part of the Phase III ESA and included the installation of five soil borings (BH98-12, BH99-12, BH100-12, BH101-12 and BH107-12). Fifteen soil samples (which included one duplicate) were collected from the five soil borings for analysis of SVOCs. Analytical results from the Phase III ESA identified SVOCs (benzo(a)pyrene (BAP), fluoranthene, naphthalene and phenanthrene) exceeding Residential DCC and/or GSI.

Based on SVOCs exceedances, additional soil samples will be collected to delineate the extent of impact. A hand auger will be utilized to collect soil samples from boring locations to the north, south, and west of BH101-12 and three step-out soil borings will be installed farther to the north, south and west.

Two soil samples will be collected from each soil boring (0 to 2 ft bgs and 3 to 4 ft bgs) to delineate SVOCs. Soil samples will be analyzed for PAHs. The PAH analysis provides results for the constituents (BAP, fluoranthene, naphthalene and phenanthrene) detected above DCC and/or GSI. Two soil samples will be collected from each step-out boring (0 to 2 ft bgs and 3 to 4 ft bgs) and put on hold pending analysis of the primary samples.

The PAH analysis will be completed in accordance with the SAP/QAPP. See Table 5 for the container, preservation, shipping and packing requirements. See Table 6 for a summary of analytical methods. See Table 7 for a parameter list.

AOI 20-Former Transformer Substations and Large Capacitors and AOI 22-Paint Mix Rooms

AOI 20 and AOI 22 were investigated together because they are located in the same area. Historically, PCBs were detected above DCC in the soil at BH72-08 at a depth of 12 to 14 ft bgs.

Investigation of soil impacts at BH72-08 were conducted as part of the Phase III ESA and included the installation of five soil borings (BH102-12, BH103-12, BH104-12, BH105-12 and BH106-12). Fifteen soil samples (which include one duplicate) were collected from the five soil borings for analysis of PCBs. In addition, four soil samples were collected from BH102-12, BH103-12, BH104-12 and BH105-12 from 12 to 14 ft bgs for additional analysis of VOCs and SVOCs.

Investigation of groundwater included one 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, field evidence of impacts and thickness of the water-bearing unit was greatest at MW88-12. A groundwater sample was collected from MW88-12 for analysis of metals, VOCs, SVOCs and PCBs.

Analytical results from the Phase III ESA indicate SVOCs (2-methylnapthalene and naphthalene) in soil and groundwater exceeded GSI. Groundwater impacts will be delineated to the east and south. The monitoring well to the east will also serve to evaluate the southern extent of VOC impacts from AOI 2.

Two groundwater monitoring wells will be installed using hollow-stem auger drilling equipment and follow installation and sampling procedures outlined in the SAP/QAPP. One groundwater monitoring well will be installed to the south of the former Paint Mix Rooms and one to the east of MW88-12. It is anticipated the monitoring wells will be screened across the water table approximately 10 to 15 ft bgs. Both groundwater samples will be analyzed for PAHs including 2-methylnapthalene and naphthalene. The groundwater sample collected from the monitoring well to the east will also be analyzed for VOCs.

As indicated in the section above, the PAH analysis will be completed in accordance with the SAP/QAPP. See Table 5 for the container, preservation, shipping and packing requirements. See Table 6 for a summary of analytical methods. See Table 7 for a parameter list.

AOI 28-LNAPL Plume

During the 2009 Phase II ESA, CRA encountered an 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. As part of the scope for the Phase III ESA, the EPA requested samples of LNAPL for chemical analysis; however, no samples were collected due to minimal LNAPL thickness (<0.01 ft) in monitoring wells MW69-08, MW84-12 and MW86-12. Therefore, two soil borings will be placed within the areas of greatest LNAPL thickness as identified in the LIF survey. The soil borings will be installed using a Geoprobe® drill rig and follow sampling procedures outlined in the SAP/QAPP. Upon identification of an LNAPL saturated interval, soil from up to two intervals per boring will be collected and analyzed for TCL VOCs, SVOCs, PCBs and metals.

Bail-down testing at monitoring wells MW69-08, MW84-12 and MW86-12will be conducted to calculate LNAPL transmissivity, if enough LNAPL is present; however, based on the minimal thickness of LNAPL measured to date, this will not likely be possible.

CONCLUSION

CRA conducted a Phase III ESA in August 2012at the PCC-Validation Site in Pontiac, Michigan (Site). In accordance with the approved SAP/QAPP, the purpose of the investigation was to address AOIs identified in the December 2011 Supplemental CCR.

Fourteen soil borings, eight groundwater monitoring wells and two LNAPL recovery wells were installed during the Phase III ESA to address eight AOIs. Analysis was conducted on 40 soil samples (including three duplicates), 16 groundwater samples (including one duplicate) and two soil cores.

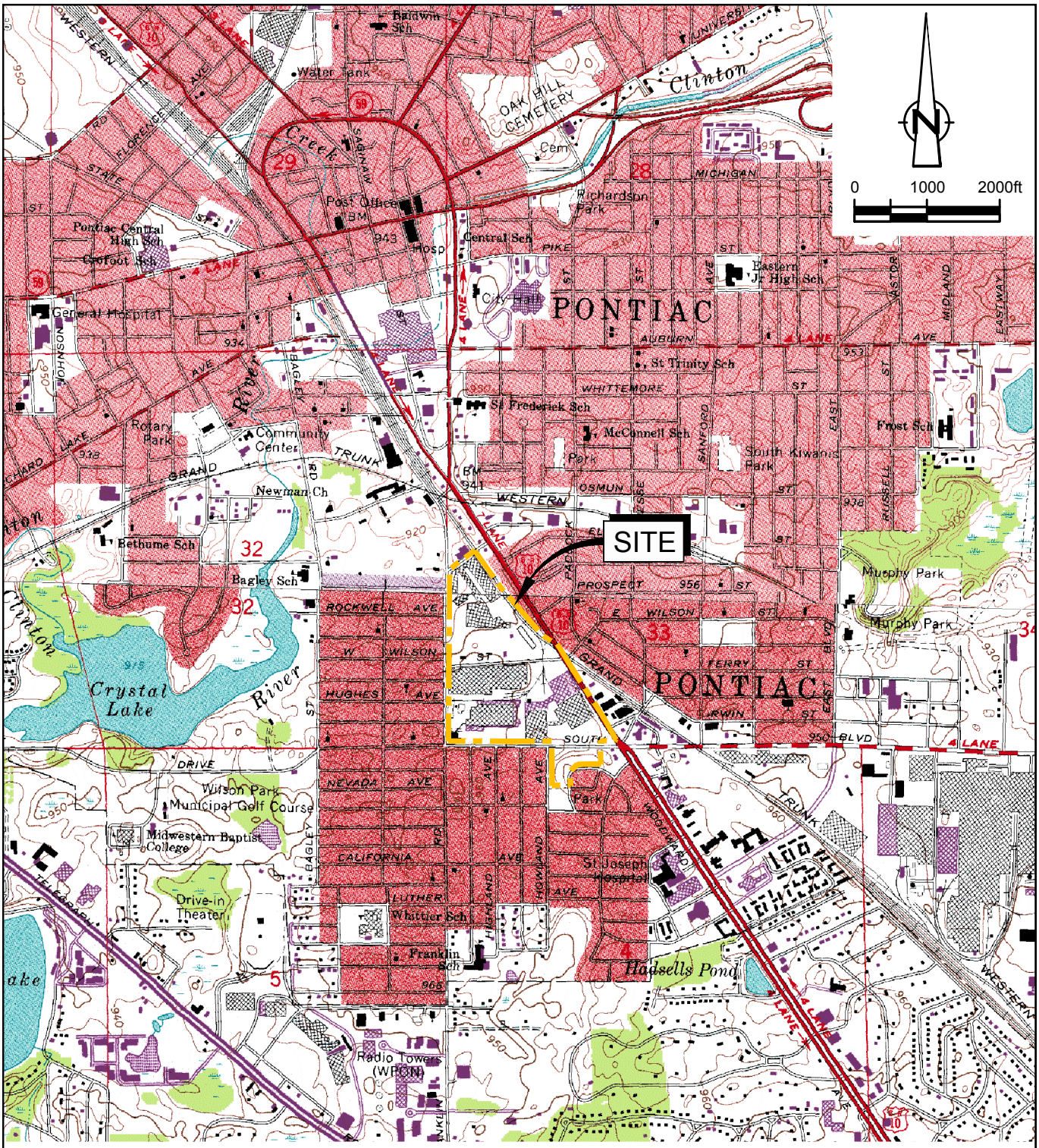
Analytical results from soil and groundwater samples were non-detect or below applicable Cleanup Criteria. However, based on review of the analytical results from the Phase III ESA, six of the eight AOIs need additional field work to delineate or further characterize impacts. The additional field work will consist of eight soil borings, four temporary monitoring well pairs (four shallow and four intermediate), three permanent monitoring wells, and one contingent permanent off-Site monitoring well pair. Soil and groundwater analysis will consist of the following:

- Up to eight groundwater samples from temporary monitoring wells will be collected for analysis of VOCs at AOI 1. If an exceedance of a Cleanup Criterion is encountered, a permanent off-Site monitoring well (or well pair) will be installed for analysis of VOCs.
- One groundwater sample from a permanent monitoring well for analysis of VOCs at AOI 2.
- Six soil samples will be collected for analysis of PAHs at AOI 12 (with the contingency of an additional six from step-out borings).
- One groundwater sample will be collected from a permanent monitoring well for analysis of PAHs (including 2-methylnapthalene and naphthalene) south of AOI 20/AOI 22.
- One groundwater sample will be collected from a permanent monitoring well for analysis of PAHs (including 2-methylnapthalene and naphthalene) and VOCs east of AOI 20/AOI 22 and south of AOI 2.
- Four LNAPL impacted soil samples will be collected for analysis of VOCs, SVOCs, PCBs and metals at AOI 28.

Methodology for all investigation activities and laboratory analyses will be consistent with the approved SAP/QAPP.

Upon approval from the EPA, the additional field work described above will be implemented. The field investigation is tentatively scheduled for the first week of December 2013.

FIGURES



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

LEGEND

APPROXIMATE SITE BOUNDARY

figure 1

SITE LOCATION MAP
PPC - VALIDATION
200 South Boulevard West, Pontiac, Michigan

017322-T01(MEMO016)GN-DE001 NOV 07/2012

Nº	Revision	Date	Initial

N

0 100 200ft

LEGEND

- BH-98-12 — COMPLETED SOIL BORING LOCATION BY CRA IN 2012
- MW-88-12 — 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
- APPROXIMATE SITE BOUNDARY
- EXISTING STRUCTURE
- FORMER SITE STRUCTURE
- M.H. — MANHOLE
- C.B. — CATCH BASIN

SCALE VERIFICATION

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

Approved

DRAWING STATUS

Status	Date	Initial

PCC - VALIDATION

SITE PLAN

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
T.K.	M.C.	NOVEMBER 2012	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
1:200	017322-T01	MEMO016	2

017322-T01(MEMO016)GN-DE002 NOV 08/2012

BH101-12	8/21/2012 0-2 ft BGS ug/kg	8/21/2012 9-11 ft BGS ug/kg	8/21/2012 13-15 ft BGS ug/kg
SVOCs			
Benzo(a)pyrene	5300 {p}	NE	NE
Fluoranthene	9400 {d}	NE	NE
Phenanthrene	4000 {d}	NE	NE

BH98-12	8/21/2012 0-2 ft BGS ug/kg	8/21/2012 9-11 ft BGS ug/kg	8/21/2012 13-15 ft BGS ug/kg
SVOCs			
SVOCs	NE	NE	NE

BH107-12	8/21/2012 9-11 ft BGS ug/kg	8/21/2012 13-15 ft BGS ug/kg
SVOCs		
Benzo(a)pyrene	4400 {p}	NE
Fluoranthene	10000 {d}	NE
Naphthalene	910 {d}	NE
Phenanthrene	9900 {d}	NE

BH99-12	8/21/2012 0-2 ft BGS ug/kg	8/21/2012 9-11 ft BGS ug/kg	8/21/2012 13-15 ft BGS ug/kg
SVOCs			
SVOCs	NE	NE	NE

BH100-12	8/21/2012 0-2 ft BGS ug/kg	8/21/2012 9-11 ft BGS ug/kg	8/21/2012 13-15 ft BGS ug/kg
SVOCs			
SVOCs	NE	NE	NE

MW85-12	8/23/2012 1-3 ft BGS ug/kg	8/23/2012 3-5 ft BGS ug/kg
Metals		
Silver	350 J{d}	NE
PCBs		
PCBs	NE	NE
SVOCs		
SVOCs	NE	NE
VOCs		
Tetrachloroethene	260 {b,c}	NE

MW79-12	8/21/2012 0-2 ft BGS ug/kg	8/21/2012 17-19 ft BGS ug/kg	8/21/2012 20-22 ft BGS ug/kg
PCBs			
PCBs	NE	NE	NE
VOCs			
VOCs	NE	NE	NE

MW87-12	8/23/2012 1-3 ft BGS ug/kg	8/23/2012 3-5 ft BGS ug/kg
Metals		
Metals	NE	NE
PCBs		
PCBs	NE	NE
SVOCs		
SVOCs	NE	NE
VOCs		
VOCs	NE	NE

BH102-12	8/20/2012 0-2 ft BGS ug/kg	8/20/2012 12-14 ft BGS ug/kg	8/20/2012 22-24 ft BGS ug/kg
PCBs			
PCBs	NE	NE	NE
SVOCs			
SVOCs	-	NE	-
VOCs			
VOCs	-	NE	-

BH103-12	8/20/2012 0-2 ft BGS ug/kg	8/20/2012 12-14 ft BGS ug/kg	8/20/2012 23-25 ft BGS ug/kg
PCBs			
PCBs	NE	NE	NE
SVOCs			
Naphthalene	-	860 {d}	-
VOCs			
VOCs	-	NE	-

BH105-12	8/20/2012 0-2 ft BGS ug/kg	8/20/2012 12-14 ft BGS ug/kg	8/20/2012 18-20 ft BGS ug/kg
PCBs			
PCBs	NE	NE	NE
SVOCs			
2-Methylnaphthalene	-	17000 {d}	-
Naphthalene	-	4100 {d}	-
VOCs			
VOCs	-	NE	-

BH97-12	8/21/2012 12-14 ft BGS ug/kg	8/21/2012 18-20 ft BGS ug/kg
PCBs		
PCBs	NE	NE
SVOCs		
SVOCs	NE	NE
VOCs		
VOCs	NE	NE

BH104-12	8/20/2012 0-2 ft BGS ug/kg	8/20/2012 12-14 ft BGS ug/kg	8/20/2012 22-24 ft BGS ug/kg
PCBs			
PCBs	NE	NE	NE
SVOCs			
SVOCs	-	NE	-
VOCs			
VOCs	-	NE	-

BH106-12	8/20/2012 15-17 ft BGS ug/kg	8/20/2012 18-20 ft BGS ug/kg
PCBs		
PCBs	NE	NE

	Units	Sandy (shallower) soils Selected Background Value	Clay (deeper) soils Selected Background Value	Residential Drinking Water Protection b	Non-Residential Drinking Water Protection c	Groundwater Surface Water Interface Protection d	Residential Direct Contact p	Non-Residential Direct Contact q
Metals								
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000	370000000
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000
Manganese	ug/kg	20900000	28300000	1000	1000	NA	25000000	90000000
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000
Silver	ug/kg	95	66.1	4500	13000	100	2500000	9000000
SVOCs								
Benzo(a)pyrene	ug/kg	NA	NA	NA	NA	NA	2000	8000
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000
VOCs								
Tetrachloroethene	ug/kg	NA	NA	100	100	1200	88000	88000

NA - Criteria not available or not applicable
NE - Results do not exceed MDEQ Part 201 Criteria
If results are below selected background level, all other citeria are not applicable
- Result exceeds applicable MDEQ Part 201 Criteria

NO	Revision	Date	Initial

LEGEND

- BH-98-12 COMPLETED SOIL BORING LOCATION BY CRA IN 2012
- MW-88-12 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
- APPROXIMATE SITE BOUNDARY
- EXISTING STRUCTURE
- FORMER SITE STRUCTURE
- M.H. MANHOLE
- C.B. CATCH BASIN

NOTES:
1. CLEANUP CRITERIA IDENTIFIED BY MDEQ RRD OP MEMO NO. 1 UPDATED 9/28/2012, PURSUANT TO 1994 CA 451 AS AMENED.

SCALE VERIFICATION

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

Approved

DRAWING STATUS

Status	Date	Initial

PCC - VALIDATION

SOIL ANALYTICAL RESULTS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: T.K.
Reviewed By: M.C.
Date: NOVEMBER 2012
Scale: 1:200
Project Nº: 017322-T01
Report Nº: MEMO016
Drawing Nº: 3

017322-T01(MEMO016)GN-DE003 NOV 08/2012

MW81-12	8/30/2012
	ug/L
Metals	
Aluminum	89 (a,b)
Iron	1600 (a,b)
Manganese	190 (a,b)
Selenium	7.4 (c)
Silver	0.3 J(c)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW2-07	8/28/2012
	ug/L
PCBs	
PCBs	NE
VOCs	
Trichloroethene	25 (a,b)

MW80-12	8/30/2012
	ug/L
Metals	
Iron	410 (a,b)
Manganese	150 (a,b)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW83-12	8/29/2012
	ug/L
Metals	
Aluminum	120 (a,b)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW82-12	8/30/2012
	ug/L
Metals	
Aluminum	22000 (a,b)
Arsenic	41 (a,b,c)
Chromium	34 (c)
Iron	32000 (a,b)
Lead	25 J(a,b)
Manganese	490 (a,b)
Mercury	0.073 J(c)
Selenium	12 J(c)
Vanadium	89 (a,b,c)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW87-12	8/30/2012
	ug/L
Metals	
Metals	NE
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW37-07	8/28/2012
	ug/L
SVOCs	
SVOCs	NE

MW88-12	8/29/2012
	ug/L
Metals	
Arsenic	12 (a,b,c)
Iron	2600 (a,b)
Manganese	93 (a,b)
PCBs	
PCBs	NE
SVOCs	
2-Methylnaphthalene	29 (c)
Naphthalene	24 (c)
VOCs	
VOCs	NE

MW74-08	8/28/2012
	ug/L
SVOCs	
SVOCs	NE
VOCs	
1,1,1-Trichloroethane	750 (a,b,c)
1,1-Dichloroethene	18 (a,b)
Trichloroethene	2100 (a,b,c)

MW79-12	8/29/2012
	ug/L
PCBs	
PCBs	NE
VOCs	
VOCs	NE

MW64-08	8/28/2012
	ug/L
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW63-08	8/28/2012
	ug/L
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW85-12	8/29/2012
	ug/L
Metals	
Aluminum	2300 (a,b)
Iron	2400 (a,b)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW84-12	8/30/2012
	ug/L
Metals	
Manganese	74 (a,b)/68 (a,b)
PCBs	
PCBs	NE
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

MW68-08	8/28/2012
	ug/L
SVOCs	
SVOCs	NE
VOCs	
VOCs	NE

	Units	Residential Drinking Water a	Non-Residential Drinking Water b	Groundwater Surface Water Interface c
Metals				
Aluminum	ug/L	50	50	NA
Arsenic	ug/L	10	10	10
Chromium	ug/L	100	100	11
Iron	ug/L	300	300	NA
Lead	ug/L	4	4	NA
Manganese	ug/L	50	50	NA
Mercury	ug/L	2	2	0.0013
Selenium	ug/L	50	50	5
Silver	ug/L	34	98	0.2
Vanadium	ug/L	4.5	62	27
SVOCs				
2-Methylnaphthalene	ug/L	260	750	19
Naphthalene	ug/L	520	1500	11
VOCs				
1,1,1-Trichloroethane	ug/L	200	200	89
1,1-Dichloroethene	ug/L	7	7	130
Trichloroethene	ug/L	5	5	200

NA - Criteria not available or not applicable
NE - Results do not exceed MDEQ Part 201 Criteria
- Result exceeds applicable MDEQ Part 201 Criteria

Nº	Revision	Date	Initial

N

0 100 200ft

LEGEND

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- 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
- APPROXIMATE SITE BOUNDARY
- EXISTING STRUCTURE
- FORMER SITE STRUCTURE
- M.H. — MANHOLE
- C.B. — CATCH BASIN

NOTES:

1. CLEANUP CRITERIA IDENTIFIED BY MDEQ RRD OP MEMO NO. 1 UPDATED 9/28/2012, PURSUANT TO 1994 CA 451 AS AMENED.

SCALE VERIFICATION

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

Approved

DRAWING STATUS

Status	Date	Initial

PCC - VALIDATION

GROUNDWATER ANALYTICAL RESULTS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
T.K.	M.C.	NOVEMBER 2012	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
1:200	017322-T01	MEMO016	4

017322-T01(MEMO016)GN-DE004 NOV 08/2012

Nº	Revision	Date	Initial

N

0 100 200ft

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 — PROPOSED SOIL BORING LOCATION
- MW90-12 — PROPOSED MONITORING WELL LOCATION
- APPROXIMATE SITE BOUNDARY
- EXISTING STRUCTURE
- FORMER SITE STRUCTURE
- M.H. — MANHOLE
- C.B. — CATCH BASIN

SCALE VERIFICATION

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

Approved

DRAWING STATUS

Status	Date	Initial

PCC - VALIDATION

PROPOSED SOIL BORING AND MONITORING WELL LOCATIONS

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager:	Reviewed By:	Date:	
T.K.	M.C.	NOVEMBER 2012	
Scale:	Project Nº:	Report Nº:	Drawing Nº:
1:200	017322-T01	MEMO016	5

017322-T01(MEMO016)GN-DE005 NOV 13/2012

TABLES

TABLE 1

BOREHOLE AND WELL COMPLETION DETAILS
PCC-VALIDATION
PONTIAC, MICHIGAN

Well ID	Date Installed	Ground Surface Elevation (ft AMSL)	Top of Riser Elevation (ft AMSL)	Total Depth of Soil Boring (ft bgs)	Screened Interval Top (ft bgs)	Screened Interval Bottom (ft bgs)	Screened Interval Top (ft AMSL)	Screened Interval Bottom (ft AMSL)
MW15-07	10/16/2007	960.77	960.42	30	9	14	951.77	946.77
MW17-07	10/16/2007	952.61	952.18	15	3	10	949.61	942.61
MW19-07	10/17/2007	959.94	959.68	30	8	13	951.94	946.94
MW21-07	12/4/2007	952.35	952.14	25	10.5	20.5	941.85	931.85
MW27-07	12/7/2007	946.92	946.51	25	3	13	943.92	933.92
MW28-07	10/18/2007	960.13	960.02	60	10	20	950.13	940.13
MW32-07	12/7/2007	953.64	953.40	25	9	19	944.64	934.64
MW33-07	12/4/2007	946.96	946.51	25	10.5	20.5	936.46	926.46
MW34-07	12/4/2007	951.24	950.88	20	11	16	940.24	935.24
MW35-07	12/4/2007	946.57	946.43	20	6	11	940.57	935.57
MW37-07	12/4/2007	947.16	946.85	30	12.5	25.5	934.66	921.66
MW38-07	12/4/2007	949.46	949.21	20	9.5	14.5	939.96	934.96
MW40-07	12/6/2007	948.73	948.42	20	11	16	937.73	932.73
MW43-07	12/6/2007	950.05	949.74	20	7	15	943.05	935.05
MW46-07 (1)	10/9/2007	--	--	15.5	5	15	--	--
MW48-07	10/9/2007	960.99	960.69	20	5	15	955.99	945.99
MW2-07	10/12/2007	936.97	936.95	30	12	25	924.97	911.97
MW4-07	10/11/2007	938.13	937.77	20	5.5	15.5	932.63	922.63
MW7-07	10/12/2007	938.04	937.67	38	10	15	928.04	923.04
MW10-07	10/15/2007	941.44	941.11	15	3.5	13.5	937.94	927.94
MW11-07	10/16/2007	954.67	954.27	40	7	12	947.67	942.67
MW13-07	10/18/2007	953.13	956.11	20	7	14	946.13	939.13
MW16-07	10/18/2007	956.08	955.89	60	6	16	950.08	940.08
MW20-07	10/17/2007	960.26	960.06	20	6.5	13	953.76	947.26
MW63-08	3/10/2008	947.78	947.39	20	9.5	15.5	938.28	932.28
MW64-08	3/10/2008	947.78	947.52	30	9.5	14.5	938.28	933.28
MW68-08	3/12/2008	956.94	956.58	25	9	19	947.94	937.94
MW69-08	3/13/2008	956.91	956.49	25	10	20	946.91	936.91
TMW70-08	3/5/2008	945.52	947.55	15	3	8	942.52	937.52
TMW71-08	3/6/2008	947.00	949.06	15	3	8	944.00	939.00
MW74-08	3/14/2008	956.96	956.76	20	8	16	948.96	940.96
MW78-08	3/11/2008	964.11	964.00	20	8	13	956.11	951.11
TMW80-08	3/5/2008	954.17	955.31	15	4	9	950.17	945.17
TMW81-08	3/5/2008	954.18	957.17	15	2	7	952.18	947.18
TMW87-08	3/6/2008	949.66	951.96	15	6	11	943.66	938.66
MW79-12	8/22/2012	936.77	936.45	40	25	30	911.45	906.45
MW80-12	8/28/2012	930.14	929.72	15	7	12	923.14	918.14
MW81-12	8/28/2012	932.16	931.54	25	14	19	918.16	913.16
MW82-12	8/23/2012	946.83	946.53	10	2.5	7.5	944.33	939.33
MW83-12	8/23/2012	951.98	951.74	15	6	11	945.98	940.98
MW84-12	8/28/2012	956.12	955.86	20	5	20	951.12	936.12
MW85-12	8/23/2012	947.69	947.13	15	5	10	942.69	937.69
MW86-12	8/24/2012	956.82	956.56	20	8	18	948.82	938.82
MW87-12	8/23/2012	946.14	945.70	15	4	9	942.14	937.14
MW88-12	8/20/2012	956.88	956.29	20.5	15.5	20.5	941.38	936.38

Notes:

(1) Monitoring well MW46-07 could not be located for surveying due to demolition debris over the well.
ft AMSL - Feet Above Mean Sea Level.
ft bgs - Feet below ground surface.
MW - Monitoring well.
TMW - Temporary monitoring well.

TABLE 2

SOIL ANALYTICAL RESULTS
AUGUST 2012
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)					BH97-12	BH97-12	BH98-12	BH98-12	BH98-12	BH99-12
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	12-14 ft BGS	18-20 ft BGS	0-2 ft BGS	9-11 ft BGS	13-15 ft BGS	0-2 ft BGS
Sample ID:		Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact						
Sample Date:		Value(2)	Value(2)	Protection	Protection	Interface Protection			08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/21/2012
Sample Type:														
Parameters	**Units**	**a**	**a**	**b**	**c**	**d**	**p**	**q**						
VOCs														
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	230 U	230 U	--	--	--	--
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	35 U	35 U	--	--	--	--
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	5900000 C	35 U	35 U	--	--	--	--
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	2300000 C	35 U	35 U	--	--	--	--
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	520000 C	35 U	35 U	--	--	--	--
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	88000 C	35 U	35 U	--	--	--	--
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	250000 C	35 U	35 U	--	--	--	--
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	1400000 C	35 U	35 U	--	--	--	--
SVOCs														
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	180 U	1700 U	180 U	170 U	1700 U
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000		23000000	73000000	180 U	180 U	1700 U	180 U	170 U	1700 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	3300000	180 U	180 U	1700 U	180 U	170 U	1700 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	1800000 C,DD	180 U	180 U	1700 U	180 U	170 U	1700 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	36000000	380 U	380 U	3500 U	380 U	350 U	3400 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	750 U	750 U	7100 U	760 U	700 U	6800 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	48000	220000	180 U	180 U	1700 U	180 U	170 U	1700 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	180 U	1700 U	180 U	170 U	1700 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	56000000	180000000	91 U	91 U	860 U	92 U	85 U	830 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	1400000	4500000	180 U	180 U	1700 U	180 U	170 U	1700 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	87 J	33 J	460 J	92 U	85 U	830 U
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	180 U	180 U	1700 U	180 U	170 U	1700 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA		750 U	750 U	7100 U	760 U	700 U	6800 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	34 U	34 U	320 U	35 U	32 U	310 U
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	380 U	380 U	3500 U	380 U	350 U	3400 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	380 U	380 U	3500 U	380 U	350 U	3400 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	34 U	24 J	870	35 U	32 U	590
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	34 U	34 U	880	35 U	32 U	700
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	34 U	34 U	950	35 U	32 U	880
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	34 U	34 U	580	35 U	32 U	420
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	34 U	34 U	680	35 U	32 U	660
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	380 U	380 U	3500 U	380 U	350 U	3400 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	380 U	380 U	3500 U	380 U	350 U	3400 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	380 U	380 U	3500 U	380 U	350 U	3400 U
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	180 U	180 U	1700 U	180 U	170 U	1700 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	34 U	34 U	1700	35 U	32 U	1500
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	34 U	34 U	320 U	35 U	32 U	310 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	180 U	180 U	1700 U	180 U	170 U	1700 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	100000	350000 C	180 U	180 U	1700 U	180 U	170 U	1700 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	720000 C	720000 C	380 U	380 U	3500 U	380 U	350 U	3400 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	180 U	180 U	1700 U	180 U	170 U	1700 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	34 U	34 U	570	35 U	32 U	410
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	180 U	180 U	1700 U	180 U	170 U	1700 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	19 J	34 U	290 J	35 U	32 U	310 U
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	180 U	180 U	1700 U	180 U	170 U	1700 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	180 U	180 U	1700 U	180 U	170 U	1700 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	180 U	180 U	1700 U	180 U	170 U	1700 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	380 U	380 U	3500 U	380 U	350 U	3400 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	34 U	34 U	900	35 U	32 U	650
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	12000000 C,DD	180 U	180 U	1700 U	180 U	170 U	1700 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	34 U	34 U	1300	35 U	32 U	1000
Metals														
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	370000000 DD	--	--	--	--	--	--
Antimony	ug/kg	80j	160J	4300	4300	94000 X	180000	670000	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	--	--	--	--	--	--
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	--	--	--	--	--	--
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	--	--	--	--	--	--
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	--	--	--	--	--	--
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000	--	--	--	--	--	--
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	--	--	--	--	--	--
Manganese	ug/kg	677000	4560000	1000	1000	G, X	25000000	90000000	--	--	--	--	--	--
Mercury	ug/kg	54.1	52U	1700	1700	50 M	160000	580000	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	--	--	--	--	--	--
Silver	ug/kg	95UJ	66.1	4500	13000	100 M	2500000	9000000	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	--	--	--	--	--	--
PCBs														
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	44 U	43 U	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	44 U	43 U	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	44 U	43 U	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	44 U	43 U	--	--	--	--

Notes:
If results are below select background level, all other citeria 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
- Indicates concentration exceeded Part 201 Cleanup Criteria
- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 2

SOIL ANALYTICAL RESULTS
AUGUST 2012
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)					BH99-12	BH99-12	BH100-12	BH100-12	BH100-12	BH100-12	BH101-12	BH101-12
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	9-11 ft BGS	13-15 ft BGS	0-2 ft BGS	9-11 ft BGS	13-15 ft BGS	13-15 ft BGS	0-2 ft BGS	9-11 ft BGS
Sample ID:		Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact								
Sample Date:		Value(2)	Value(2)	Protection	Protection	Interface Protection			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		
Parameters	Units	a	a	b	c	d	p	q								
VOCs																
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	--	--	--	--	--	--
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	5900000 C	--	--	--	--	--	--	--	--
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	2300000 C	--	--	--	--	--	--	--	--
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	520000 C	--	--	--	--	--	--	--	--
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	88000 C	--	--	--	--	--	--	--	--
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	250000 C	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	1400000 C	--	--	--	--	--	--	--	--
SVOCs																
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg	NA	NA	NA	NA	NA	NA	NA	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000		23000000	73000000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	3300000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	1800000 C,DD	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	36000000	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	7700 U	710 U	670 U	780 U	760 U	770 U	6900 U	690 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	48000	220000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	56000000	180000000	940 U	86 U	82 U	95 U	92 U	94 U	830 U	83 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	1400000	4500000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	940 U	86 U	82 U	95 U	92 U	94 U	210 J	83 U
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA		7700 U	710 U	670 U	780 U	760 U	770 U	6900 U	690 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	350 U	32 U	31 U	36 U	34 U	35 U	990	31 U
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	220 J	32 U	31 U	36 U	34 U	35 U	5000	31 U
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	300 J	32 U	31 U	36 U	34 U	35 U	**5300 P**	31 U
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	340 J	32 U	31 U	36 U	34 U	35 U	6500	31 U
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	350 U	32 U	31 U	36 U	34 U	35 U	2600	31 U
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	310 J	32 U	31 U	36 U	34 U	35 U	2600	31 U
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	520	32 U	31 U	20 J	34 U	35 U	**9400 P**	31 U
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	350 U	32 U	31 U	36 U	34 U	35 U	240 J	31 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	100000	350000 C	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	720000 C	720000 C	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	350 U	32 U	31 U	36 U	34 U	35 U	2700	31 U
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	350 U	32 U	31 U	36 U	34 U	35 U	310 U	31 U
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	3900 U	350 U	340 U	390 U	380 U	390 U	3400 U	340 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	350 U	32 U	31 U	36 U	34 U	35 U	**4000 P**	31 U
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	12000000 C,DD	1900 U	170 U	160 U	190 U	180 U	190 U	1700 U	170 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	380	32 U	31 U	36 U	34 U	35 U	7600	31 U
Metals																
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	370000000 DD	--	--	--	--	--	--	--	--
Antimony	ug/kg	80j	160J	4300	4300	94000 X	180000	670000	--	--	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	--	--	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	--	--	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	--	--	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	--	--	--	--	--	--	--	--
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	--	--	--	--	--	--	--	--
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	--	--	--	--	--	--	--	--
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	--	--	--	--	--	--	--	--
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000	--	--	--	--	--	--	--	--
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	--	--	--	--	--	--	--	--
Manganese	ug/kg	677000	4560000	1000	1000	G, X	25000000	90000000	--	--	--	--	--	--	--	--
Mercury	ug/kg	54.1	52U	1700	1700	50 M	160000	580000	--	--	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	--	--	--	--	--	--	--	--
Silver	ug/kg	95UJ	66.1	4500	13000	100 M	2500000	9000000	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	--	--	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	--	--	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	--	--	--	--	--	--	--	--
PCBs																
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	--	--	--	--	--	--	--
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	--	--	--	--	--	--	--
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	--	--	--	--	--	--	--
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	--	--	--	--	--	--	--

Notes:
If results are below select background level, all other citeria 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
- Indicates concentration exceeded Part 201 Cleanup Criteria
- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 2

SOIL ANALYTICAL RESULTS
AUGUST 2012
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]					BH101-12	BH102-12	BH102-12	BH102-12	BH103-12	BH103-12	BH103-12	BH104-12
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	13-15 ft BGS	0-2 ft BGS	12-14 ft BGS	22-24 ft BGS	0-2 ft BGS	12-14 ft BGS	23-25 ft BGS	0-2 ft BGS
Sample ID:		Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact								
Sample Date:		Value(2)	Value(2)	Protection	Protection	Interface Protection			08/21/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012
Sample Type:																
Parameters	**Units**	**a**	**a**	**b**	**c**	**d**	**p**	**q**								
VOCs																
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	220 U	--	--	230 U	--	--
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	--	34 U	--	--	34 U	--	--
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	5900000 C	--	--	34 U	--	--	34 U	--	--
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	2300000 C	--	--	34 U	--	--	34 U	--	--
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	520000 C	--	--	34 U	--	--	34 U	--	--
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	88000 C	--	--	34 U	--	--	34 U	--	--
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	250000 C	--	--	34 U	--	--	34 U	--	--
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	1400000 C	--	--	34 U	--	--	34 U	--	--
SVOCs																
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	--	180 U	--	--	180 U	--	--
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000		23000000	73000000	180 U	--	180 U	--	--	180 U	--	--
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	3300000	180 U	--	180 U	--	--	180 U	--	--
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	1800000 C,DD	180 U	--	180 U	--	--	180 U	--	--
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	36000000	360 U	--	370 U	--	--	370 U	--	--
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	720 U	--	740 U	--	--	740 U	--	--
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	48000	220000	180 U	--	180 U	--	--	180 U	--	--
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	--	180 U	--	--	180 U	--	--
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	56000000	180000000	88 U	--	90 U	--	--	89 U	--	--
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	1400000	4500000	180 U	--	180 U	--	--	180 U	--	--
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	88 U	--	910	--	--	3400	--	--
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	180 U	--	180 U	--	--	180 U	--	--
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA		720 U	--	740 U	--	--	740 U	--	--
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	33 U	--	34 U	--	--	34 U	--	--
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	360 U	--	370 U	--	--	370 U	--	--
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	360 U	--	370 U	--	--	370 U	--	--
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	28 J	--	--	45	--	--
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	33 U	--	34 U	--	--	34 U	--	--
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	34 U	--	--	34 U	--	--
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	33 U	--	34 U	--	--	34 U	--	--
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	33 U	--	34 U	--	--	34 U	--	--
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	360 U	--	370 U	--	--	370 U	--	--
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	360 U	--	370 U	--	--	370 U	--	--
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	360 U	--	370 U	--	--	370 U	--	--
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	180 U	--	180 U	--	--	180 U	--	--
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	33 U	--	34 U	--	--	34 U	--	--
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	33 U	--	41	--	--	75	--	--
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	180 U	--	180 U	--	--	180 U	--	--
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	100000	350000 C	180 U	--	180 U	--	--	180 U	--	--
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	720000 C	720000 C	360 U	--	370 U	--	--	370 U	--	--
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	180 U	--	180 U	--	--	180 U	--	--
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	34 U	--	--	34 U	--	--
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	180 U	--	180 U	--	--	180 U	--	--
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	33 U	--	310	--	--	**860 [d]**	--	--
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	180 U	--	180 U	--	--	180 U	--	--
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	180 U	--	180 U	--	--	180 U	--	--
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	180 U	--	180 U	--	--	180 U	--	--
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	360 U	--	370 U	--	--	370 U	--	--
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	33 U	--	64	--	--	96	--	--
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	12000000 C,DD	180 U	--	180 U	--	--	180 U	--	--
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	33 U	--	34 U	--	--	20 J	--	--
Metals																
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	370000000 DD	--	--	--	--	--	--	--	--
Antimony	ug/kg	80j	160J	4300	4300	94000 X	180000	670000	--	--	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	--	--	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	--	--	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	--	--	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	--	--	--	--	--	--	--	--
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	--	--	--	--	--	--	--	--
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	--	--	--	--	--	--	--	--
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	--	--	--	--	--	--	--	--
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000	--	--	--	--	--	--	--	--
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	--	--	--	--	--	--	--	--
Manganese	ug/kg	677000	4560000	1000	1000	G, X	25000000	90000000	--	--	--	--	--	--	--	--
Mercury	ug/kg	54.1	52U	1700	1700	50 M	160000	580000	--	--	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	--	--	--	--	--	--	--	--
Silver	ug/kg	95UJ	66.1	4500	13000	100 M	2500000	9000000	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	--	--	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	--	--	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	--	--	--	--	--	--	--	--
PCBs																
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	51 U	43 U	47 U	44 U	44 U	47 U	42 U
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	51 U	43 U	47 U	44 U	44 U	47 U	42 U
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	51 U	43 U	47 U	40 J	44 U	47 U	42 U
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	51 U	43 U	47 U	44 U	44 U	47 U	42 U

Notes:
If results are below select background level, all other citeria 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
- Indicates concentration exceeded Part 201 Cleanup Criteria
- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 2

SOIL ANALYTICAL RESULTS
AUGUST 2012
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)												
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	BH104-12	BH104-12	BH105-12	BH105-12	BH105-12	BH105-12	BH106-12	BH106-12	BH107-12
Sample ID:		Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact	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	9-11 ft BGS
Sample Date:		Value(2)	Value(2)	Protection	Protection	Interface Protection			08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/20/2012	08/21/2012
Sample Type:														Duplicate			
Parameters	Units	a	a	b	c	d	p	q									
VOCs																	
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	230 U	--	--	230 U	--	--	--	--	--
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	35 U	--	--	34 U	--	--	--	--	--
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	5900000 C	35 U	--	--	34 U	--	--	--	--	--
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	2300000 C	35 U	--	--	34 U	--	--	--	--	--
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	520000 C	35 U	--	--	34 U	--	--	--	--	--
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	88000 C	35 U	--	--	34 U	--	--	--	--	--
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	250000 C	35 U	--	--	34 U	--	--	--	--	--
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	1400000 C	35 U	--	--	34 U	--	--	--	--	--
SVOCs																	
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg	NA	NA	NA	NA	NA	NA	NA	170 U	--	--	180 U	--	--	--	--	1700 U
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000		23000000	73000000	170 U	--	--	180 U	--	--	--	--	1700 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	3300000	170 U	--	--	180 U	--	--	--	--	1700 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	1800000 C,DD	170 U	--	--	180 U	--	--	--	--	1700 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	36000000	48 J	--	--	370 U	--	--	--	--	3600 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	720 U	--	--	740 U	--	--	--	--	7100 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	48000	220000	170 U	--	--	180 U	--	--	--	--	1700 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	170 U	--	--	180 U	--	--	--	--	1700 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	56000000	180000000	87 U	--	--	90 U	--	--	--	--	870 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	1400000	4500000	170 U	--	--	180 U	--	--	--	--	1700 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	87 U	--	--	**17000** [d]	--	--	--	--	690 J
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	170 U	--	--	180 U	--	--	--	--	1700 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA		48 J	--	--	740 U	--	--	--	--	7100 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	33 U	--	--	64	--	--	--	--	2000
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	360 U	--	--	370 U	--	--	--	--	3600 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	360 U	--	--	370 U	--	--	--	--	3600 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	28 J	--	--	340 U	--	--	--	--	4400
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	33 U	--	--	340 U	--	--	--	--	**4400** [p]
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	--	340 U	--	--	--	--	4600
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	33 U	--	--	340 U	--	--	--	--	1600
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	33 U	--	--	340 U	--	--	--	--	4300
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	360 U	--	--	370 U	--	--	--	--	3600 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	360 U	--	--	370 U	--	--	--	--	3600 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	360 U	--	--	370 U	--	--	--	--	180 J
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	170 U	--	--	1800 U	--	--	--	--	1700 U
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	33 U	--	--	60	--	--	--	--	**10000** [d]
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	21 J	--	--	34 U	--	--	--	--	1600
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	170 U	--	--	180 U	--	--	--	--	1700 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	100000	350000 C	170 U	--	--	180 U	--	--	--	--	1700 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	720000 C	720000 C	360 U	--	--	370 U	--	--	--	--	3600 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	170 U	--	--	180 U	--	--	--	--	1700 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	--	340 U	--	--	--	--	1700
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	170 U	--	--	180 U	--	--	--	--	1700 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	33 U	--	--	**4100** [d]	--	--	--	--	**910** [d]
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	170 U	--	--	180 U	--	--	--	--	1700 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	170 U	--	--	180 U	--	--	--	--	1700 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	170 U	--	--	180 U	--	--	--	--	1700 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	360 U	--	--	370 U	--	--	--	--	3600 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	35	--	--	560	--	--	--	--	**9900** [d]
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	12000000 C,DD	170 U	--	--	180 U	--	--	--	--	1700 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	33 U	--	--	620	--	--	--	--	9100
Metals																	
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	370000000 DD	--	--	--	--	--	--	--	--	--
Antimony	ug/kg	80j	160J	4300	4300	94000 X	180000	670000	--	--	--	--	--	--	--	--	--
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	--	--	--	--	--	--	--	--	--
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	--	--	--	--	--	--	--	--	--
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	--	--	--	--	--	--	--	--	--
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	--	--	--	--	--	--	--	--	--
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	--	--	--	--	--	--	--	--	--
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	--	--	--	--	--	--	--	--	--
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	--	--	--	--	--	--	--	--	--
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000	--	--	--	--	--	--	--	--	--
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	--	--	--	--	--	--	--	--	--
Manganese	ug/kg	677000	4560000	1000	1000	G, X	25000000	90000000	--	--	--	--	--	--	--	--	--
Mercury	ug/kg	54.1	52U	1700	1700	50 M	160000	580000	--	--	--	--	--	--	--	--	--
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	--	--	--	--	--	--	--	--	--
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	--	--	--	--	--	--	--	--	--
Silver	ug/kg	95UJ	66.1	4500	13000	100 M	2500000	9000000	--	--	--	--	--	--	--	--	--
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	--	--	--	--	--	--	--	--	--
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	--	--	--	--	--	--	--	--	--
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	--	--	--	--	--	--	--	--	--
PCBs																	
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	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	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	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	46 U	48 U	44 U	45 U	43 U	42 U	43 U	44 U	--

Notes:
If results are below select background level, all other citeria 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
- Indicates concentration exceeded Part 201 Cleanup Criteria
- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 2

SOIL ANALYTICAL RESULTS
AUGUST 2012
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)					BH107-12	MW79-12	MW79-12	MW79-12	MW85-12	MW85-12	MW87-12	MW87-12	MW87-12
Sample Depth:		Selected	Selected	Residential	Non-Residential	Groundwater	Residential	Non-Residential	13-15 ft BGS	0-2 ft BGS	17-19 ft BGS	20-22 ft BGS	1-3 ft BGS	3-5 ft BGS	1-3 ft BGS	1-3 ft BGS	3-5 ft BGS
Sample ID:		Background	Background	Drinking Water	Drinking Water	Surface Water	Direct Contact	Direct Contact									
Sample Date:		Value(2)	Value(2)	Protection	Protection	Interface Protection			08/21/2012	08/21/2012	08/21/2012	08/21/2012	08/23/2012	08/23/2012	08/23/2012	08/23/2012	08/23/2012
Sample Type:																Duplicate	
Parameters	**Units**	**a**	**a**	**b**	**c**	**d**	**p**	**q**									
VOCs																	
Methyl acetate	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	220 U	220 U	220 U	240 U	220 U	230 U	220 U	220 U
Methyl cyclohexane	ug/kg	NA	NA	NA	NA	NA	NA	NA	--	33 U	34 U	33 U	36 U	33 U	34 U	34 U	33 U
Methyl tert butyl ether (MTBE)	ug/kg	NA	NA	800	800	140000 X	1500000	5900000 C	--	33 U	34 U	33 U	36 U	33 U	34 U	34 U	33 U
Methylene chloride	ug/kg	NA	NA	100	100	30000 X	1300000	2300000 C	--	33 U	47	33 U	36 U	33 U	34 U	34 U	33 U
Styrene	ug/kg	NA	NA	2700	2700	2100 X	400000	520000 C	--	33 U	34 U	33 U	36 U	33 U	34 U	34 U	33 U
Tetrachloroethene	ug/kg	NA	NA	100	100	1200 X	88000 C	88000 C	--	33 U	34 U	33 U	**260** [bc]	33 U	34 U	34 U	33 U
Toluene	ug/kg	NA	NA	16000	16000	5400	250000 C	250000 C	--	33 U	34 U	33 U	36 U	33 U	34 U	34 U	33 U
trans-1,2-Dichloroethene	ug/kg	NA	NA	2000	2000	30000 X	1400000 C	1400000 C	--	33 U	34 U	33 U	36 U	33 U	34 U	34 U	33 U
SVOCs																	
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2,4,5-Trichlorophenol	ug/kg	NA	NA	39000	110000		23000000	73000000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2,4,6-Trichlorophenol	ug/kg	NA	NA	2400	9400	330 M	710000	3300000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2,4-Dichlorophenol	ug/kg	NA	NA	1500	4200	330 M	660000 DD	1800000 C,DD	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2,4-Dimethylphenol	ug/kg	NA	NA	7400	20000	7600	11000000	36000000	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
2,4-Dinitrophenol	ug/kg	NA	NA	NA	NA	NA	NA	NA	720 U	--	--	--	730 U	710 U	720 U	730 U	720 U
2,4-Dinitrotoluene	ug/kg	NA	NA	430	640	NA	48000	220000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2,6-Dinitrotoluene	ug/kg	NA	NA	NA	NA	NA	NA	NA	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2-Chloronaphthalene	ug/kg	NA	NA	620000	1800000	NA	56000000	180000000	88 U	--	--	--	88 U	86 U	88 U	89 U	88 U
2-Chlorophenol	ug/kg	NA	NA	900	2600	360	1400000	4500000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2-Methylnaphthalene	ug/kg	NA	NA	57000	170000	4200	8100000	26000000	88 U	--	--	--	20 J	86 U	88 U	40 J	88 U
2-Methylphenol	ug/kg	NA	NA	7400	20000	1000 M	11000000	36000000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
2-Nitroaniline	ug/kg	NA	NA	NA	NA	NA	NA		720 U	--	--	--	730 U	710 U	720 U	730 U	720 U
Anthracene	ug/kg	NA	NA	41000	41000	ID	230000000	730000000	33 U	--	--	--	33 U	32 U	33 U	33 U	33 U
Atrazine	ug/kg	NA	NA	60	60	150	71000 DD	330000 DD	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Benzaldehyde	ug/kg	NA	NA	NA	NA	NA	NA	NA	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Benzo(a)anthracene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	--	--	22 J	32 U	33 U	33 U	33 U
Benzo(a)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	2000	8000	33 U	--	--	--	24 J	32 U	33 U	33 U	33 U
Benzo(b)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	--	--	41	32 U	33 U	33 U	33 U
Benzo(g,h,i)perylene	ug/kg	NA	NA	NLL	NLL	NLL	2500000	7000000	33 U	--	--	--	33 U	32 U	33 U	33 U	33 U
Benzo(k)fluoranthene	ug/kg	NA	NA	NLL	NLL	NLL	200000	800000	33 U	--	--	--	44	32 U	33 U	33 U	33 U
Diethyl phthalate	ug/kg	NA	NA	110000	320000	2200	740000 C	740000 C	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Dimethyl phthalate	ug/kg	NA	NA	790000 C	790000 C	NA	790000 C	790000 C	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Di-n-butylphthalate (DBP)	ug/kg	NA	NA	760000 C	760000 C	11000	760000 C	760000 C	360 U	--	--	--	39 J	34 J	33 J	34 J	33 J
Di-n-octyl phthalate (DnOP)	ug/kg	NA	NA	100000000	140000000 C	ID	6900000	20000000	180 U	--	--	--	180 U	170 U	32 J	180 U	32 J
Fluoranthene	ug/kg	NA	NA	730000	730000	5500	46000000	130000000	33 U	--	--	--	33 U	32 U	33 U	33 U	33 U
Fluorene	ug/kg	NA	NA	390000	890000	5300	27000000	87000000	33 U	--	--	--	33 U	32 U	33 U	33 U	33 U
Hexachlorobenzene	ug/kg	NA	NA	1800	1800	350	8900	37000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Hexachlorobutadiene	ug/kg	NA	NA	26000	72000	91	100000	350000 C	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Hexachlorocyclopentadiene	ug/kg	NA	NA	320000	320000	ID	720000 C	720000 C	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Hexachloroethane	ug/kg	NA	NA	430	1200	1800 X	230000	730000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Indeno(1,2,3-cd)pyrene	ug/kg	NA	NA	NLL	NLL	NLL	20000	80000	33 U	--	--	--	24 J	32 U	33 U	33 U	33 U
Isophorone	ug/kg	NA	NA	15000	62000	26000 X	2400000 C	2400000 C	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Naphthalene	ug/kg	NA	NA	35000	100000	730	16000000	52000000	33 U	--	--	--	33 U	32 U	33 U	33 U	33 U
Nitrobenzene	ug/kg	NA	NA	330 M	330 M	3600 X	100000	340000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
N-Nitrosodi-n-propylamine	ug/kg	NA	NA	330 M	330 M	NA	1200	5400	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
N-Nitrosodiphenylamine	ug/kg	NA	NA	5400	22000	NA	1700000	7800000	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Pentachlorophenol	ug/kg	NA	NA	22	22	G, X	90000	320000	360 U	--	--	--	360 U	350 U	360 U	370 U	360 U
Phenanthrene	ug/kg	NA	NA	56000	160000	2100	1600000	5200000	33 U	--	--	--	35	32 U	33 U	33 U	33 U
Phenol	ug/kg	NA	NA	88000	260000	9000	12000000 C,DD	12000000 C,DD	180 U	--	--	--	180 U	170 U	180 U	180 U	180 U
Pyrene	ug/kg	NA	NA	480000	480000	ID	29000000	84000000	33 U	--	--	--	32 J	32 U	33 U	33 U	33 U
Metals																	
Aluminum	ug/kg	10800000	12000000	1000	1000	NA	50000000 DD	370000000 DD	--	--	--	--	4200000	2700000	6100000	6700000	4400000
Antimony	ug/kg	8Bj	16Bj	4300	4300	94000 X	180000	670000	--	--	--	--	170 J	110 J	120 J	130 J	140 J
Arsenic	ug/kg	7020	9610	4600	4600	4600	7600	37000	--	--	--	--	2700	2900	4200	3500	3800
Barium	ug/kg	240000	79700	1300000	1300000	G	37000000	130000000	--	--	--	--	19000	17000	46000	57000	31000
Beryllium	ug/kg	584	600	51000	51000	G	410000	1600000	--	--	--	--	160 J	170 J	400 J	400 J	270 J
Cadmium	ug/kg	549	673	6000	6000	G,X	550000	2100000	--	--	--	--	150 J	120 J	110 J	130 J	120 J
Chromium	ug/kg	18700	20200	30000	30000	3300	2500000	9200000	--	--	--	--	5500	5700	12000	12000	9200
Cobalt	ug/kg	11600	14900	800	2000	2000	2600000	9000000	--	--	--	--	5300	3400	6200	6400	5000
Copper	ug/kg	20600	24300	5800000	5800000	G	20000000	73000000	--	--	--	--	12000	9500	12000	12000	15000
Iron	ug/kg	24400000	22000000	6000	6000	NA	160000000	580000000	--	--	--	--	6700000	7800000	14000000	14000000	11000000
Lead	ug/kg	18200	27600	700000	700000	G, X	400000	900000 DD	--	--	--	--	7200	5400	7000	7300	10000
Manganese	ug/kg	677000	4560000	1000	1000	G, X	25000000	90000000	--	--	--	--	200000	380000	460000	480000	360000
Mercury	ug/kg	54.1	52U	1700	1700	50 M	160000	580000	--	--	--	--	41	14 J	13 J	15 J	14 J
Nickel	ug/kg	20000	31300	100000	100000	G	40000000	150000000	--	--	--	--	6100	8900	16000	15000	11000
Selenium	ug/kg	922	803	4000	4000	400	2600000	9600000	--	--	--	--	220 J	300 J	430	340 J	610
Silver	ug/kg	95UJ	66.1	4500	13000	100 M	2500000	9000000	--	--	--	--	**350 J** [d]	11 J	18 J	15 J	18 J
Thallium	ug/kg	190	432	2300	2300	4200 X	35000	130000	--	--	--	--	88 J	230 J	270 J	280 J	250 J
Vanadium	ug/kg	30800	23800	72000	990000	430000	750000 DD	5500000 DD	--	--	--	--	9000	9500	17000	18000	15000
Zinc	ug/kg	56300	64100	2400000	5000000	G	170000000	630000000	--	--	--	--	21000	22000	30000	39000	27000
PCBs																	
Aroclor-1016 (PCB-1016)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	40 U	45 U	43 U	45 U	43 U	45 U	42 U	44 U
Aroclor-1221 (PCB-1221)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	40 U	45 U	43 U	45 U	43 U	45 U	42 U	44 U
Aroclor-1254 (PCB-1254)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	40 U	45 U	43 U	62	43 U	45 U	42 U	44 U
Aroclor-1260 (PCB-1260)	ug/kg	NA	NA	NLL	NLL	NLL	4000 T	16000 T	--	40 U	45 U	43 U	45 U	43 U	45 U	42 U	44 U

Notes:
If results are below select background level, all other citeria 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
- Indicates concentration exceeded Part 201 Cleanup Criteria
- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 3

GROUNDWATER ANALYTICAL RESULTS
AUGUST 2012
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]			*MW-2-07*	*MW-37-07*	*MW-63-08*	*MW-64-08*	*MW-68-08*	*MW-74-08*	*MW-79-12*	*MW-80-12*	*MW-81-12*	*MW-82-12*	*MW-83-12*	*MW-84-12*	*MW-84-12*	*MW-85-12*	*MW-87-12*	*MW-88-12*
Sample ID:		Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface																
Sample Date:					*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/29/2012*
Sample Type:																	*Duplicate*			
Parameters	*Units*	a	b	c																
VOCs																				
1,1,1-Trichloroethane	ug/L	200 A	200 A	89	1.0 U	--	1.0 U	1.0 U	1.0 U	**750[abc]**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	54	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	**18[ab]**	1.0 U	1.0 U	1.0 U	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	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
1,2-Dibromo-3-chloropropane (DBCP)	ug/L	0.2 A	0.2 A	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	6.6	19	28	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	25 U	--	25 U	25 U	25 U	120 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
2-Hexanone	ug/L	1000	2900	ID	50 U	--	50 U	50 U	50 U	250 U	50 U	50 U	50 U	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	50 U	--	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Acetone	ug/L	730	2100	1700	50 U	--	50 U	50 U	50 U	250 U	50 U	50 U	50 U	2.8 J	50 U	50 U	50 U	50 U	50 U	50 U
Benzene	ug/L	5 A	5 A	200 X	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon disulfide	ug/L	800	2300	ID	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Carbon tetrachloride	ug/L	5 A	5 A	45 X	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.0	1.0 U	1.0 U
Chlorobenzene	ug/L	100 A	100 A	25	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Chloroform (Trichloromethane)	ug/L	80 A,W	80 A,W	350	1.0 U	--	1.0 U	1.0 U	1.0 U	7.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	12	1.0 U	1.0 U
Chloromethane (Methyl chloride)	ug/L	260	1100	ID	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	0.74 J	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
cis-1,2-Dichloroethene	ug/L	70 A	70 A	620	3.9	--	1.0 U	1.0 U	1.0 U	26	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.2	5.2	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dichlorodifluoromethane (CFC-12)	ug/L	1700	4800	ID	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Ethylbenzene	ug/L	74 E	74 E	18	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.9
Isopropyl benzene	ug/L	800	2300	28	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	3.9 J
Methyl acetate	ug/L	NA	NA	NA	10 U	--	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Methyl cyclohexane	ug/L	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Methylene chloride	ug/L	5 A	5 A	1500 X	5.0 U	--	5.0 U	5.0 U	5.0 U	25 U	5.0 U	5.0 U	5.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 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	1.9	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	NA	NA	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	**25[ab]**	--	1.0 U	1.0 U	1.0 U	**2100[abc]**	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.3	4.4	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane (CFC-11)	ug/L	2600	7300	NA	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	1.0 U	--	1.0 U	1.0 U	1.0 U	5.0 U	1.0 U	1.0 U	1.0 U	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	3.0 U	--	3.0 U	3.0 U	3.0 U	15 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U

TABLE 3

GROUNDWATER ANALYTICAL RESULTS
AUGUST 2012
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]			*MW-2-07*	*MW-37-07*	*MW-63-08*	*MW-64-08*	*MW-68-08*	*MW-74-08*	*MW-79-12*	*MW-80-12*	*MW-81-12*	*MW-82-12*	*MW-83-12*	*MW-84-12*	*MW-84-12*	*MW-85-12*	*MW-87-12*	*MW-88-12*
Sample ID:		Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface																
Sample Date:					*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/29/2012*
Sample Type:																	*Duplicate*			
Parameters	*Units*	a	b	c																
SVOCs																				
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	ug/L				--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4,5-Trichlorophenol	ug/L	730	2100	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dichlorophenol	ug/L	73	210	11	--	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2,4-Dimethylphenol	ug/L	370	1000	380	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrophenol	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,4-Dinitrotoluene	ug/L	7.7	32	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2,6-Dinitrotoluene	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chloronaphthalene	ug/L	1800	5200	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Chlorophenol	ug/L	45	130	18	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Methylnaphthalene	ug/L	260	750	19	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	29[c]
2-Methylphenol	ug/L	370	1000	30 M	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
2-Nitroaniline	ug/L	NA	NA	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
2-Nitrophenol	ug/L	20	58	ID	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
3-Nitroaniline	ug/L	NA	NA	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4,6-Dinitro-2-methylphenol	ug/L	20 M	20 M	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-Bromophenyl phenyl ether	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloro-3-methylphenol	ug/L	150	420	7.4	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Chloroaniline	ug/L	NA	NA	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-Chlorophenyl phenyl ether	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Methylphenol	ug/L	370	1000	30 M	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
4-Nitroaniline	ug/L	NA	NA	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
4-Nitrophenol	ug/L	NA	NA	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Acenaphthene	ug/L	1300	3800	38	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acenaphthylene	ug/L	52	150	ID	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Acetophenone	ug/L	1500	4400	NA	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Anthracene	ug/L	43 S	43 S	ID	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Atrazine	ug/L	3 A	3 A	7.3	--	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzaldehyde	ug/L	NA	NA	NA	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Biphenyl (1,1-Biphenyl)	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	2.2 J
bis(2-Chloroethoxy)methane	ug/L	NA	NA	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	0.60 J	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Caprolactam	ug/L	5800	17000	NA	--	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Carbazole	ug/L	85	350	10 M	--	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Chrysene	ug/L	1.6 S	1.6 S	ID	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Dibenzofuran	ug/L	ID	ID	4	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Diethyl phthalate	ug/L	5500	16000	110	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	1.4 J
Dimethyl phthalate	ug/L	73000	210000	NA	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Di-n-butylphthalate (DBP)	ug/L	880	2500	9.7	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Fluorene	ug/L	880	2000 S	12	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachlorobenzene	ug/L	1 A	1 A	0.2 M	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U

TABLE 3

GROUNDWATER ANALYTICAL RESULTS
AUGUST 2012
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]			*MW-2-07*	*MW-37-07*	*MW-63-08*	*MW-64-08*	*MW-68-08*	*MW-74-08*	*MW-79-12*	*MW-80-12*	*MW-81-12*	*MW-82-12*	*MW-83-12*	*MW-84-12*	*MW-84-12*	*MW-85-12*	*MW-87-12*	*MW-88-12*
Sample ID:		Residential Drinking Water	Non-Residential Drinking Water	Groundwater Surface Water Interface																
Sample Date:					*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/28/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/30/2012*	*08/29/2012*	*08/30/2012*	*08/29/2012*
Sample Type:																	*Duplicate*			
Parameters	*Units*	a	b	c																
Hexachlorobutadiene	ug/L	15	42	0.053	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Hexachlorocyclopentadiene	ug/L	50 A	50 A	ID	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Hexachloroethane	ug/L	7.3	21	6.7 X	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Isophorone	ug/L	770	3100	1300 X	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	520	1500	11	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	**24[c]**
Nitrobenzene	ug/L	3.4	9.6	180 X	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
N-Nitrosodi-n-propylamine	ug/L	5 M	5 M	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
N-Nitrosodiphenylamine	ug/L	270	1100	NA	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 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	--	20 U	20 U	20 U	20 U	20 U	--	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Phenanthrene	ug/L	52	150	2 M	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Phenol	ug/L	4400	13000	450	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Pyrene	ug/L	140 S	140 S	ID	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
Metals																				
Aluminum	ug/L	50 V	50 V	NA	--	--	--	--	--	--	--	30	**89[ab]**	**22000[ab]**	**120[ab]**	48	42	**2300[ab]**	26	43
Antimony	ug/L	6 A	6 A	130 X	--	--	--	--	--	--	--	0.19 J	0.35 J	2.5 J	1.1 J	0.29 J	0.32 J	0.54 J	0.94 J	0.098 J
Arsenic	ug/L	10 A	10 A	10	--	--	--	--	--	--	--	2.5 J	5 U	**41[abc]**	6.6	0.96 J	1.5 J	2.7 J	1 J	**12[abc]**
Barium	ug/L	2000 A	2000 A	1,159	--	--	--	--	--	--	--	98	280	140	25	46	51	23	92	85
Beryllium	ug/L	4 A	4 A	24	--	--	--	--	--	--	--	2 U	2 U	20 U	0.12 J	2 U	2 U	0.13 J	2 U	0.13 J
Cadmium	ug/L	5 A	5 A	4	--	--	--	--	--	--	--	0.052 J	0.13 J	0.72 J	0.12 J	0.079 J	0.11 J	0.49 J	0.15 J	0.11 J
Chromium	ug/L	100 A	100 A	11	--	--	--	--	--	--	--	0.97 J	1.4 J	**34[c]**	0.96 J	0.94 J	0.98 J	3.4 J	0.84 J	0.94 J
Cobalt	ug/L	40	100	100	--	--	--	--	--	--	--	1.1 J	4.1 J	20 J	0.62 J	0.95 J	1.1 J	1.3 J	1.3 J	1.5 J
Copper	ug/L	1000 E	1000 E	20	--	--	--	--	--	--	--	3 J	6.6	83a	3.4 J	4.3 J	3.1 J	9.1	4.9 J	2.1 J
Iron	ug/L	300 E	300 E	NA	--	--	--	--	--	--	--	**410[ab]**	**1600[ab]**	**32000[ab]**	130	130	96	**2400[ab]**	38 J	**2600[ab]**
Lead	ug/L	4 L	4 L	43	--	--	--	--	--	--	--	0.092 J	0.25 J	**25 J[ab]**	0.9 J	0.15 J	0.13 J	1.1 J	0.077 J	0.11 J
Manganese	ug/L	50 E	50 E	4,396	--	--	--	--	--	--	--	**150[ab]**	**190[ab]**	**490[ab]**	19	**68[ab]**	**74[ab]**	23	46	**93[ab]**
Mercury	ug/L	2 A	2 A	0.0013	--	--	--	--	--	--	--	0.2 U	0.2 U	**0.073 J[c]**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	ug/L	100 A	100 A	113	--	--	--	--	--	--	--	10	33	54	5.2	8.2	9.1	6.2	10	11
Selenium	ug/L	50 A	50 A	5	--	--	--	--	--	--	--	2.8 J	**7.4[c]**	**12 J[c]**	0.96 J	5 J	2.6 J	3.8 J	1.9 J	1 J
Silver	ug/L	34	98	0.2 M	--	--	--	--	--	--	--	5 U	**0.3 J[c]**	0.18 J	5 U	5 U	5 U	5 U	5 U	5 U
Thallium	ug/L	2 A	2 A	3.7 X	--	--	--	--	--	--	--	0.088 J	5 U	50 U	0.27 J	5 U	5 U	0.17 J	0.06 J	0.36 J
Vanadium	ug/L	4.5	62	27	--	--	--	--	--	--	--	5 U	5 U	**89[abc]**	0.67 J	5 U	5 U	4.4 J	5 U	5 U
Zinc	ug/L	2400	5000 E	257	--	--	--	--	--	--	--	2.1 J	5.6 J	130	4.6 J	7.3 J	5.7 J	12	3 J	5.6 J
PCBs																				
Aroclor-1016 (PCB-1016)	ug/L	0.5 A	0.5 A	0.2 M	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.17 J	0.25 U	0.25 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	0.25 U	--	--	--	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 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

- Indicates concentration exceeded Part 201 Cleanup Criteria

- Indicates concentration exceeded applicable Part 201 Cleanup Criteria

TABLE 4

SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION PONTIAC, MICHIGAN

AOI Number	AOI Name	Sampling Reason	Identified in the RCES as a Current Environmental Issue	Proposed Sample Locations (1)			Anticipated Maximum Boring Depth (ft bgs) (4)	Anticipated MW Screened Interval (ft bgs)	Analytical Parameters (5)
				Matrix	Number of Samples (2)(3)	Location			
AOI 1	Historical Operations Former Plant 1	Due to limited availability to place a monitoring well directly down gradient from MW72-08, up to four temporary monitoring wells will be placed along the northern boundary of the Site and directly down-gradient to MW72-08. Up to two groundwater samples will be collected from each of the four new temporary monitoring wells. If non-saturated soil impacts are encountered during installation of temporary or permanent monitoring wells, a soil sample will be collected from the most impacted zone and up to two additional samples will be collected to delineate vertically (to the extent possible).	No	Soil	TBA	NA	TBA	NA	TBA
			No	Groundwater	10 (6)	New temporary off-Site wells - TMW1S/I-12, TMW2S/I-12, TMW3S/I-12 and TMW4S/I-12 Permanent off-Site well MW92S/I-12	20	Based on hydrogeology (saturated sands), interval between 9-12 feet bgs and 18-20 feet bgs	VOCs
AOI 2	Historical Operations Former Plants 3, 4 and 5	To delineate groundwater, one groundwater monitoring well will be installed approximately 200 feet east of MW74-08.	No	Soil	NA	NA	NA	NA	NA
			No	Groundwater	1	MW91-12	20	Based on hydrogeology (saturated sands), 5 foot interval between 10-15	VOCs
AOI 12	Bare Soil Area	Three soil borings will be installed to delineate the PAHs horizontally and vertically. An additional three step-out soil borings will be installed outside the initial borings and samples will be placed on hold pending review.	No	Soil	12 (7)	BH109-12, BH110-12, BH111-12, BH112-12, BH113-12 and BH114-12	5	NA	PAHs
			No	Groundwater	0	NA	NA	NA	NA
AOI 20	Former Transformer Substations and Large Capacitors	To delineate groundwater, one groundwater monitoring well will be installed to the south of the former Paint Mix Rooms and one to the east of MW88-12.	Yes	Soil	NA	NA	NA	NA	NA
			No	Groundwater	2	MW89-12 and MW90-12	20	Based on hydrogeology (saturated sands), 5 foot interval between 15-20	MW89-12 VOCs MW90-12 PAHs and VOCs
AOI 22	Paint Mix Rooms	See AOI 20	Yes	Soil	NA	NA	NA	NA	NA
			No	Groundwater	Same as AOI 20	Same as AOI 20	Same as AOI 20	Same as AOI 20	Same as AOI 20
AOI 28	LNAPL Plume	Two soil borings will be placed within the LNAPL plume and LNAPL saturated soil will be analyzed.	No	Soil	4	BH112-12 and BH113-12	30	NA	VOCs, SVOCs, PCBs and metals
			No	Groundwater	0	NA	TBA	TBA	TBA

Notes:
(1) See Figure 5 for proposed soil boring/monitoring well locations.
(2) Additional soil samples will be collected for laboratory analysis if field evidence of impact are observed.
(3) Quality Assurance/Quality Control samples will consist of one duplicate/ten samples/media and trip blanks (not included in number of samples).
(4) If not designated for a specific depth, the soil sample depth will be based on field observations and selected with the following order of significance: containing evidence of visual/olfactory impact; or the highest PID reading; or specific target depth (e.g. 10 to 12 ft bgs for USTs); or just above the water table; or the terminus of the soil boring.
(5) Field parameters for groundwater to include turbidity, temperature, specific conductance, pH, D.O. and ORP
(6) Total number of samples include two groundwater samples per TMW and permanent off-Site well location
(7) Total number of samples include step-out borings

" - Inches.
' - Feet.
BH - Borehole.
BTEX - Benzene, toluene, ethylbenzene, xylenes.
DCC - Direct Contact Criteria.
DWC - Drinking Water Criteria
ft bgs - Feet below ground surface.
ESA - Environmental Site Assessment.
MW - Monitoring well.
NA - Not Applicable
PCBs - Polychlorinated biphenyls.
PAOC - Potential Area of Concern.
PAHs - Polycyclic aromatic hydrocarbons
PVC - Polyvinyl Chloride.
PSIC- Particulate Soil Inhalation
SVOCs - Semi-volatile organic compounds.
GCC - Groundwater Contact Criteria.
GCPC - Groundwater Contact Protection Criteria.
VOCs - Volatile organic compounds.
VSIC - Infinite Source Volatile Soil Inhalation Criteria.
TAL - Target Analyte List.
TBA - To be assessed during Phase III ESA field activities
TCL - Target Compound List.
TCE - Trichlchroethelyene

TABLE 5

CONTAINER, PRESERVATION, SHIPPING AND PACKAGING REQUIREMENTS
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

Analyses	*Sample Containers* [1]	*Preservation*	*Maximum Holding Time from Sample Collection* [2]	*Volume of Sample*	*Shipping*	*Normal Packaging*
SOLID (Soil)						
VOCs	One 40-ml VOA vial[3]	10-ml Methanol, Iced, 4 ± 2° C	14 days for analysis	10 grams	Overnight or Hand Deliver	Bubble Wrap
SVOCs	One 120-mL glass jar	Iced, 4 ± 2° C	14 days for preparation 40 days after preparation for analysis	Fill to shoulder of jar	Overnight or Hand Deliver	Bubble Wrap
PAHs	One 120-mL glass jar	Iced, 4 ± 2° C	14 days for preparation 40 days after preparation for analysis	Fill to shoulder of jar	Overnight or Hand Deliver	Bubble Wrap
PCBs	One 120-mL glass jar	Iced, 4 ± 2° C	14 days for preparation 40 days after preparation for analysis	Fill to shoulder of jar	Overnight or Hand Deliver	Bubble Wrap
Metals	One 120-mL glass jar	Iced, 4 ± 2° C	180 days (mercury 28 days) for analysis	Fill to shoulder of jar	Overnight or Hand Deliver	Bubble Wrap
WATER						
VOCs	Three 40-ml septum top vials	Iced, 4 ± 2° C HCl to pH<2	14 days from sample collection to completion of analysis	Fill completely, no air bubbles	Overnight or Hand Delivery	Bubble Wrap, Foam Inserts
SVOCs	Two 1-L amber glass bottle	Iced, 4 ± 2° C	7 days from sample collection to extraction; 40 days from extraction to completion of analysis	Fill to neck of bottle	Overnight or Hand Delivery	Bubble Wrap
PAHs	Two 1-L amber glass bottle	Iced, 4 ± 2° C	7 days from sample collection to extraction; 40 days from extraction to completion of analysis	Fill to neck of bottle	Overnight or Hand Delivery	Bubble Wrap

TABLE 5

CONTAINER, PRESERVATION, SHIPPING AND PACKAGING REQUIREMENTS
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

Analyses	*Sample Containers* [1]	*Preservation*	*Maximum Holding Time from Sample Collection* [2]	*Volume of Sample*	*Shipping*	*Normal Packaging*
WATER (continued)						
PCBs	Two 1 liter amber glass bottles per analysis	Iced, 4 ± 2° C	7 days for extraction 40 days after extraction for analysis	Fill to neck of bottle	Overnight or Hand Deliver	Bubble Wrap
Metals	One 1 liter plastic bottle	HNO_3 to pH < 2 Iced, 4 ± 2° C	180 days (mercury-28 days) for analysis	Fill to neck of bottle	Overnight or Hand Deliver	Bubble Wrap

Notes:
[1] - Multiple parameters on a single sample may be combined into one single 16 ounce glass jar.
[2] - These are technical holding times, i.e., are based on time elapsed from time of sample collection.
[3] - Soil VOC samples will be collected using a coring device (TerraCore®) with minimal disrutpion the soil and placed directly into a pretarred vial containing 10-ml of methanol.

TCL - Target Compound List
VOCs - Volatile Organic Compounds
SVOCs - Semi-Volatile Organic Compounds
PCBs - Polychlorinated Biphenyls
TAL - Target Analyte List
PAHs - Polynuclear Aromatic Hydrocarbons

TABLE 6

SUMMARY OF ANALYTICAL METHODS
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

Parameter[1]	*Preparation Method*[2]	*Laboratory Preparation SOP*	*Analytical Method*[2]	*Laboratory Analytical SOP*
Groundwater Samples				
VOC	SW-846 5030B	HN-VMS-003-R03	SW-846 8260B	HN-VMS-003-R03
SVOC	SW-846 3510C	HN-EXT-001-R05	SW-846 8270C	HN-SMS-001-R04
PAH	SW-846 3510C	HN-EXT-001-R05	SW-846 8270C	HN-SMS-001-R04
PCB	SW-846 3500 series	HN-EXT-001-R05	SW-846 8082	HN-GC-002-R05
Metals				
ICP/MS Metals	SW-846 3010A/3020A	HN-MET-010-R03	SW-846 6020	HN-MET-008-R04
Mercury	SW-846 7470A	HN-MET-005-R05	SW-846 7470A	HN-MET-005-R05
Soil/Sediment Samples				
VOC	SW-846 5035	HN-P&T-004-R01	SW-846 8260B	HN-VMS-003-R03
SVOC	SW-846 3550B	HN-EXT-003-R02	SW-846 8270C	HN-SMS-001-R04
PAH	SW-846 3550B	HN-EXT-003-R02	SW-846 8270C	HN-SMS-001-R04
PCB	SW-846 3545	HN-EXT-003-R02	SW-846 8082	HN-GC-002-R05
Metals				
ICP/MS Metals	SW-846 3050B	HN-MET-009-R03	SW-846 6020	HN-MET-008-R04
Mercury	SW-846 7471A	HN-MET-006-R04	SW-846 7471A	HN-MET-006-R04

Notes:

1 Refer to Table 6 for the compounds/elements of each parameter group.

2 Preparation and Analytical Method References:

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

VOC = Volatile Organic Compounds
SVOC = Semi-volatile Organic Compounds
PCB = Polychlorinated Biphenyls
PAH = Polynuclear Aromatic Hydrocarbons
ICP/MS = Inductively Coupled Plasma/Mass Spectrometer

TABLE 7

SOIL AND GROUNDWATER SAMPLE PARAMETER LIST
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

	Targeted Quantitation Limits (TQL) [1]		*Method Detection Limits (MDL)* [2]	
Compound	*Water (µg/L)*	*Soil (µg/kg)*	*Water (µg/L)*	*Soil (µg/kg)*
Target Compound List (TCL) Volatile Organic Compounds (VOC)				
Acetone	50	1000	0.328	64
Benzene	1	50	0.183	12
Bromodichloromethane	1	100	0.116	7
Bromoform	1	100	0.147	6
Bromomethane	5	200	0.214	11
2-Butanone	25	750	0.220	74
Carbon disulfide	5	250	0.174	15
Carbon tetrachloride	1	50	0.123	9
Chlorobenzene	1	50	0.126	12.2
Chloroethane	5	250	0.458	64
Chloroform	1	50	0.152	12
Chloromethane	5	250	0.160	17
Cyclohexane	1	1,200	0.223	13
Dibromochloromethane	5	100	0.133	6
1,2-Dibromo-3-chloropropane	1 [2]	50 [2]	0.311	15
1,2-Dibromoethane	1 [2]	50 [2]	0.165	12
1,2-Dichlorobenzene	1	100	0.132	12
1,3-Dichlorobenzene	1	100	0.160	12.0
1,4-Dichlorobenzene	1	100	0.146	11
Dichlorodifluoromethane	5	250	0.198	14
1,1-Dichloroethane	1	50	0.110	11
1,2-Dichloroethane	1	50	0.152	14
1,1-Dichloroethene	1	50	0.116	13
cis-1,2-Dichloroethene	1	50	0.111	12
trans-1,2-Dichloroethene	1	50	0.124	9
1,2-Dichloropropane	1	50	0.131	9.9
cis-1,3-Dichloropropene	1	50	0.081	10.3
trans-1,3-Dichloropropene	1	50	0.148	10
Ethylbenzene	1	50	0.134	11.1
2-Hexanone	50	2,500	0.119	7
Isopropylbenzene	5	250	0.135	12.9
Methyl acetate	10	1,200	0.191	40
Methylene chloride	5	100	0.186	12
Methylcyclohexane	1	1,200	0.986	14
4-Methyl-2-pentanone	50	2,500	0.096	10
Methyl tert-butyl ether	5	250	0.070	13
Styrene	1	50	0.107	11
1,1,2,2-Tetrachloroethane	1	50	0.130	13.2
Tetrachloroethene	1	50	0.152	13
Toluene	1	100	0.122	11
1,2,4-Trichlorobenzene	5	330	0.164	16
1,1,1-Trichloroethane	1	50	0.135	11

TABLE 7

SOIL AND GROUNDWATER SAMPLE PARAMETER LIST
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

	Targeted Quantitation Limits (TQL) [1]		*Method Detection Limits (MDL)* [2]	
Compound	*Water (µg/L)*	*Soil (µg/kg)*	*Water (µg/L)*	*Soil (µg/kg)*
TCL VOC (continued)				
1,1,2-Trichloroethane	1	50	0.084	11
Trichloroethene	1	50	0.136	14
Trichlorofluoromethane	1	100	0.181	8.3
1,1,2-Trichloro-1,2,2-trifluoroethane	1	250	0.180	11
Vinyl chloride	1	40	0.173	14
Xylenes (total)	3	150	0.289	35
TCL Semi-Volatile Organic Compounds (SVOC)				
Acenaphthene	5	330	0.113	9.12
Acenaphthylene	5	330	0.124	9.46
Acetophenone	5	330	0.09	4.98
Anthracene	5	330	0.725	10.17
Atrazine	3	50	0.130	10.1
Benzaldehyde	10	330	0.159	12.7
Benzo(a)anthracene	1	330	0.574	12.17
Benzo(a)pyrene	1	330	0.103	15.44
Benzo(b)fluoranthene	1	330	0.739	16.11
Benzo(g,h,i)perylene	1	330	0.701	23.54
Benzo(k)fluoranthene	1	330	0.174	13.6
1,1'-Biphenyl	10	330	0.095	4.96
4-Bromophenylphenyl ether	5	330	0.111	8.68
Butylbenzylphthalate	5	330	0.107	13.83
di-n-Butyphthalate	5	330	0.711	10.04
Caprolactam	10	330	4.7	14.5
Carbazole	10	330	0.835	11.4
4-Chloroaniline	10	330	1.128	12.74
bis(2-Chloroethoxy)methane	5	330	0.134	8.2
bis(2-Chloroethyl)ether	1	100	0.111	8.33
2,2'-oxibis(1-Chloropropane)	5	330	0.117	7.79
4-Chloro-3-methylphenol	5	280	0.647	9.03
2-Chloronaphthalene	5	330	0.128	9.13
2-Chlorophenol	10	330	0.726	8.95
4-Chlorophenyl phenyl ether	5	330	0.1	9.14
Chrysene	1	330	0.71	11.31
Dibenz(a,h)anthracene	2	330	0.671	17.06
Dibenzofuran	4	330	0.114	9.13
3,3'-Dichlorobenzidine	1 [2]	2,000	0.537	9.33
2,4-Dichorophenol	10	330	0.216	9.71
Diethylphthalate	5	330	0.686	8.3
2,4-Dimethylphenol	5	330	0.244	40.75
Dimethylphthalate	5	330	0.138	8.33
4,6-Dinitro-2-methylphenol	20	830	0.343	48.1

TABLE 7

SOIL AND GROUNDWATER SAMPLE PARAMETER LIST
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

	Targeted Quantitation Limits (TQL) [1]		*Method Detection Limits (MDL)* [2]	
Compound	*Water (µg/L)*	*Soil (µg/kg)*	*Water (µg/L)*	*Soil (µg/kg)*
TCL Semi-Volatile Organic Compounds (cont'd)				
2,4-Dinitrophenol	25	830	0.376	42.43
2,4-Dinitrotoluene	5	330	0.785	8.93
2,6-Dinitrotoluene	5	330	0.821	9.35
bis(2-Ethylhexyl)phthalate	5	330	0.118	9.9
Fluoranthene	1	330	0.774	11.89
Fluorene	5	330	0.102	8.74
Hexachlorobenzene	0.5 [2]	330	0.103	9.09
Hexachlorobutadiene	0.5 [2]	50	0.124	8.44
Hexachlorocyclopentadiene	5	330	0.184	34.89
Hexachloroethane	5	300	0.127	8.74
Indeno(1,2,3-cd)pyrene	2	330	0.694	18.93
Isophorone	5	330	0.116	8.67
2-Methylnaphthalene	5	330	0.129	9.82
2-Methylphenol	10	330	0.605	9.62
4-Methylphenol	10	330	0.553	9.81
Naphthalene	5	330	0.123	8.53
2-Nitroaniline	25	830	0.106	7.61
3-Nitroaniline	25	830	2.501	81.2
4-Nitroaniline	25	830	1.5	14.79
Nitrobenzene	3	330	0.102	8.65
2-Nitrophenol	5	330	0.188	8.7
4-Nitrophenol	25	830	1.554	40.45
N-Nitroso-di-n-propylamine	5	330	0.13	8.74
N-Nitrosodiphenylamine	5	330	0.81	59.33
di-n-Octylphthalate	5	330	0.122	12.31
Pentachlorophenol	1	20	0.11	14.75
Phenanthrene	2	330	0.862	30
Phenol	5	330	0.094	8.46
Pyrene	5	330	0.652	12.47
2,4,5-Trichlorophenol	5	330	0.115	7.97
2,4,6-Trichlorophenol	4	330	0.108	7.96
TCL Polychlorinated Biphenyls (PCB)				
Aroclor 1016	0.2	330	0.067	10.58
Aroclor 1221	0.2	330	0.067	10.58
Aroclor 1232	0.2	330	0.067	10.58
Aroclor 1242	0.2	330	0.067	10.58
Aroclor 1248	0.2	330	0.067	10.58
Aroclor 1254	0.2	330	0.360	8.35
Aroclor 1260	0.2	330	0.360	8.35

TABLE 7

SOIL AND GROUNDWATER SAMPLE PARAMETER LIST
SAMPLING AND ANALYSIS PLAN
PCC-VALIDATION
PONTIAC, MICHIGAN

	Targeted Quantitation Limits (TQL) [1]		*Method Detection Limits (MDL)* [2]	
Compound	*Water (µg/L)*	*Soil (mg/kg)*	*Water (µg/L)*	*Soil (mg/kg)*
Site-specific Target Analyte List (TAL) Metals				
Aluminum	50	1	1.74	0.036
Antimony	2	0.3	0.039	0.006
Arsenic	5	0.1	0.717	0.03
Barium	100	1	0.274	0.009
Beryllium	1	0.5	0.048	0.003
Cadmium	1	0.2	0.034	0.001
Chromium	10	2	0.042	0.007
Cobalt	20	0.5	0.039	0.001
Copper	4	1	0.123	0.007
Iron	200	5	2.832	0.844
Lead	3	1	0.027	0.001
Manganese	50	1	0.111	0.007
Mercury	0.200	0.05	0.008	0.001
Nickel	20	1	0.169	0.003
Selenium	5	0.2	0.411	0.018
Silver	0.2	0.1	0.025	0.001
Thallium	2	0.5	0.029	0.004
Vanadium	4	1	0.305	0.013
Zinc	50	1	0.588	0.026
Polynucler Aromatic Hydrocarbonns (PAHs)				
Acenaphthene	5	330	0.113	9.12
Acenaphthylene	5	330	0.124	9.46
Anthracene	5	330	0.725	10.17
Benzo(a)anthracene	1	330	0.574	12.17
Benzo(a)pyrene	1	330	0.103	15.44
Benzo(b)fluoranthene	1	330	0.739	16.11
Benzo(g,h,i)perylene	1	330	0.701	23.54
Benzo(k)fluoranthene	1	330	0.174	13.6
Chrysene	1	330	0.71	11.31
Dibenz(a,h)anthracene	2	330	0.671	17.06
Fluoranthene	1	330	0.774	11.89
Fluorene	5	330	0.102	8.74
Indeno(1,2,3-cd)pyrene	2	330	0.694	18.93
2-Methylnaphthalene	5	330	0.129	9.82
Naphthalene	5	330	0.123	8.53
Phenanthrene	2	330	0.862	30
Pyrene	5	330	0.652	12.47

Notes:

1 Please note that these targeted quantitation limits (TQLs) are based on the the MDEQ OpMemo 2 Target Detection Limits (TDLs) and are presented for guidance only. Actual quantitation limits are highly laboratory and matrix dependent and may be elevated due to matrix effects, QA/QC problems and high concentrations of target and non-target analytes.

2 These footnoted TQLs do not meet the MDEQ OpMemo 2 TDLs.