

**Revitalizing Auto Communities Environmental  
Response (RACER) Trust**

**RCRA Corrective Action**

**Corrective Measure Pre-Design Report –  
Lower 1,4-Dioxane Source Evaluation**

Plants 2, 3, & 6, Industrial Land  
Lansing, Michigan

December 3, 2014



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## 1. Introduction

ARCADIS U.S., Inc. (ARCADIS) has prepared this Corrective Measure Pre-Design Report – Lower 1,4-Dioxane Source Evaluation (report) on behalf of the Revitalizing Auto Communities Environmental Response (RACER) Trust in cooperation with the Michigan Department of Environmental Quality (MDEQ) for the Lansing Plant 3 located in Lansing, Michigan (Site). This report describes activities conducted to further characterize the nature and extent of the lower 1,4-dioxane source area located near the “coliseum” on the southwestern portion of Plant 3. The coliseum is the basement of the former Building 304 and 305 press pit operations (AOI 3-51) constructed to a depth of 15 to 20 feet below grade. The basement was formerly used to house equipment for stamping automobile parts. Upon demolition of the Plant 3 building, the basement was exposed and is currently a 3-acre, 15- to 20-foot deep pit that collects surface runoff and precipitation.

Work completed was consistent with the scope described in the *Corrective Measure Pre-Design Work Plan – Lower 1,4-Dioxane Source Evaluation* (Work Plan; ARCADIS 2014a) provided to the MDEQ on June 24, 2014 and subsequently approved on July 2, 2014. The lower 1,4-dioxane source evaluation was completed to support the proposed corrective measures for the lower 1,4-dioxane plume that currently includes groundwater recirculation as the proposed remedy (ARCADIS 2014b). Figure 1 shows the location of Plant 3 and the lower 1,4-dioxane source evaluation area.

In general, the results of the lower 1,4-dioxane source area evaluation identify the following:

- Perched zone impacts are limited in extent, with the highest 1,4-dioxane concentrations located in low permeability, generally dry, glacial till materials.
- Leach testing indicates samples from the most impacted portions of the perched zone could potentially leach at low concentrations; however, the hydraulic characteristics of the sediments suggest limited actual in-situ leaching.
- The concentrations of other volatile organic compounds (VOCs) in the perched zone and lower 1,4-dioxane source area are generally low and will not significantly impact the proposed remedy design for the 1,4-dioxane plume as outlined in the *Corrective Measures Study* (CMS; ARCADIS 2014b).
- Lower overburden and weathered bedrock data indicates the footprint of the lower 1,4-dioxane plume is smaller than previous estimates. The mass of 1,4-dioxane remaining in the saturated deep overburden within the evaluation area is estimated to be approximately 0.6 Kg.

- The total mass of the lower 1,4-dioxane plume is estimated to be approximately 22 Kg, suggesting that greater than 90% is currently located downgradient of the lower 1,4-dioxane source area (as defined by the area investigated as part of this evaluation).

## 1.1 Background

The Work Plan (ARCADIS 2014a) provides an expanded background discussion. Beginning in the late 1950s, 1,4-dioxane was used as a stabilizer for 1,1,1-trichloroethane (1,1,1-TCA) and these compounds are often found together in the subsurface. During the initial phases of the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI), soil samples were not analyzed for 1,4-dioxane. However, soils in the perched zone south of the coliseum contain 1,1,1-TCA and other VOCs that extend north from a former sump area (AOI 3-54) up to the south wall of the coliseum, suggesting that 1,4-dioxane could potentially be present in soil and groundwater within the perched zone.

The lower 1,4-dioxane plume is located within the deep overburden and weathered bedrock and originates from the area beneath the perched zone near the south wall of the coliseum. Monitoring wells installed within the deep overburden and weathered bedrock in this area indicates concentrations of 1,4-dioxane up to 500 micrograms per liter ( $\mu\text{g/L}$ ) in groundwater. The lower 1,4-dioxane plume extends from the source area to the southeast across Saginaw Avenue and then to the south-central portion of Plant 2.

Although initially characterized as part of the *Resource Conservation and Recovery Act Facility Investigation Supplemental Phase 2 Activities Summary Report* (RFI Phase 2 Report; ARCADIS 2014c), additional resolution on the location, extent, and hydraulic characteristics of the lower 1,4-dioxane source area was required to effectively confirm and design the proposed corrective measures for the lower 1,4-dioxane plume.

## 1.2 Lower 1,4-Dioxane Source Evaluation Objectives

The primary goal of this evaluation was to further characterize the nature and extent of the 1,4-dioxane source mass located near the coliseum. Information from this evaluation will be used to evaluate the treatability of the 1,4-dioxane source mass and verify the viability of the remedy proposed as part of the CMS (ARCADIS 2014b).

The specific objectives of this study were as follows:

1. Perched Zone: Determine if the 1,4-dioxane source mass is present and continuing to contribute to the lower 1,4-dioxane plume. If present:
  - Define the nature and extent of the 1,4-dioxane impacts

- Determine if the source mass is concentrated or diffuse
- Evaluate the range of permeability within the lower 1,4-dioxane source area
- If determined to be a source of 1,4-dioxane that contributes to the lower 1,4-dioxane plume at concentrations potentially above MDEQ Part 201 Criteria, evaluate the treatability of the perched zone impacts.

2. Deep Overburden/Weathered Bedrock: Determine the size and extent of the lower 1,4-dioxane source area plume.

- Evaluate the hydrogeologic characteristics of the lower 1,4-dioxane source area
- Evaluate the treatability of the lower 1,4-dioxane source mass

The investigation primarily utilized soil sampling, both vadose and saturated, to meet the objectives. Saturated soil can be converted to an approximate groundwater equivalent concentration for comparison to the known groundwater conditions, and as a means of assessing relative strength of the remaining source mass. A focus on soil sampling allowed for rapid, adaptive, and high-resolution characterization of the perched and lower zones resulting in a detailed depiction of the current site conditions within the lower 1,4-dioxane source area.

## **2. Field Activities**

Source characterization site activities were completed over a 3-week period from July 15 to July 31, 2014. Work completed was consistent with the scope described within Work Plan (ARCADIS 2014a). A complete description of field sampling activities, laboratory methodology, soil to equivalent groundwater calculation, and comparison of on-site versus fixed laboratory analysis results is provided as Appendix A.

The site evaluation consisted of soil borings completed using sonic drilling techniques and soil sampling completed at high frequency (nominal 3-foot interval). Appendix B includes soil boring logs. Select groundwater samples were also collected for comparison to the saturated soil and equivalent groundwater concentrations. ARCADIS used an adaptive approach to the soil borings based on the near real-time analysis of 1,4-dioxane completed on site by Triad Environmental Solutions, Inc. of Durham, North Carolina (Triad ES). Refinement borings were completed only as needed to meet the goals of the study. Figure 2 presents soil borings completed as part of the lower 1,4-dioxane source area characterization. The scope of work completed includes the following:

- 25 soil borings to bedrock (90 to 95 feet below grade)
- More than 800 soil samples analyzed on site for 1,4-dioxane
- More than 500 soil samples analyzed on site for VOCs
- On-site analysis of nine discrete groundwater samples for VOCs and/or 1,4-dioxane
- Off-site analysis of select soil samples for 1,4-dioxane, VOCs, synthetic precipitation leaching procedure (SPLP), and fraction of organic carbon
- Off-site analysis of select groundwater samples for VOCs and 1,4-dioxane
- Soil samples were also submitted to Materials Testing Consultants, Inc. in Grand Rapids, Michigan for geotechnical analysis, including vertical hydraulic conductivity and porosity.

The Triad ES 1,4-dioxane analysis method is based on solid-phase micro extraction followed by mass spectrometric analysis using the direct sampling ion trap mass spectrometer (DSITMS) (Triad ES 2014). This method has been demonstrated to provide quantitative analysis of 1,4-dioxane to detection limits of 1 to 2 µg/L for groundwater and 5 to 8 micrograms per kilogram (µg/kg) for soil samples. Tables 1 and 2 summarize DSITMS



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analytical data collected during this event. Appendix C includes DSITMS quality assurance/quality control sample results. Select duplicate samples were also submitted to a fixed-based laboratory – Merit Analytical Laboratory (Merit) in Lansing, Michigan – for comparison to the DSITMS data. Appendix D includes a comparison of the DSITMS results to the fixed laboratory results, and Appendix E includes Merit analytical reports.

### **3. Results**

This section summarizes the results of the lower 1,4-dioxane source evaluation. Site geology and hydrogeology are discussed first, followed by a summary of the distribution of 1,4-dioxane and VOCs in soil and groundwater.

#### **3.1 Geology and Hydrogeology**

The following provides a brief description of the hydrogeologic setting of the lower 1,4-dioxane source area. Additional details, including numerous cross-sections and output from the three-dimensional model, are available as part of the RFI Phase 2 Reports (ARCADIS 2013, 2014c). Figure 3 includes a conceptual cross-section illustrating the geology for 1,4-dioxane source area. Geology observed at the borings advanced during this pre-design study was generally consistent with the observations during previous investigations.

##### **3.1.1 Lower 1,4-Dioxane Source Area Stratigraphy**

The complex sedimentary environment present at the Site includes a thick sequence of glaciofluvial and glacial till sediments consisting predominantly of clays and silts, with discontinuous layers of sand, silty sand, and occasional gravel. Consistent with the findings of the RFI, and the Site as a whole, the geology of the lower 1,4-dioxane source area can be divided into six general hydrostratigraphic units (from shallow to deep):

- Shallow fill – placed as part of construction – poorly sorted silt/sand/gravel
- Interbedded zone – limited in thickness and extent relative to Plants 2 and 6
- Glacial till – dense, dry
- Deep overburden – primarily silt and silty sand
- Weathered bedrock – weathered Grand River Formation
- Bedrock – Grand River Formation – fine-grained sandstone

Figure 3 provides a conceptual cross-section of the lower 1,4-dioxane source area.

##### **3.1.2 Source Area Hydrogeology**

There are two water-bearing zones within the lower 1,4-dioxane source area:

1. Perched Zone – Occasional saturated more permeable layers of limited extent occurring within the fill or interbedded zone south of the coliseum
2. Deep Overburden/Weathered Bedrock – Location of the lower 1,4-dioxane plume

The two zones are separated by a dense layer of glacial till located beneath the thin fill and interbedded zone (approximately 10 to 25 feet below ground surface [bgs]) followed by a 35-foot-thick sequence of dry sand and silt vadose zone. The deep overburden water table is encountered approximately 65 feet bgs. Depth to the weathered bedrock varies across the lower 1,4-dioxane source area from approximately 95 feet bgs in the northwest to 80 feet bgs in the southeast.

Perched water was only encountered at one location (SB-HH24) during source evaluation field activities. This boring is located approximately 100 feet south of soil boring SB-GX24/24b, where the maximum concentrations of 1,4-dioxane in soil are located. In general, saturated permeable zones within the perched 1,4-dioxane source area are uncommon, and when present, are limited in extent. The most heavily impacted soils in the source area consist of low-permeability glacial till 12 to 20 feet bgs adjacent to the southern coliseum wall.

### **3.2 Correlation of Fixed and Mobile Laboratory Results**

A subset of the soil samples analyzed on site for 1,4-dioxane by DSITMS were also analyzed off site by a fixed-base laboratory. During the course of the field activities, three different types of soil samples were analyzed off site for 1,4-dioxane. Details regarding the sample sets submitted for analysis by the fixed lab are provided in Appendix A. Tables summarizing the off-site laboratory data and compared to the equivalent Triad ES data are included as Appendix D. Appendix D also includes a graphical comparison of the various Merit and Triad ES data.

There is a strong correlation and acceptable agreement between the methods, particularly between samples split from the mobile laboratory aqueous extracts. Splitting of the aqueous extracts eliminates sampling bias and provides a true comparison of analytical methods. As expected, the results from extract samples have a stronger correlation than collocated samples. In general, the comparison indicates the DSITMS 1,4-dioxane soil data is of sufficient quality to support the intended decisions of the evaluation.

### **3.3 Distribution of 1,4-Dioxane and Volatile Organic Compounds in Soil**

Figures 4 through 6 illustrate the plan view distribution of 1,4-dioxane in soil, based on the DSITMS data. Separate maps are provided for the perched zone (0 to 25 feet bgs; Figure

4), the vadose zone (25 to 55 feet bgs; Figure 5), and the deep overburden saturated zone (greater than 55 feet bgs; Figure 6). Screenshots from the 3D model of the lower 1,4-dioxane source area are included as Figure 7. The following sections summarize key observations from review of the 1,4-dioxane and VOCs results.

### 3.3.1 1,4-Dioxane in Soil

Perched Zone: Concentrations of 1,4-dioxane were generally diffuse (typically less than 20 µg/Kg), with small zones of higher concentration near the coliseum. Of the more than 800 samples analyzed on site, only four had 1,4-dioxane concentrations greater than 1,000 µg/Kg. These four samples were collected from the perched zone at GX-24/24b, near the southern wall of the coliseum. The surrounding borings 25 to 50 feet away did not contain 1,4-dioxane concentrations above 200 µg/Kg in the perched zone. In addition:

- The higher concentrations of 1,4-dioxane at GX-24/24b were observed in samples collected from the low-permeability glacial till.
- SPLP testing (Appendix A, Section 3.3) indicated the most impacted material in the perched zone does not leach at a concentration indicative of a significant ongoing source to the lower 1,4-dioxane plume. Of the 12 samples analyzed, only two had detectable leachate concentrations of 48 and 22 µg/L. These samples were collected from the dense, dry glacial till zone consistent with the zone of highest 1,4-dioxane concentrations observed during the evaluation.
- The most heavily impacted soil within the perched zone occurs within the low permeability glacial till (i.e. GX-24/24b). SPLP testing of samples from this zone indicate relatively low concentrations (48 and 22 µg/L) of 1,4-dioxane in the leachate. The vertical hydraulic conductivity of the till ranges between  $10^{-6}$  and  $10^{-8}$  cm/sec suggesting limited potential for in-situ leaching. Groundwater availability within the perched zone is limited in this area. A temporary well installed at a depth of 12-19 ft bgs at SB-GX24 was dry. Only a single water bearing zone was encountered during the evaluation at a location 100' south of SB-GX24 (VAP-HH24 19.5-24.5). A sample collected from this zone indicates 1,4-dioxane at a concentration of 19.8 µg/L.
- A volumetric analysis based on the environmental visualization system (EVS) model suggests only an estimated 0.3 kilograms (Kg) of 1,4-dioxane mass remains within the perched zone. The volumetric output from the EVS model is summarized in Appendix F.

- Detections of 1,4-dioxane within the vadose zone located between the perched zone and saturated deep overburden are sporadic with a footprint similar to that of the overlying perched zone and concentrations less than 100 µg/Kg.

Deep Overburden/Weathered Bedrock: Saturated soil samples from the deep overburden and weathered bedrock also indicate a diffuse zone of impacts. The maximum concentration of 1,4-dioxane observed within the deep overburden was 110 µg/Kg at 70 feet bgs near existing monitoring well MW-12-21.

Chemical-specific properties of 1,4-dioxane and site-specific values for soil properties can be used to convert saturated soil concentrations into equivalent groundwater concentrations. The equilibrium partitioning equation, with adjustments for saturated soils, predicts a groundwater to saturated soil ratio of approximately 6 times. For example, the maximum 1,4-dioxane saturated soil concentration of 110 µg/Kg observed during this study would correspond to an equivalent groundwater concentration of 660 µg/L. This is in general agreement with the maximum 1,4-dioxane groundwater concentration of 510 µg/L detected at MW-12-21.

Based on this relationship between saturated soil and groundwater, data collected during this study indicate the footprint of the lower 1,4-dioxane source area plume is smaller than the previous estimate depicted as part of the RFI (ARCADIS 2014c). The 3D depiction of the lower 1,4-dioxane source area is included as Figure 7. The mass of 1,4-dioxane remaining within the saturated deep overburden, as shown on Figure 7, is approximately 0.6 Kg (Appendix F). Based on the volumetric data presented in Appendix F, the total mass of the lower 1,4-dioxane plume is estimated to be approximately 22 Kg, suggesting that 21.4 of the 22 Kg, or greater than 90%, is currently located downgradient of the lower 1,4-dioxane source area as defined by the area investigated as part of this evaluation.

### 3.3.2 Volatile Organic Compounds in Soil

During the RFI, it was determined that soils in the perched zone south of the coliseum contain 1,1,1-TCA and other chlorinated VOCs that extend north from a former sump area up to the south wall of the coliseum. Based on the results of the lower 1,4-dioxane source area evaluation, the primary source of 1,4-dioxane may be a separate sump located adjacent to the south wall of the coliseum.

In addition, chlorinated VOCs and 1,4-dioxane are generally coincident within the perched zone. Total chlorinated VOC concentrations south of the coliseum are relatively low, with the highest concentrations (up to 500 µg/Kg) observed within the perched zone. During the evaluation, benzene, toluene, ethylbenzene, and xylene was not observed by Triad ES and is not included as part of Triad ES analytical report. Table 1 includes VOC results, and



Appendix G includes maps depicting the distribution of total VOCs within each zone. Based on these results, VOCs in the perched zone and lower 1,4-dioxane source area do not warrant remediation on their own and will be addressed as part of the 1,4-dioxane remedy.

### **3.4 Geotechnical Laboratory Analyses**

Soil samples from four depth intervals at SB-GX24b were collected in 2-foot-long Shelby tubes and submitted to Materials Testing Consultants, Inc. in Grand Rapids, Michigan for geotechnical analyses. The geotechnical laboratory results are provided as Appendix H and summarized below in Table 3.

**Table 3**  
**Summary of Geotechnical Results**

Sample ID	Depth (feet bgs)	Unit	USCS Description	Porosity	Vertical Hydraulic Conductivity (cm/sec)
SB-GX24b	10-12	Perched (Till)	Gray Lean Clay	0.25	2.0E-06
SB-GX24b	20-22	Perched (Till)	Gray Lean Clay	0.23	3.6E-08
SB-GX24b	70-72	Deep Overburden	Gray Lean Clay	0.33	4.1E-05
SB-GX24b	90-92	Deep Overburden/ Weathered Bedrock	Gray Silt	0.39	5.2E-05

**Notes:**

cm/sec = centimeters per second

USCS = Unified Soil Classification System

Review of Table 3 indicates the highest concentration of 1,4-dioxane observed during the study (i.e., GX-24b\_16 and GX-24\_19) are located within clay/glacial till that has a vertical hydraulic conductivity of  $10^{-6}$  cm/sec or lower. The results for the deep overburden are consistent with previous hydraulic testing results of  $10^{-5}$  cm/sec, indicating the deep saturated silt/silty sand also has a low permeability. The geotechnical results for both the perched zone and the deep overburden suggest much of the remaining mass within the lower 1,4-dioxane source area is located within low-permeability zones.

#### 4. Conclusions

The lower 1,4-dioxane source evaluation consisted of 25 soil borings completed over a 3-week period. Soil borings were completed through the shallow perched zone, intermediate vadose zone, as well as the saturated deep overburden and weathered bedrock. Soil samples from both vadose and saturated zones were collected approximately every 3 to 5 feet from the ground surface to the bedrock for quantitative on-site laboratory analysis. Conclusions from the lower 1,4-dioxane source evaluation are as follows:

- Greater than 99% of the samples analyzed on site had 1,4-dioxane concentrations less than 300 µg/Kg (the detection limit for conventional USEPA 8260 SIM analysis), indicating diffuse, limited mass remaining within the lower 1,4-dioxane source area.

##### Perched Zone:

- Perched zone impacts are limited, with the highest 1,4-dioxane concentrations located in low-permeability, dry glacial till. Only four soil samples had 1,4-dioxane concentrations greater than 1,000 µg/Kg. All four were collected at one location: SB-GX24/24b located adjacent to the south wall of the coliseum.
- The most heavily impacted soil within the perched zone occurs within the low permeability glacial till (i.e. GX-24/24b). SPLP testing of samples from this zone indicate relatively low concentrations (48 and 22 µg/L) of 1,4-dioxane in the leachate. The vertical hydraulic conductivity of the till ranges between  $10^{-6}$  and  $10^{-8}$  cm/sec suggesting limited potential for in-situ leaching. Groundwater availability within the perched zone is limited in this area. A temporary well installed at a depth of 12-19 ft bgs at SB-GX24 was dry. Only a single water bearing zone was encountered during the evaluation at a location 100' south of SB-GX24 (VAP-HH24 19.5-24.5). A sample collected from this zone indicates 1,4-dioxane at a concentration of 19.8 µg/L. Based on these results, the perched zone appears unlikely to act as a significant continuing source of 1,4-dioxane.
- The mass evaluation suggests an estimated 0.3 Kg of 1,4-dioxane remains within the perched zone.

##### Deep Overburden/Weathered Bedrock:

- Soil detections of 1,4-dioxane within the vadose zone located between the perched zone and saturated deep overburden are sporadic with a footprint similar to that of the overlying perched zone and concentrations less than 100 µg/Kg.

- Other VOCs (tetrachloroethene, dichloroethane, and 1,1,1-TCA) observed in soil coincident with the 1,4-dioxane impacts, have not been observed in groundwater samples collected from the lower 1,4-dioxane plume and will not affect the remedy proposed for the 1,4-dioxane.
- Based on the relationship between saturated soil and groundwater, the data collected during this study indicates the footprint of the lower 1,4-dioxane source area plume is smaller than previous estimates.
- The mass of 1,4-dioxane remaining within the saturated deep overburden within the general lower 1,4-dioxane source area (Figure7) is estimated to be approximately 0.6 Kg.
- The total mass of the lower 1,4-dioxane plume is estimated to be approximately 22 Kg, suggesting that 21.4 of the 22 Kg, or greater than 90%, is currently located downgradient of the lower 1,4-dioxane source area depicted on Figure 7.

The conclusions presented above suggest a lower 1,4-dioxane source mass that has been depleted, with the remaining, generally low concentration mass located within low permeability sediments. The majority of the 1,4-dioxane present in the lower 1,4-dioxane plume is currently located downgradient of the source area. The proposed remedy includes groundwater treatment and recirculation to flush the weathered bedrock zone beneath the lower 1,4-dioxane source area and within downgradient portions of the plume. Based on nature and distribution of 1,4-dioxane in the dry perched zone soils and limited potential for leaching, it is recommended that the decision to perform source remediation be made based on performance of the proposed remedy within the source area and long-term groundwater trends.



## **5. References**

ARCADIS. 2013. Resource Conservation and Recovery Act Facility Investigation Phase 2 Activities Summary Report. RACER Trust, Lansing, Michigan Plants 2, 3, and 6. April.

ARCADIS. 2014a. Corrective Measure Pre-Design Work Plan – Lower 1,4-Dioxane Source Evaluation. RACER Trust, Lansing, Michigan Plants 2, 3, and 6. June 24.

ARCADIS. 2014b. Corrective Measures Study. RACER Trust, Lansing, Michigan Plants 2, 3, and 6. June 4.

ARCADIS. 2014c. Resource Conservation and Recovery Act Facility Investigation Supplemental Phase 2 Activities Summary Report. RACER Trust, Lansing, Michigan Plants 2, 3, and 6. February 26.

Triad Environmental Solutions, Inc. 2014. Analysis of 1,4-Dioxane using Solid Phase Micro Extraction and US EPA Method 8265 Quantification.

**Tables**

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
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Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GQ26/27_3	3	3	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	768
GQ26/27_5	5	5	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	769
GQ26/27_5.5	5.5	5.5	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	770
GQ26/27_9	9	9	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	771
GQ26/27_12	12	12	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	772
GQ26/27_15	15	15	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	773
GQ26/27_18	18	18	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	774
GQ26/27_21	21	21	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	775
GQ26/27_24	24	24	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	776
GQ26/27_27	27	27	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	777
GQ26/27_30	30	30	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	778
GQ26/27_33	33	33	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	779
GQ26/27_34	34	34	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	780
GQ26/27_35	35	35	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	781
GQ26/27_38	38	38	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	782
GQ26/27_41	41	41	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	783
GQ26/27_44	44	44	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	784
GQ26/27_47	47	47	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	785
GQ26/27_50	50	50	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	786
GQ26/27_53	53	53	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	787
GQ26/27_56	56	56	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	788
GQ26/27_59	59	59	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	789
GQ26/27_62	62	62	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	790
GQ26/27_65	65	65	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	791
GQ26/27_68	68	68	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	792
GQ26/27_71	71	71	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	793
GQ26/27_73	73	73	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	794
GQ26/27_74	74	74	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	795
GQ26/27_75	75	75	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	796
GQ34_3	3	3	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	797
GQ34_6	6	6	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	798
GQ34_9	9	9	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	799
GQ34_10.5	10.5	10.5	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	800
GQ34_11	11	11	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	801
GQ34_13	13	13	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	802
GQ34_16	16	16	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	803
GQ34_19	19	19	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	804
GQ34_22	22	22	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	805
GQ34_25	25	25	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	806
GQ34_28	28	28	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	807
GQ34_31	31	31	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	808
GQ34_34	34	34	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	809
GQ34_37	37	37	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	810
GQ34_40	40	40	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	811
GQ34_43	43	43	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	812
GQ34_46	46	46	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	813
GQ34_49	49	49	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	814
GQ34_52	52	52	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	815
GQ34_55	55	55	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	816
GQ34_58	58	58	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	817
GQ34_61	61	61	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	818
GQ34_64	64	64	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	819
GQ34_67	67	67	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	820
GQ34_70	70	70	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	821
GQ34_73	73	73	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	822
GQ34_75	75	75	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	823
GT19_3	3	3	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	564
GT19_5	5	5	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	565
GT19_7	7	7	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	566
GT19_10	10	10	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	567
GT19_13	13	13	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	568
GT19_16	16	16	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	569
GT19_19	19	19	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	570
GT19_22	22	22	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	571
GT19_25	25	25	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	572
GT19_28	28	28	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.016	573
GT19_31	31	31	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	574

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GT19_34	34	34	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	575
GT19_36	36	36	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	576
GT19_39	39	39	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.018	577
GT19_40	40	40	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	578
GT19_43	43	43	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	579
GT19_46	46	46	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	580
GT19_49	49	49	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.011 J	581
GT19_52	52	52	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.012 J	582
GT19_55	55	55	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	583
GT19_58	58	58	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	584
GT19_61	61	61	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	585
GT19_64	64	64	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	586
GT19_65	65	65	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	587
GT19_68	68	68	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	588
GT19_71	71	71	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	589
GT19_74	74	74	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	590
GT19_77.5	77.5	77.5	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.011 J	591
GT19_80	80	80	Soil	7/24/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.015	592
GT24-3	3	3	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	528
GT24-5.5	5.5	5.5	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	529
GT24-7	7	7	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.028	<0.006	<0.015	530
GT24-8	8	8	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	531
GT24-8.5	8.5	8.5	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	532
GT24-10	10	10	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	533
GT24-13	13	13	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	534
GT24-15	15	15	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	535
GT24-17	17	17	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	538
GT24-20	20	20	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	539
GT24-22	22	22	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	540
GT24-25	25	25	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	541
GT24-28	28	28	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	542
GT24-29	29	29	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	543
GT24-30	30	30	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	544
GT24-31	31	31	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013 J	545
GT24-32	32	32	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	546
GT24-35	35	35	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	547
GT24-38	38	38	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	548
GT24-39	39	39	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.015	549
GT24-42	42	42	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.007 J	550
GT24-45	45	45	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	551
GT24-46	46	46	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	552
GT24-49	49	49	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	554
GT24-52	52	52	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	555
GT24-55	55	55	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.015	556
GT24-57	57	57	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	557
GT24-60	60	60	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	558
GT24-63	63	63	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	559
GT24-66	66	66	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	560
GT24-69	69	69	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	561
GT24-72	72	72	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	562
GT24-76	76	76	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	563
GT29-6	6	6	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	458
GT29-9	9	9	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	459
GT29-10	10	10	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.023	460
GT29-13	13	13	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	605
GT29-16	16	16	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	606
GT29-19	19	19	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	607
GT29-22	22	22	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	608
GT29-25	25	25	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	609
GT29-24	24	24	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	610
GT29-27	27	27	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	611
GT29-28	28	28	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	612
GT29-29	29	29	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	613
GT29-32	32	32	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	614
GT29-35	35	35	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	615
GT29-38	38	38	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	616
GT29-41	41	41	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	619

Table 1  
DSITMS USEPA Method 8265 Soil Analytical Results

Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation  
Plants 2, 3, and 6 Industrial Land  
Lansing, Michigan

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GT29-44	44	44	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	618
GT29-47	47	47	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	620
GT29-50	50	50	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	621
GT29-53	53	53	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	622
GT29-56	56	56	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	623
GT29-59	59	59	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	624
GT29-62	62	62	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	625
GT29-65	65	65	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	626
GT29-68	68	68	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.018	627
GT29-75	75	75	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	628
GT29-77	77	77	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	629
GX19-10.5	10.5	10.5	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.043	<0.006	0.034	0.012	<0.015	V347
GX19-13	13	13	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.020	<0.006	0.016	<0.006	<0.015	V348
GX19-16	16	16	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V349
GX19-19	19	19	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V350
GX19-22	22	22	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V351
GX19-25	25	25	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.055	<0.006	0.030	<0.006	<0.015	V352
GX19-28	28	28	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.019	<0.006	<0.006	<0.006	<0.015	V353
GX19-30	30	30	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V354
GX19-33	33	33	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V355
GX19-36	36	36	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V356
GX19-39	39	39	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V357
GX19-51	51	51	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V358
GX19-52	52	52	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.012 J	V359
GX19-53	53	53	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V360
GX19-55	55	55	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V361
GX19-58	58	58	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V362
GX19-58.5	58.5	58.5	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V363
GX19-61	61	61	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V364
GX19-64	64	64	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V365
GX19-67	67	67	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V366
GX19-70	70	70	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.007 J	V367
GX19-73	73	73	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.042	V368
GX19-76	76	76	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.009 J	V369
GX19_79	79	79	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V370
GX19_82	82	82	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V371
GX19_85	85	85	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V372
GX19_87	87	87	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V373
GX19_90	90	90	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V374
GX21-5	5	5	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	461
GX21-6.5	6.5	6.5	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	462
GX21-10	10	10	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.024	463
GX21-11	11	11	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	464
GX21-13	13	13	Soil	7/21/2014	mg/kg	<0.006	<0.006	0.018	<0.006	0.011	<0.006	<0.015	465
GX21-15	15	15	Soil	7/21/2014	mg/kg	<0.006	<0.006	0.167	<0.006	0.084	0.007	0.023	466
GX21-18	18	18	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.016	467
GX21-21	21	21	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	468
GX21-24	24	24	Soil	7/21/2014	mg/kg	<0.006	<0.006	0.068	<0.006	0.032	<0.006	<0.015	469
GX21-27.5	27.5	27.5	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	470
GX21-31	31	31	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	471
GX21-34	34	34	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	472
GX21-37	37	37	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	473
GX21-40	40	40	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	474
GX21-43	43	43	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	475
GX21-45	45	45	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	476
GX21-48	48	48	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	477
GX21-50	50	50	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	478
GX21-53	53	53	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	479
GX21-55	55	55	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	480
GX21-56	56	56	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	481
GX21-59	59	59	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	482
GX21-62	62	62	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	483
GX21-65	65	65	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	484
GX21-68	68	68	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.022	485
GX21-71	71	71	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.014 J	486
GX21-74	74	74	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.025	487
GX21-77	77	77	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	488

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GX21-80	80	80	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.055	489
GX21-83	83	83	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.021	490
GX21-85	85	85	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.027	491
GX21-87	87	87	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.064	492
GX21-89.5	89.5	89.5	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	493
GX24-1.5	1.5	1.5	Soil	7/17/2014	mg/kg	0.004 J	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V170
GX24-3	3	3	Soil	7/17/2014	mg/kg	0.010	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V171
GX24-6	6	6	Soil	7/17/2014	mg/kg	0.005 J	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V172
GX24-9.5	9.5	9.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.016 J	V317
GX24-12	12	12	Soil	7/17/2014	mg/kg	<0.007	<0.007	0.029	<0.007	0.054	<0.007	0.027	V318
GX24-15	15	15	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.329	V319
GX24-18	18	18	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.321	V320
GX24-21	21	21	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.076	V321
GX24-24	24	24	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.118	V322
GX24-26.5	26.5	26.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.139	V323
GX24-30	30	30	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.015 J	V324
GX24-33	33	33	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V325
GX24-36	36	36	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V326
GX24-39	39	39	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V327
GX24-42	42	42	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V329
GX24-45.5	45.5	45.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V328
GX24-48	48	48	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V330
GX24-51	51	51	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V331
GX24-54	54	54	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V332
GX24-57	57	57	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V333
GX24-60	60	60	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V334
GX24-63	63	63	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V335
GX24-66	66	66	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.006 J	V336
GX24-69	69	69	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.016 J	V337
GX24-72	72	72	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.026	V338
GX24-75	75	75	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.019	V339
GX24-77.5	77.5	77.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.016 J	V340
GX24-80	80	80	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V341
GX24-83	83	83	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V342
GX24-86	86	86	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.005 J	V343
GX24-89	89	89	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V344
GX24-92	92	92	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V345
GX24-95	95	95	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V346
GX24b_3	3	3	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	912
GX24b_6	6	6	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.162	913
GX24b_9	9	9	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	914
GX24b_13	13	13	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.118	915
GX24b_16	16	16	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	2.585	916
GX24b_19	19	19	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.973	917
GX24b_23	23	23	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.275	920
GX24b_26	26	26	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.148	918
GX24b_29	29	29	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	919
GX24b_63	63	63	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	933
GX24b_66	66	66	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	934
GX24b_69	69	69	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	935
GX24b_73	73	73	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.037	936
GX24b_76	76	76	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	937
GX24b_79	79	79	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	938
GX24b_82	82	82	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	939
GX26-4	4	4	Soil	7/18/2014	mg/kg	0.024	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V301
GX26-7	7	7	Soil	7/18/2014	mg/kg	0.025	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V302
GX26-10	10	10	Soil	7/18/2014	mg/kg	0.041	<0.006	0.013	<0.006	<0.006	<0.006	0.012 J	V303
GX26-13	13	13	Soil	7/18/2014	mg/kg	0.012	<0.006	<0.006	<0.006	<0.006	<0.006	0.006 J	V304
GX26-16	16	16	Soil	7/18/2014	mg/kg	0.015	<0.006	0.020	<0.006	0.035	0.022	<0.015	V305
GX26-19	19	19	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.093	<0.006	<0.015	V306
GX26-22	22	22	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.028	0.047	0.276	<0.006	<0.015	V307
GX26-25	25	25	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.162	0.056	0.235	<0.006	0.008 J	V308
GX26-26	26	26	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V309
GX26-27	26	26	Soil	7/18/2014	mg/kg	<0.006	<0.006	0.009	<0.006	<0.006	<0.006	0.006 J	V310
GX26-28	26	26	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.017	V311
GX26-31	31	31	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.025	V312
GX26-32	32	32	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V313

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GX26-33	33	33	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V314
GX26-37	37	37	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V315
GX26-38	38	38	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V316
GX26-39	39	39	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V389
GX26-42	42	42	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V390
GX26-43	43	43	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V391
GX26-44	44	44	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V392
GX26-45	45	45	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V393
GX26-48	48	48	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V394
GX26-51	51	51	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V395
GX26-54	54	54	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V396
GX26-57	57	57	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.010 J	V397
GX26-60	60	60	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V398
GX26-63	63	63	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V399
GX26-66	66	66	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.005 J	V400
GX26-69	69	69	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.010 J	V401
GX26-72	72	72	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.035	V402
GX26-74	74	74	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.005 J	V403
GX26-77	77	77	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.018	V404
GX26-80	80	80	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V405
GX26-83	83	83	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V406
GX26-87	87	87	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013 J	V407
GX26-89	89	89	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.018	V408
GX26-92	92	92	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	V409
GX29-3	3	3	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V256
GX29-6	6	6	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V255
GX29-9	9	9	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.011 J	V257
GX29-12	12	12	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V258
GX29-15	15	15	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V259
GX29-18	18	18	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V260
GX29-21	21	21	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V261
GX29-24	24	24	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.049	V262
GX29-24.5	24.5	24.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.050	V263
GX29-25	25	25	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.059	V264
GX29-26	26	26	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V265
GX29-29	29	29	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V266
GX29-31.5	31.5	31.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V268
GX29-32.5	32.5	32.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V267
GX29-33.5	33.5	33.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V269
GX29-35	35	35	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V270
GX29-36	35	35	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V271
GX29-37	35	35	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V272
GX29-40	40	40	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V273
GX29-41	41	41	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.005 J	V274
GX29-43	43	43	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.015 J	V275
GX29-44	44	44	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V276
GX29-47	47	47	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007 J	V278
GX29-48	48	48	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007 J	V277
GX29-49	49	49	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V279
GX29-50	50	50	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V280
GX29-51.5	51.5	51.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V281
GX29-53	53	53	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V282
GX29-56	56	56	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V283
GX29-59	59	59	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V284
GX29-62	62	62	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V285
GX29-64	64	64	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V286
GX29-66.5	66.5	66.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V287
GX29-67.5	67.5	67.5	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V288
GX29-71	71	71	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V289
GX29-74	74	74	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V290
GX29-75	75	75	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V291
GX29-78	78	78	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.012 J	V292
GX29-80	80	80	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V293
GX29-81	81	81	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V294
GX29-82	82	82	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V295
GX29-83	83	83	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.007 J	V296
GX29-84	84	84	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V297

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
GX29-87	87	87	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.010 J	V298
GX29-90	90	90	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V299
GX29-92	92	92	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V300
GX34_3	3	3	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	630
GX34_6	6	6	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	631
GX34_9	9	9	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	632
GX34_12	12	12	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	633
GX34_15	15	15	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	634
GX34_18	18	18	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	635
GX34_21	21	21	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	636
GX34_22	22	22	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	637
GX34_25	25	25	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	639
GX34_28	28	28	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	638
GX34_31	31	31	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	640
GX34_34	34	34	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	641
GX34_37	37	37	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	642
GX34_40	40	40	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	643
GX34_41	41	41	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	644
GX34_42	42	42	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	645
GX34_45	45	45	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	646
GX34_47	47	47	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	647
GX34_48	48	48	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	648
GX34_49	49	49	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	649
GX34_50	50	50	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	650
GX34_53	53	53	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	651
GX34_56	56	56	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	652
GX34_59	59	59	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	653
GX34_62	62	62	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	654
GX34_65	65	65	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	655
GX34_68	68	68	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	656
GX34_71	71	71	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	657
GX34_74	74	74	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	658
GX34_77	77	77	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	659
GX34_78	78	78	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	660
GX34_79	79	79	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	661
GX34_82	82	82	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	662
GX34_85	85	85	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	663
GX34_87	87	87	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	664
GX34_87.5	87.5	87.5	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	665
GX34_88	88	88	Soil	7/24/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	667
HA21-2	2	2	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	494
HA21-5	5	5	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	0.007	<0.017	495
HA21-6	6	6	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	496
HA21-9	9	9	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	0.005 J	<0.007	0.013 J	497
HA21-11	11	11	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	0.054	<0.007	<0.017	498
HA21-14	14	14	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	499
HA21-19	19	19	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	500
HA21-21	21	21	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	501
HA21-25.5	25.5	25.5	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	502
HA21-29	29	29	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.013 J	503
HA21-32	32	32	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	504
HA21-35	35	35	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	505
HA21-37.5	37.5	37.5	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	506
HA21-40	40	40	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	507
HA21-43	43	43	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	508
HA21-45	45	45	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	509
HA21-48	48	48	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	510
HA21-51	51	51	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	511
HA21-54	54	54	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	512
HA21-56	56	56	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	513
HA21-59	59	59	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.017	514
HA21-63	63	63	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	514
HA21-66	66	66	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	516
HA21-69	69	69	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	517
HA21-72	72	72	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.005 J	518
HA21-75	75	75	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.012 J	519
HA21-78	78	78	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.048	520

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HA21-80	80	80	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.016	521
HA21-83	83	83	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	522
HA21-86	86	86	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	523
HA21-89	89	89	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008 J	524
HA21-92	92	92	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.018	525
HA21-93	93	93	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	526
HA21-95	95	95	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	527
HA24-8	8	8	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	410
HA24-11	11	11	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	375
HA24-14	14	14	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	376
HA24-17	17	17	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	377
HA24-20	20	20	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	378
HA24-23	23	23	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	379
HA24-26	26	26	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	380
HA24-29	29	29	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	381
HA24-32	32	32	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	382
HA24-35	35	35	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.016	383
HA24-38	38	38	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	384
HA24-41	41	41	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	385
HA24-44	44	44	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	386
HA24-45	45	45	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	411
HA24-46	46	46	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.044	413
HA24-49	49	49	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.105	412
HA24-52	52	52	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	388
HA24-55	55	55	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.061	424
HA24-58	58	58	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	423
HA24-61	61	61	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	421
HA24-64	64	64	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	422
HA24-67	67	67	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	420
HA24-70	70	70	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.110	419
HA24-73	73	73	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.058	387
HA24-76	76	76	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.031	414
HA24-79	79	79	Soil	7/21/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.017	415
HA24-82	82	82	Soil	7/21/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.047	416
HA24-85	85	85	Soil	7/21/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	417
HA24-88	88	88	Soil	7/21/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	418
HA24-91	91	91	Soil	7/21/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	435
HA24-94	94	94	Soil	7/21/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	436
HA26-3	3	3	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	425
HA26-6	6	6	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	426
HA26-11	11	11	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	427
HA26-20	20	20	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	428
HA26-23	23	23	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	429
HA26-26	26	26	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	430
HA26-29	29	29	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	431
HA26-32	32	32	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	432
HA26-35	35	35	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.024	433
HA26-38	38	38	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	434
HA26-40	40	40	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	438
HA26-42	42	42	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	439
HA26-45	45	45	Soil	7/22/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	440
HA26-46	46	46	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	437
HA26-47	47	47	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	443
HA26-49	49	49	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.014 J	441
HA26-50	50	50	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.017	442
HA26-53	53	53	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.016	444
HA26-55	55	55	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	445
HA26-58	58	58	Soil	7/22/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	446
HA26-61	61	61	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	447
HA26-64	64	64	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	448
HA26-67	67	67	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	449
HA26-70	70	70	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006 J	450
HA26-73	73	73	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.025	451
HA26-76	76	76	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008 J	452
HA26-79	79	79	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	453
HA26-82	82	82	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	454
HA26-85	85	85	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.005 J	455

**Table 1  
DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation  
Plants 2, 3, and 6 Industrial Land  
Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HA26-88	88	88	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.011 J	456
HA26-91	91	91	Soil	7/23/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.015	457
HC14_12	12	12	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	734
HC14_15	15	15	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	735
HC14_18	18	18	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	736
HC14_21	21	21	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	737
HC14_24	24	24	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	738
HC14_27	27	27	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	739
HC14_30	30	30	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	740
HC14_33	33	33	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	741
HC14_36	36	36	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	742
HC14_39	39	39	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	743
HC14_42	42	42	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	744
HC14_45	45	45	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	745
HC14_48	48	48	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	746
HC14_51	51	51	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	747
HC14_54	54	54	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	748
HC14_57	57	57	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	857
HC14_60	60	60	Soil	7/29/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	858
HC14_63	63	63	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	859
HC14_66	66	66	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	860
HC14_69	69	69	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	861
HC14_72	72	72	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	865
HC14_75	75	75	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	863
HC14_78	78	78	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	864
HC14_81	81	81	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	866
HC14_84	84	84	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	867
HC14_87	87	87	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	868
HC14_90	90	90	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	869
HC14_93	93	93	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	870
HC14_96	96	96	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	871
HC19-2	2	2	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V134
HC19-5	5	5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V135
HC19-8.85	8.85	8.85	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V136
HC19-11	11	11	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V137
HC19-14	14	14	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V138
HC19-17	17	17	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V139
HC19-20	20	20	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V140
HC19-23	23	23	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V141
HC19-26	26	26	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V142
HC19-29	29	29	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V143
HC19-32	32	32	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V144
HC19-35	35	35	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V145
HC19-38	38	38	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V146
HC19-41	41	41	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V147
HC19-44	44	44	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V148
HC19-47	47	47	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V149
HC19-50	50	50	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V150
HC19-53	53	53	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V151
HC19-56	56	56	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V153
HC19-59.5	59.5	59.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.004 J	V154
HC19-62	62	62	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.027	V155
HC19-65	65	65	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.022	V156
HC19-68	68	68	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.008 J	V157
HC19-71	71	71	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V158
HC19-74	74	74	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V159
HC19-77	77	77	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V160
HC19-80	80	80	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V161
HC19-81.25	81.25	81.25	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V162
HC19-81.75	81.75	81.75	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.005 J	V163
HC19-82	82	82	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V164
HC19-85	85	85	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.009 J	V165
HC19-88	88	88	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.015	V166
HC19-91	91	91	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V167
HC19-94	94	94	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V168
HC19-95	95	95	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V169
HC24_2	2	2	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.024	<0.006	<0.15	V101

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HC24_5	5	5	Soil	7/14/2014	mg/kg	0.007	<0.006	<0.006	<0.006	0.009	0.050	<0.15	V102
HC24_8	8	8	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.041	0.046	<0.15	V103
HC24_11	11	11	Soil	7/14/2014	mg/kg	<0.006	<0.006	0.092	<0.006	0.197	0.216	<0.15	V104
HC24_14	14	14	Soil	7/14/2014	mg/kg	<0.006	<0.006	0.005 J	<0.006	<0.006	<0.006	<0.15	V105
HC24_17	17	17	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.010 J	V106
HC24_19.25	19.25	19.25	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.077	<0.006	0.006 J	V107
HC24_19.5	19.5	19.5	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.061	<0.006	0.008 J	V108
HC24_19.75	19.5	19.5	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.056	<0.006	<0.15	V109
HC24_23	23	23	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013 J	V110
HC24_26	26	26	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.012 J	V111
HC24_29	29	29	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V112
HC24_32	32	32	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V113
HC24_35	35	35	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V114
HC24_38	38	38	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V115
HC24-50	50	50	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V116
HC24-55	55	55	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V117
HC24-57	57	57	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.007 J	V118
HC24-59	59	59	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.041	V119
HC24-62	62	62	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V120
HC24-65	65	65	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V121
HC24-68	68	68	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013 J	V122
HC24_71	71	71	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V123
HC24_74	74	74	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.027	V124
HC24_77	77	77	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.009 J	V125
HC24_80	80	80	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008 J	V126
HC24-83	83	83	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.020	V127
HC24-83.9	83.9	83.9	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.014 J	V128
HC24-87	87	87	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V129
HC24-90	90	90	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.003 J	V130
HC24-92	92	92	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.012 J	V131
HC24-93.5	93.5	93.5	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V132
HC24-95	95	95	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V133
HC29-3	3	3	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.009 J	V218
HC29-4.5	4.5	4.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V219
HC29-12	12	12	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V220
HC29-15	15	15	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V221
HC29-18	18	18	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V222
HC29-21	21	21	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V223
HC29-21.5	21.5	21.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V224
HC29-22.5	22.5	22.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V225
HC29-26	26	26	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.008 J	V226
HC29-29	29	29	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V227
HC29-29.5	29.5	29.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V229
HC29-32	32	32	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V228
HC29-34	34	34	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V230
HC29-34.5	34.5	34.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V231
HC29-35	35	35	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V232
HC29-38	38	38	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V233
HC29-41	41	41	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V234
HC29-44	44	44	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V235
HC29-44.5	44.5	44.5	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V237
HC29-45	45	45	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.006 J	V236
HC29-46	46	46	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V238
HC29-49	49	49	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V239
HC29-50	50	50	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V240
HC29-51	51	51	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V241
HC29-52	52	52	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V242
HC29-55	53	53	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V243
HC29-61	61	61	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V244
HC29-64	64	64	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V245
HC29-67	67	67	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	NA	V246
HC29-70	70	70	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V247
HC29-73	73	73	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.021	V248
HC29-76	76	76	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.022	V249
HC29-79	79	79	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.037	V250
HC29-82	82	82	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.025	V251
HC29-85	85	85	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.008 J	V252

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HC29-88	88	88	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.006 J	V253
HC29-89	89	89	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V254
HH19_3	3	3	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	666
HH19_6	6	6	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	668
HH19_9	9	9	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	672
HH19_12	12	12	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	669
HH19_15	15	15	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	670
HH19_18	18	18	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	671
HH19_21	21	21	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	673
HH19_24	24	24	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	674
HH19_27	27	27	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	675
HH19_30	30	30	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	676
HH19_33	33	33	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	677
HH19_36	36	36	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	678
HH19_37	37	37	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	681
HH19_39	39	39	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	679
HH19_42	42	42	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	682
HH19_45	45	45	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	683
HH19_46	46	46	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.010 J	684
HH19_47	47	47	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	686
HH19_49	49	49	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	685
HH19_52	52	52	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	687
HH19_55	55	55	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	688
HH19_58	58	58	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.006 J	689
HH19_61	61	61	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.023	690
HH19_64	64	64	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.033	691
HH19_67	67	67	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.006 J	692
HH19_70	70	70	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.010 J	693
HH19_73	73	73	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	694
HH19_76	76	76	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	695
HH19_77	77	77	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	696
HH19_79	79	79	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	697
HH19_82	82	82	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	680
HH19_85	85	85	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	698
HH19_88	88	88	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	699
HH19_91	91	91	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	700
HH19_94	94	94	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	701
HH24-4	4	4	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V173
HH24-7	7	7	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V174
HH24-9	9	9	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V176
HH24-9.5	9.5	9.5	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.014 J	V175
HH24-10	10	10	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V177
HH24-13	13	13	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V178
HH24-16	16	16	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V179
HH24-19	19	19	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V180
HH24-21	21	21	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V181
HH24-22	22	22	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V182
HH24-23	23	23	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V183
HH24-24	24	24	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.007 J	V184
HH24-27	27	27	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.006 J	V185
HH24-30	30	30	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.035	V186
HH24-33	33	33	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V187
HH24-36	36	36	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.008 J	V188
HH24-39	39	39	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V189
HH24-42	42	42	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V191
HH24-43	42	42	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V190
HH24-44	42	42	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V192
HH24-47	47	47	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V193
HH24-48	48	48	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V195
HH24-49	49	49	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V194
HH24-50	50	50	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V196
HH24-53	53	53	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V197
HH24-53.5	53.5	53.5	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.15	V198
HH24_54	54	54	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V199
HH24_54.5	54.5	54.5	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V200
HH24_57	57	57	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V202
HH24_59	59	59	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V201

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HH24_62	62	62	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V203
HH24_64	64	64	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V204
HH24_65	65	65	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.015	V205
HH24_68	68	68	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.011 J	V206
HH24_72	72	72	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V208
HH24_74	74	74	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.010 J	V207
HH24_77	77	77	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V209
HH24_80	80	80	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V210
HH24_81	81	81	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V211
HH24_82	82	82	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.017	V213
HH24_85	85	85	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.006 J	V212
HH24_90	90	90	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.018	V214
HH24_91	91	91	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.017	V217
HH24_93	93	93	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	0.008 J	V215
HH24_94	94	94	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.017	V216
HH29_3	3	3	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	702
HH29_6	6	6	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	703
HH29_9	9	9	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	704
HH29_12	12	12	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	705
HH29_15	15	15	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	706
HH29_18	18	18	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	707
HH29_21	21	21	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	708
HH29_24	24	24	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	709
HH29_27	27	27	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	710
HH29_33	33	33	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	712
HH29_36	36	36	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	713
HH29_39	39	39	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	714
HH29_42	42	42	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	715
HH29_45	45	45	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	716
HH29_48	48	48	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	717
HH29_51	51	51	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	718
HH29_53	53	53	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	719
HH29_53.5	53.5	53.5	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	720
HH29_54	54	54	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	721
HH29_57	57	57	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	722
HH29_60	60	60	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	723
HH29_63	63	63	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.022	724
HH29_66	66	66	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	725
HH29_69	69	69	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	726
HH29_72	72	72	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.019	727
HH29_75	75	75	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.027	728
HH29_78	78	78	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	729
HH29_81	81	81	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.027	730
HH29_84	84	84	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.025	731
HH29_87	87	87	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.017	732
HH29_90	90	90	Soil	7/28/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.017	733
HH34_3	3	3	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	824
HH34_6	6	6	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	825
HH34_9	9	9	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	826
HH34_12	12	12	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	827
HH34_15	15	15	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	828
HH34_18	18	18	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	829
HH34_21	21	21	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	830
HH34_24	24	24	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	831
HH34_27	27	27	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	832
HH34_30	30	30	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	833
HH34_33	33	33	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	834
HH34_36	36	36	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	835
HH34_39	39	39	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	836
HH34_42	42	42	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	837
HH34_45	45	45	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	838
HH34_48	48	48	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	839
HH34_51	51	51	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	840
HH34_54	54	54	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	841
HH34_57	57	57	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.011 J	842
HH34_60	60	60	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	843
HH34_63	63	63	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	844

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HH34_66	66	66	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	845
HH34_69	69	69	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	846
HH34_72	72	72	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.012 J	847
HH34_75	75	75	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.016	848
HH34_78	78	78	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.012 J	849
HH34_81	81	81	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	850
HH34_84	84	84	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	851
HH34_86	86	86	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.018	852
HH34_89	89	89	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.020	853
HH34_92	92	92	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.016	854
HH34_94	94	94	Soil	7/31/2014	mg/kg	NA	NA	NA	NA	NA	NA	0.016	855
HM14_3	3	3	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	872
HM14_6	6	6	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	873
HM14_9	9	9	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	874
HM14_12	12	12	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	875
HM14_15	15	15	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	876
HM14_18	18	18	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	877
HM14_21	21	21	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	878
HM14_22	22	22	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	879
HM14_23	23	23	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	880
HM14_26	26	26	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	881
HM14_29	29	29	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	882
HM14_32	32	32	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	883
HM14_35	35	35	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	884
HM14_38	38	38	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	885
HM14_41	41	41	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	886
HM14_44	44	44	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	887
HM14_47	47	47	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	888
HM14_50	50	50	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	889
HM14_53	53	53	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	890
HM14_56	56	56	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	891
HM14_59	59	59	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	892
HM14_62	62	62	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	900
HM14_65	65	65	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	901
HM14_68	68	68	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	902
HM14_71	71	71	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	903
HM14_74	74	74	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	904
HM14_77	77	77	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	905
HM14_80	80	80	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	906
HM14_83	83	83	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	907
HM14_86	86	86	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	908
HM14_89	89	89	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	909
HM14_92	92	92	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	910
HM14_95	95	95	Soil	7/30/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	911
HM24_2	2	2	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	593
HM24_5	5	5	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	594
HM24_8	8	8	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	595
HM24_11	11	11	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	596
HM24_14	14	14	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	597
HM24_17	17	17	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	598
HM24_20	20	20	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	599
HM24_21	21	21	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	600
HM24_24	24	24	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	601
HM24_28	28	28	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	602
HM24_31.5	31.5	31.5	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	604
HM24_34	34	34	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	749
HM24_37	37	37	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	750
HM24_40	40	40	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	751
HM24_43	43	43	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	752
HM24_46	46	46	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	753
HM24_49	49	49	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	754
HM24_52	52	52	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	755
HM24_55	55	55	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	756
HM24_56	56	56	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	757
HM24_61	61	61	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	758
HM24_64	64	64	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	759
HM24_67	67	67	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	760

**Table 1**  
**DSITMS USEPA Method 8265 Soil Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane	Vial #
HM24_70	70	70	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	761
HM24_73	73	73	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	762
HM24_76	76	76	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	763
HM24_79	79	79	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	764
HM24_82	82	82	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	765
HM24_85	85	85	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	766
HM24_87	87	87	Soil	7/25/2014	mg/kg	NA	NA	NA	NA	NA	NA	<0.015	767

**Notes:**

< = less than

mg/kg = milligrams per kilogram

J = Estimated. Value detected at concentration below method detection limit

1,1-DCA = 1,1-dichloroethane

1,1,1-TCA = 1,1,1-trichloroethane

1,2-DCA = 1,2-dichloroethane

DCE = dichloroethene

DSITMS = direct sampling ion trap mass spectrometer

NA = not analyzed

PCE = tetrachloroethene

TCE = trichloroethene

USEPA = United States Environmental Protection Agency

VC = vinyl chloride

**Table 2**  
**DSITMS USEPA Method 8265 Groundwater Analytical Results**

**Corrective Measure Pre-Design Report - Lower 1,4-Dioxane Source Evaluation**  
**Plants 2, 3, and 6 Industrial Land**  
**Lansing, Michigan**

Sample Name	Depth Begin	Depth End	Sample Type	Date Sampled	Units	PCE	TCE	DCE	VC+1,2-DCA	1,1-DCA	1,1,1-TCA	1,4-Dioxane
VAP-HH24 (19.5-24.5)	19.5	24.5	Aqueous	7/14/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	19.8
VAP-HH24-(90-95)	90	95	Aqueous	7/15/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	60.5
VAP-HC19-(90-95)	90	95	Aqueous	7/16/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	23.2
VAP-HC24-(90-95)	90	95	Aqueous	7/16/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	17.1
VAP-HC29-(85-90)	85	90	Aqueous	7/17/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	56.2
VAP-GX24-(90-95)	90	95	Aqueous	7/17/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.6 J
VAP-GX29-(87-92)	90	95	Aqueous	7/17/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.7 J
VAP-GX19-(85-90)	85	90	Aqueous	7/18/2014	µg/L	<2.0	<2.0	<2.0	<2.0	2.7	<2.0	8.7
VAP-HM14-(90-95)	90	95	Aqueous	7/30/2014	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<5.0

**Notes:**

< = less than

µg/L = micrograms per liter

J = Estimated. Value detected at concentration below method detection limit

1,1-DCA = 1,1-dichloroethane

1,1,1-TCA = 1,1,1-trichloroethane

1,2-DCA = 1,2-dichloroethane

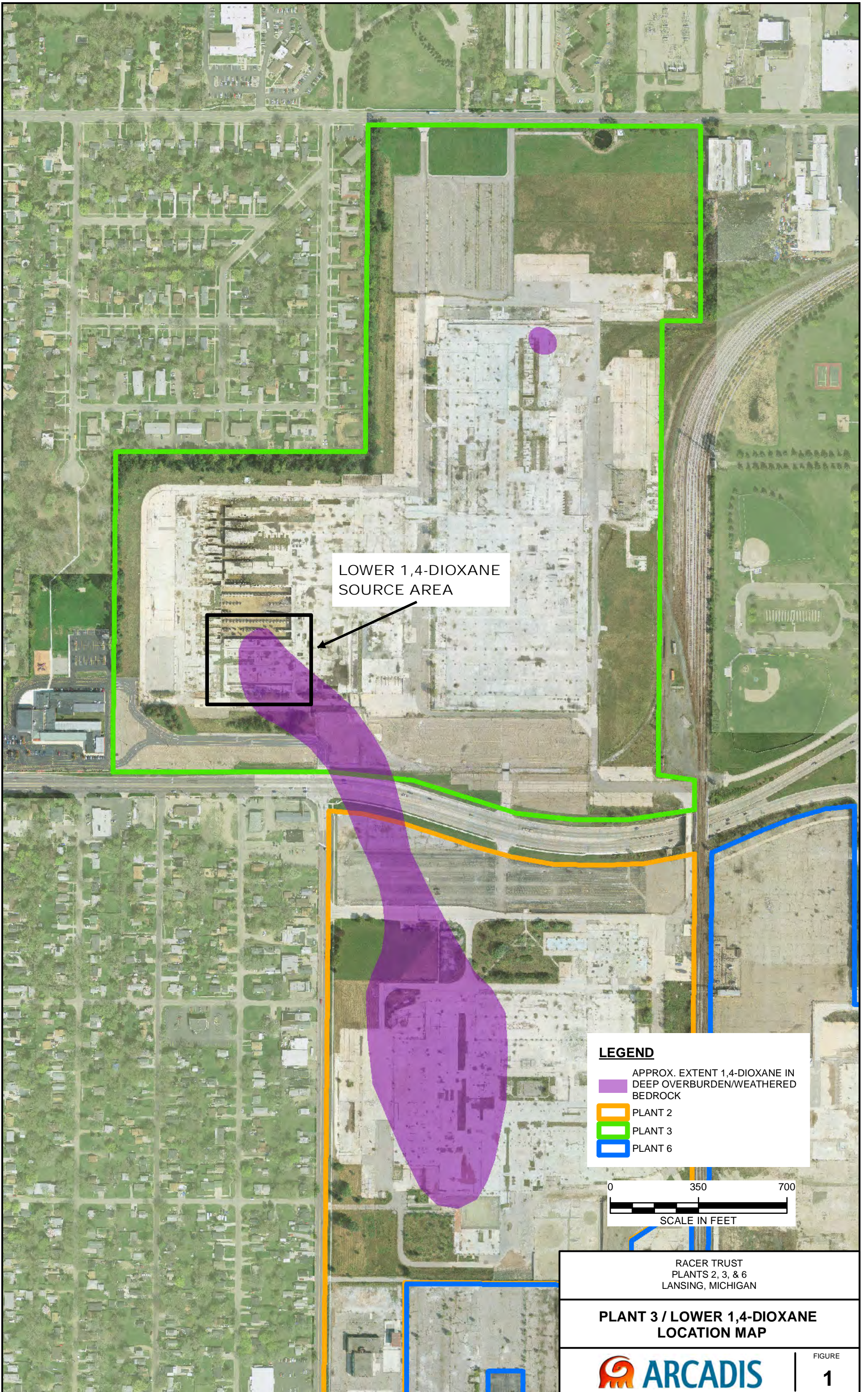
DCE = dichloroethene

PCE = tetrachloroethene

TCE = trichloroethene





VC = vinyl chloride

**Figures**



LOWER 1,4-DIOXANE  
SOURCE AREA

**LEGEND**

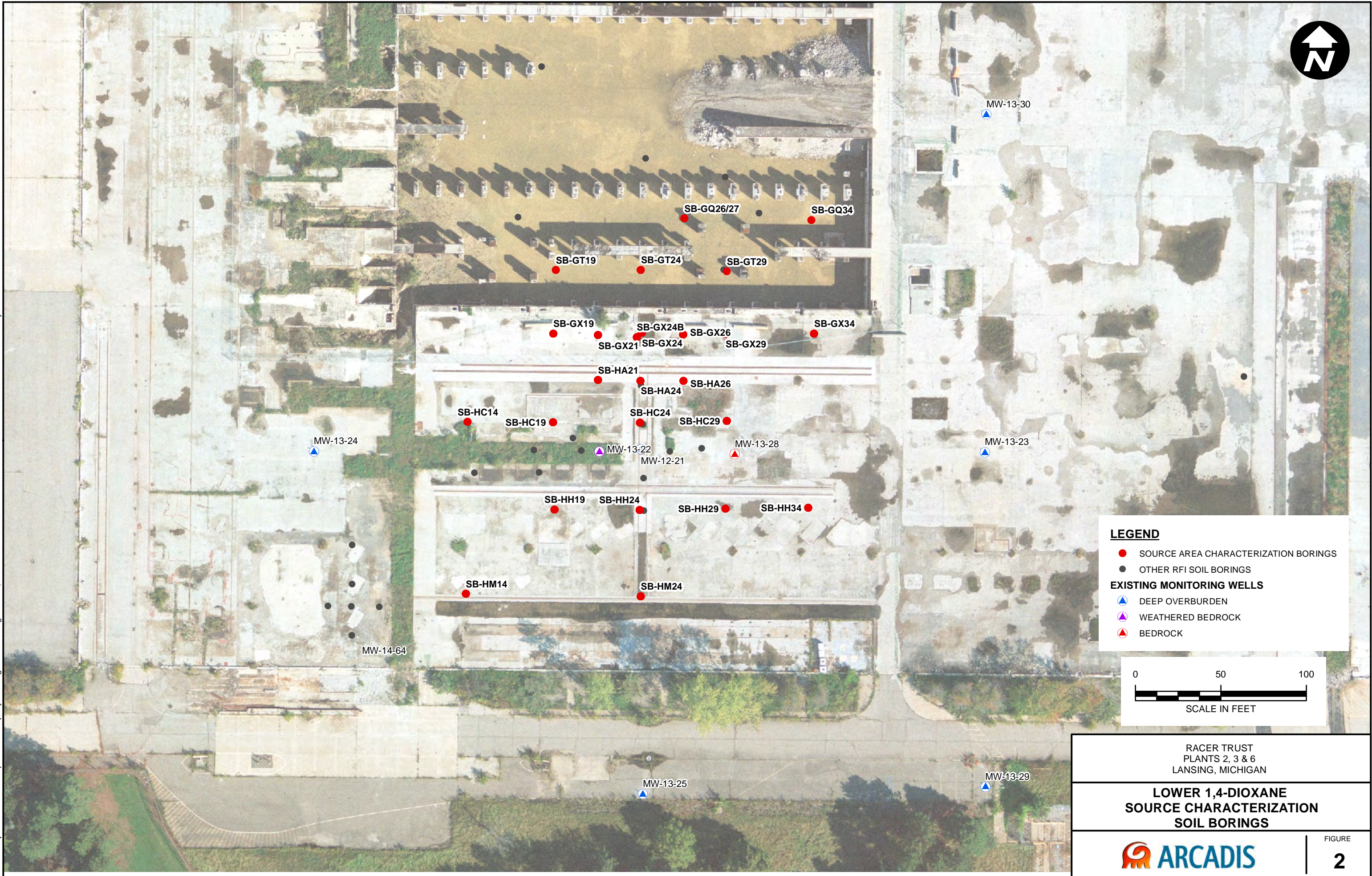
-  APPROX. EXTENT 1,4-DIOXANE IN DEEP OVERBURDEN/WEATHERED BEDROCK
-  PLANT 2
-  PLANT 3
-  PLANT 6

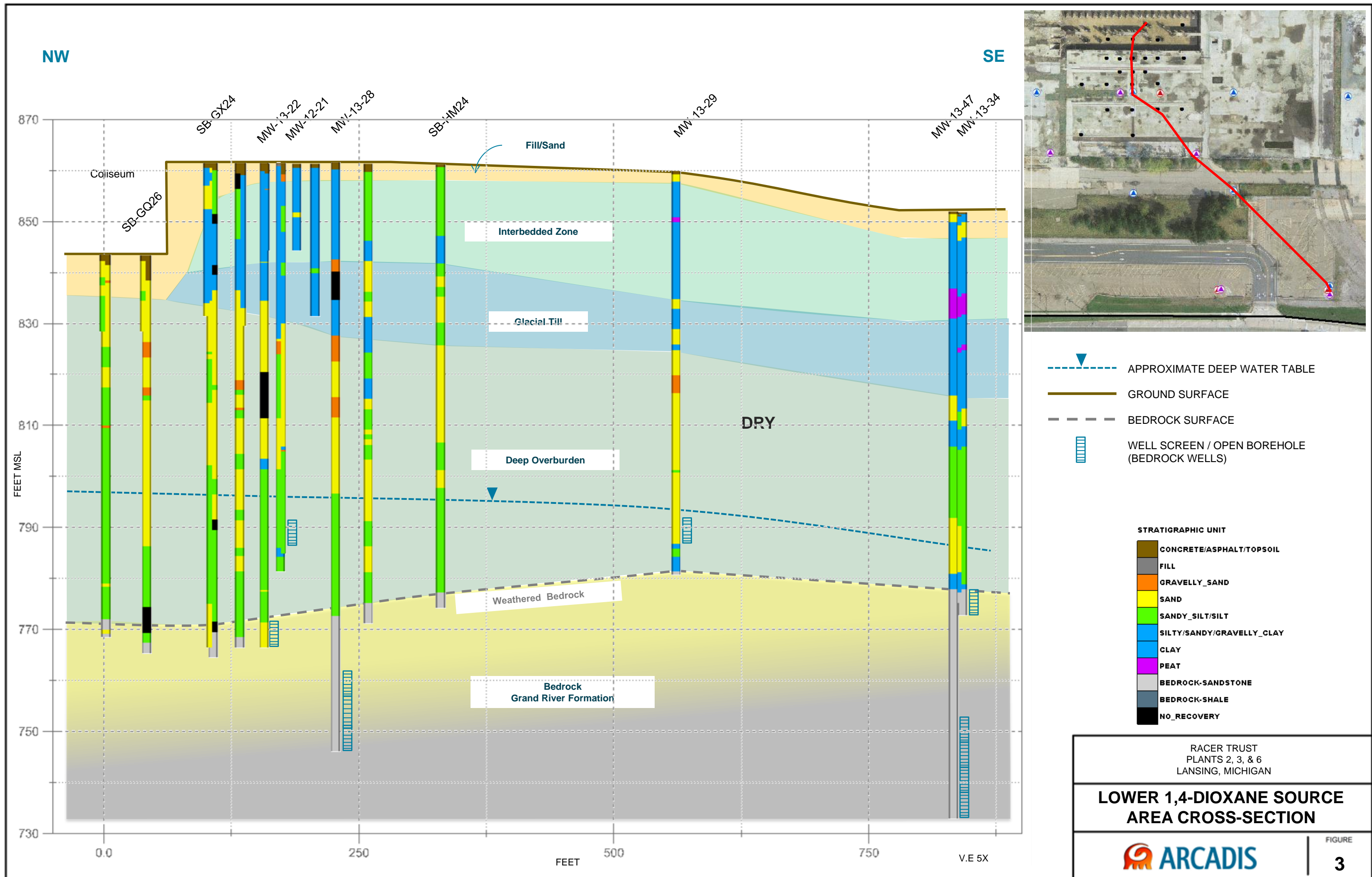


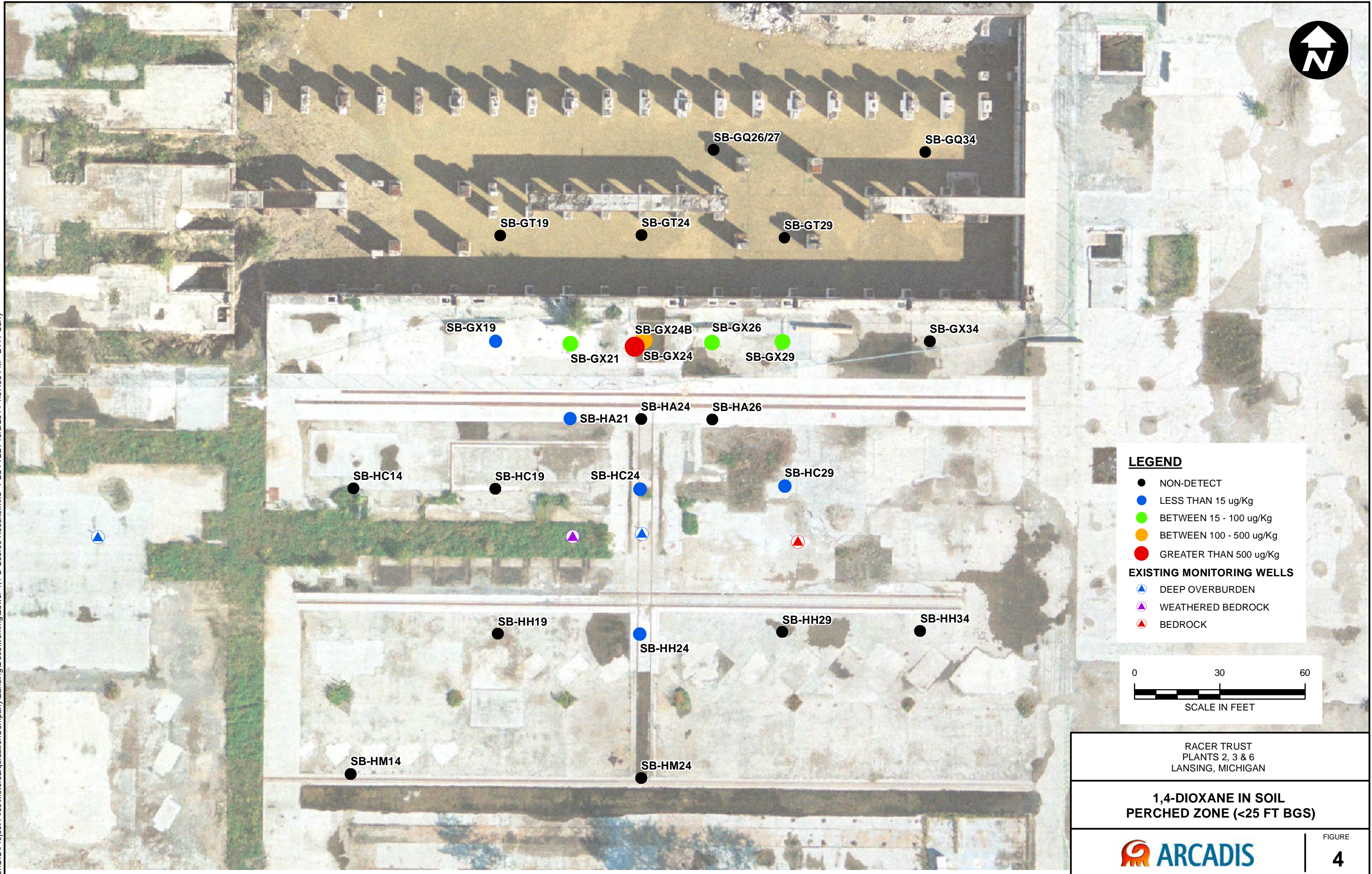
RACER TRUST  
PLANTS 2, 3, & 6  
LANSING, MICHIGAN

**PLANT 3 / LOWER 1,4-DIOXANE  
LOCATION MAP**







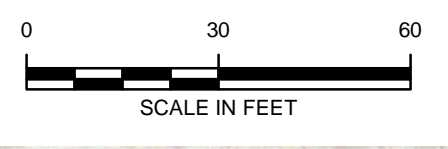


**LEGEND**

- NON-DETECT
- LESS THAN 15 ug/Kg
- BETWEEN 15 - 100 ug/Kg
- BETWEEN 100 - 500 ug/Kg
- GREATER THAN 500 ug/Kg

**EXISTING MONITORING WELLS**

- ▲ DEEP OVERBURDEN
- ▲ WEATHERED BEDROCK
- ▲ BEDROCK

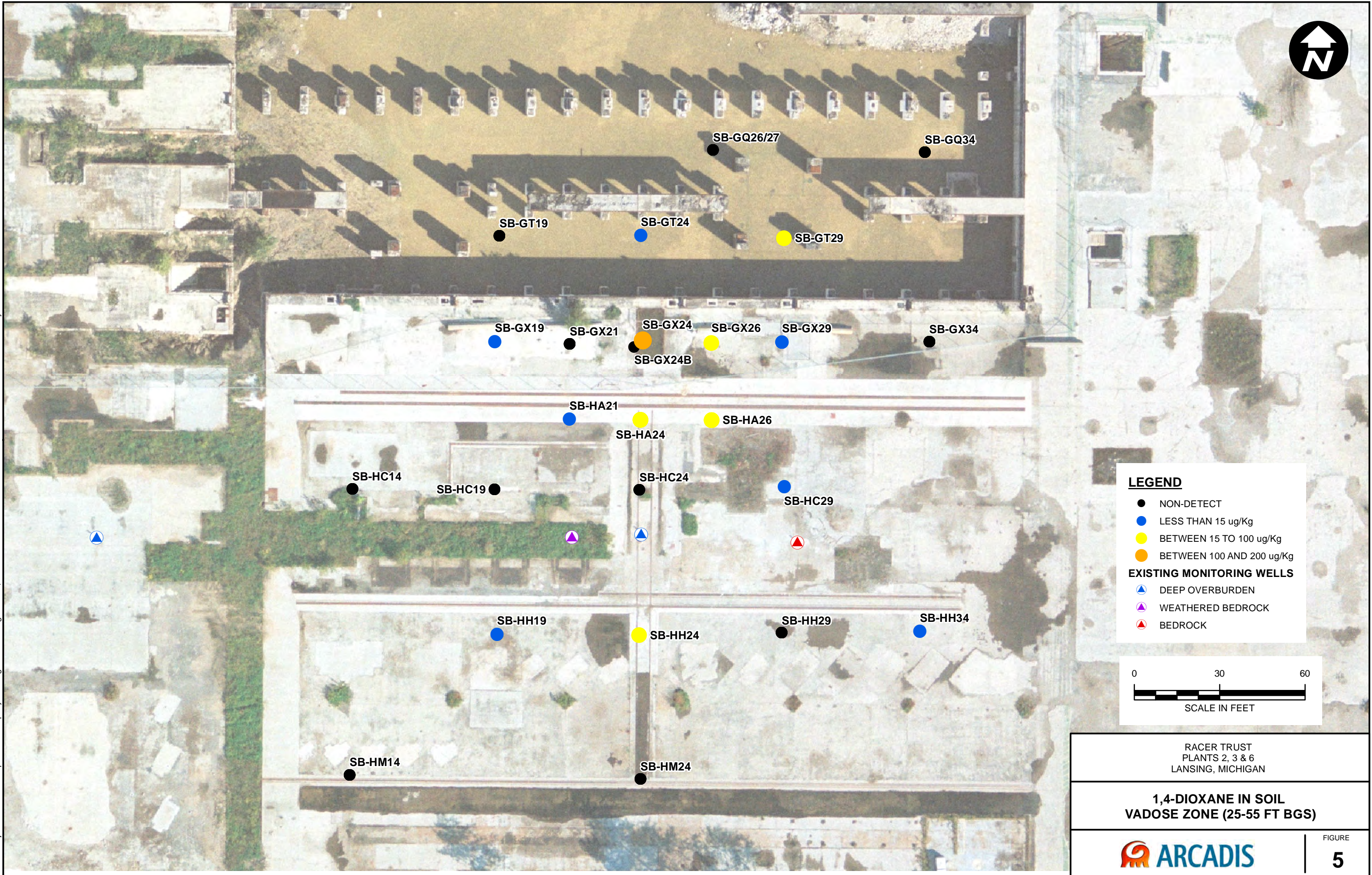


RACER TRUST  
 PLANTS 2, 3 & 6  
 LANSING, MICHIGAN

**1,4-DIOXANE IN SOIL  
 PERCHED ZONE (<25 FT BGS)**

**ARCADIS**

FIGURE  
**4**

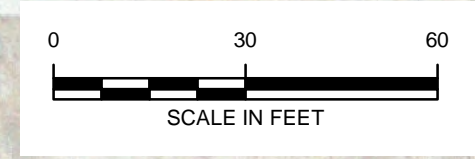


**LEGEND**

- NON-DETECT
- LESS THAN 15 ug/Kg
- BETWEEN 15 TO 100 ug/Kg
- BETWEEN 100 AND 200 ug/Kg

**EXISTING MONITORING WELLS**

- ▲ DEEP OVERBURDEN
- ▲ WEATHERED BEDROCK
- ▲ BEDROCK

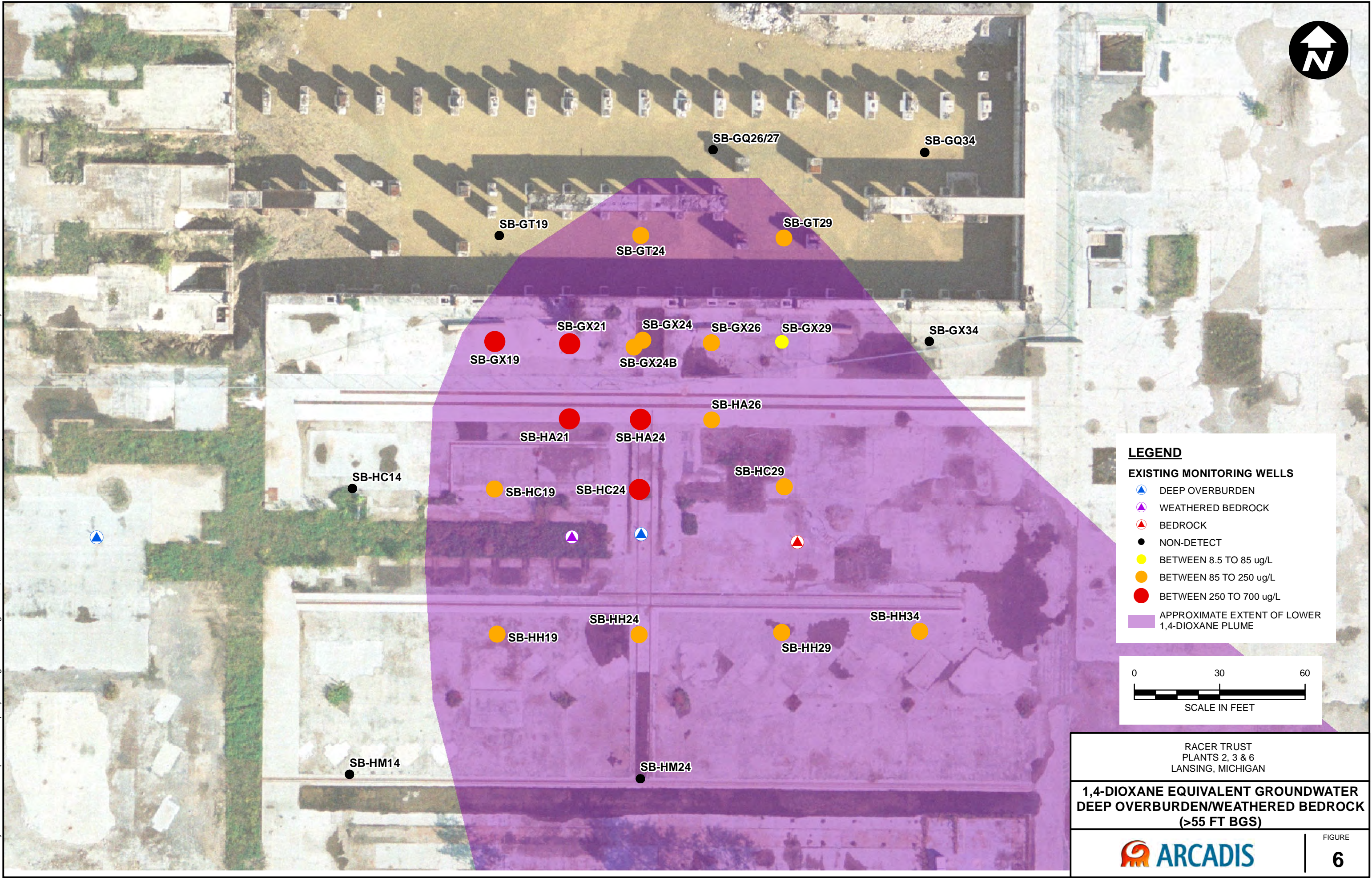


RACER TRUST  
 PLANTS 2, 3 & 6  
 LANSING, MICHIGAN

**1,4-DIOXANE IN SOIL  
 VADOSE ZONE (25-55 FT BGS)**

**ARCADIS**

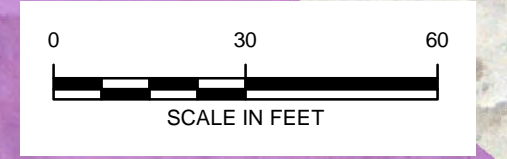
FIGURE  
**5**



**LEGEND**

**EXISTING MONITORING WELLS**

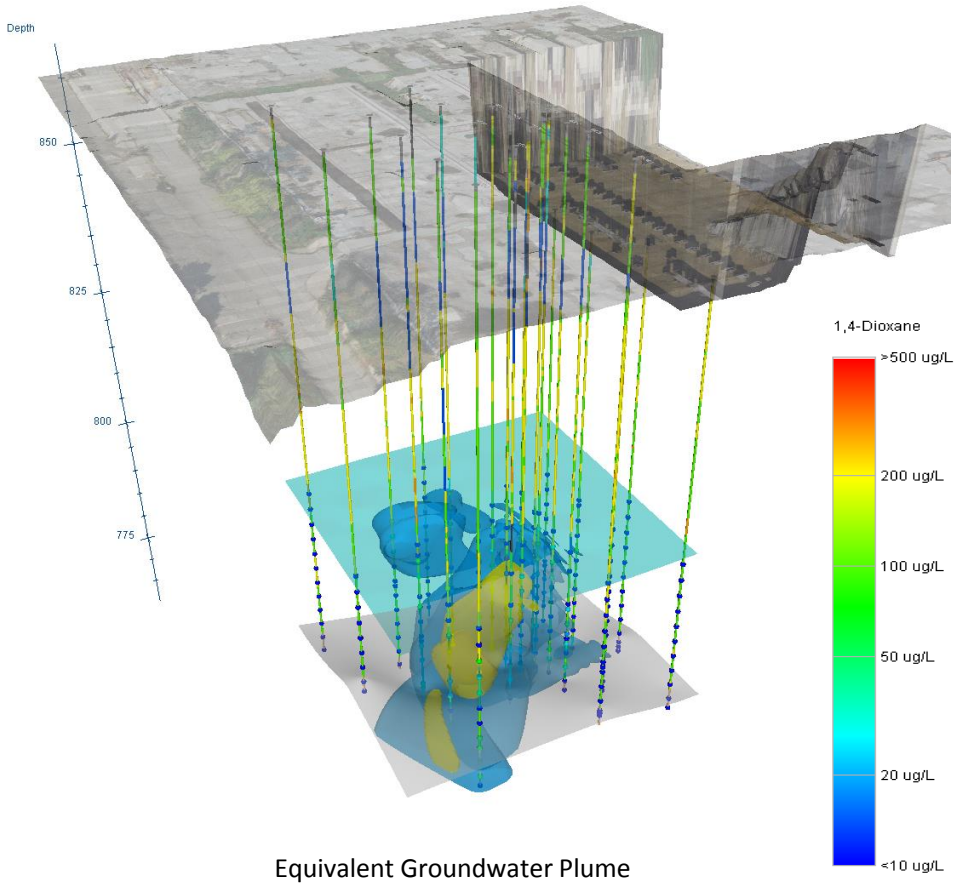
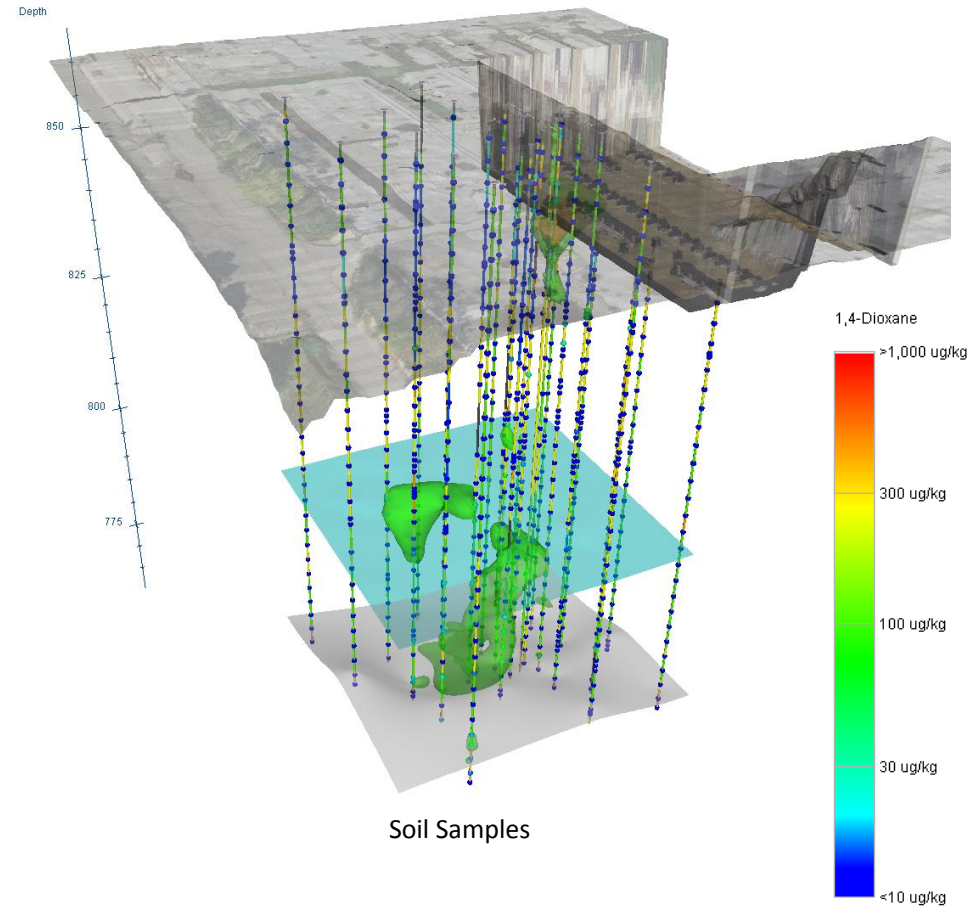
- ▲ DEEP OVERBURDEN
- ▲ WEATHERED BEDROCK
- ▲ BEDROCK
- NON-DETECT
- BETWEEN 8.5 TO 85 ug/L
- BETWEEN 85 TO 250 ug/L
- BETWEEN 250 TO 700 ug/L
- APPROXIMATE EXTENT OF LOWER 1,4-DIOXANE PLUME



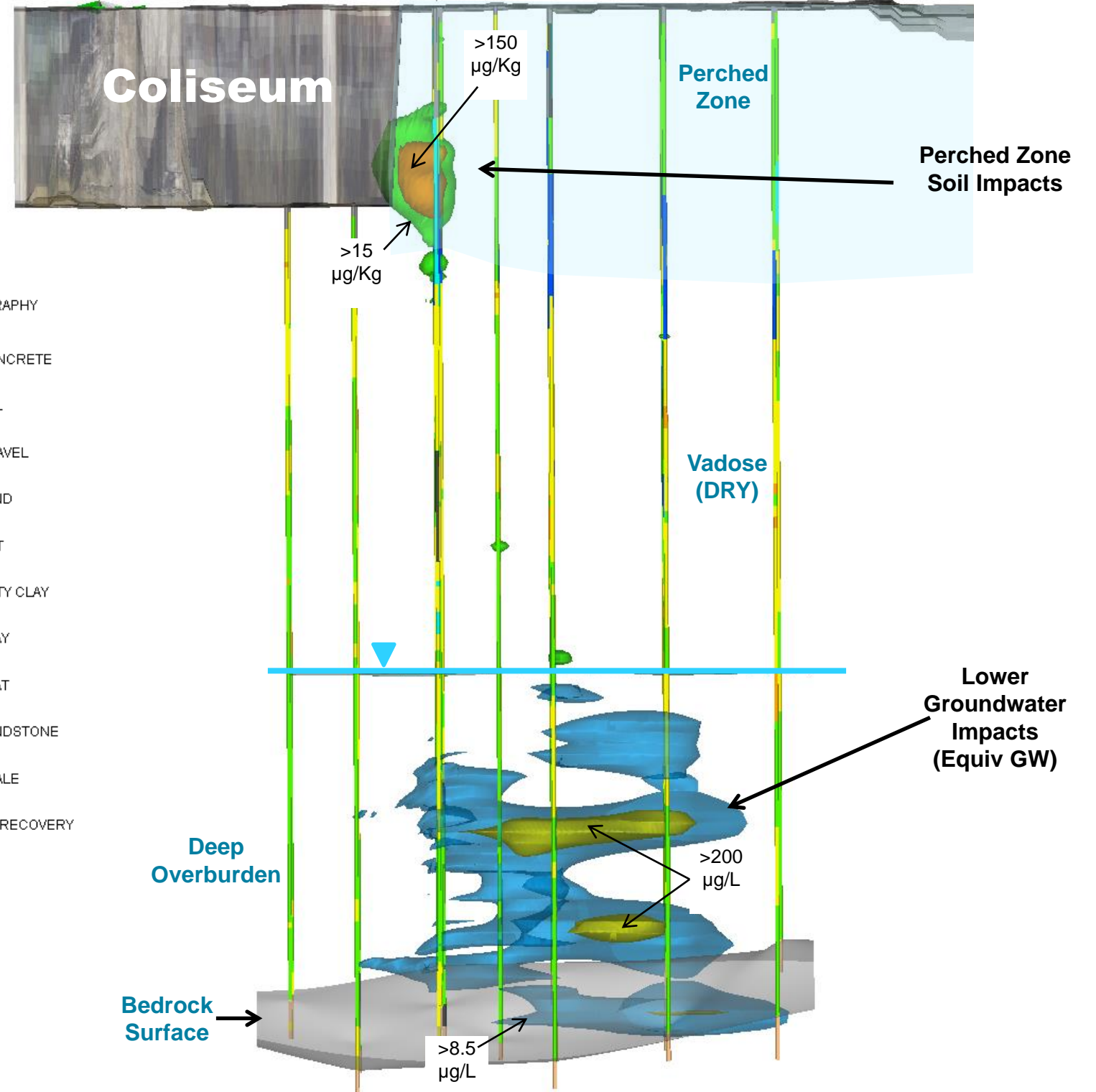
RACER TRUST  
 PLANTS 2, 3 & 6  
 LANSING, MICHIGAN

**1,4-DIOXANE EQUIVALENT GROUNDWATER  
 DEEP OVERBURDEN/WEATHERED BEDROCK  
 (>55 FT BGS)**

**Looking Northwest**



**Looking East**



RACER TRUST  
 PLANTS 2, 3, & 6  
 LANSING, MICHIGAN

**LOWER 1,4-DIOXANE SOURCE  
 AREA 3D MODEL**

ARCADIS

FIGURE  
**7**



## **Appendix A**

Summary of Field Activities

## Appendix A – Summary of Field Methods

### 1. Sonic Drilling

Twenty-five soil borings were completed across the source area using two sonic drill rigs. Borings were spaced either 25 or 50 feet apart in a grid pattern as illustrated on Figure 2 of the *Corrective Measure Pre-Design Report – Lower 1,4-Dioxane Source Evaluation* (report). Total depth of the soil borings was typically 90 to 95 feet and all were advanced to bedrock. Soil samples from both vadose and saturated zones were collected approximately every 3 to 5 feet for on-site analysis by Triad Environmental Solutions, Inc. of Durham, North Carolina (Triad ES). Overburden and bedrock were logged and described in accordance with the Soil Description Standard Operating Procedures included with the Michigan Department of Environmental Quality- (MDEQ-) approved *Field Sampling Plan* (ARCADIS 2011). All borings were continuously screened using a photoionization detector suited for screening volatile organic compounds (VOCs). Appendix B of the report includes boring logs generated based on the field descriptions.

Depth-discrete groundwater samples were collected from nine of the bore holes using a temporary well assembly. The temporary well screen was approximately 5 feet long and 2 inches in diameter. Intervals were selected from permeable zones within areas of known soil or groundwater impacts.

Upon review of the on-site analytical results from the 25 soil borings, a monitoring well was installed adjacent to SB-GX24/24b where the highest concentrations of 1,4-dioxane were observed. The monitoring well was installed using sonic drilling methods. The intended purpose of the temporary well was to determine if water is present within the impacted portion of the perched zone and could be sampled for comparison to the synthetic precipitate leaching procedure (SPLP) data. However, the monitoring well has remained dry since installation, indicating groundwater within the impacted zone is limited.

### 2. On-Site Laboratory Analyses

Soil and groundwater samples were provided to Triad ES to perform rapid, on-site analyses of 1,4-dioxane and VOCs. The Triad ES 1,4-dioxane analysis method is based on solid-phase micro extraction (SPME) followed by mass spectrometric analysis using the direct sampling ion trap mass spectrometer (DSITMS) (Triad ES 2014). This method has been demonstrated to provide quantitative analysis of 1,4-dioxane to detection limits of 1 to 2 micrograms per liter ( $\mu\text{g/L}$ ) for groundwater and 5 to 8 micrograms per kilogram ( $\mu\text{g/Kg}$ ) for soil samples.

The DSITMS method also provides quantitative analysis of most VOCs to detection limits of 2  $\mu\text{g/L}$  for groundwater and 15  $\mu\text{g/Kg}$  for soil. The majority of samples were analyzed for a site-specific list of VOCs. If compounds are present for which the DSITMS has not been quantitatively calibrated, the mass spectra of the new compounds can be used qualitatively to identify them. Once new VOCs have been detected, the DSITMS can then be calibrated for their analysis. For example, other compounds of interest for the Site, such as benzene, toluene, ethylbenzene, xylenes (BTEX), and acetone, were not detected and only site-specific chlorinated compounds of interest were reported. VOCs analyses were eliminated after the second week, based on the limited extent of the VOC distribution.

## **2.1 On-Site Soil Analyses**

Soil samples were typically collected at nominal 3-foot intervals, adjusted based on the observed stratigraphy. Once collected, soil samples were immediately given to Triad ES. Initially, the samples were analyzed for select VOCs and 1,4-dioxane using the DSITMS. Due to the sporadic occurrence downgradient of the source area, BTEX was monitored during analysis and not observed; therefore, BTEX was not included as part of the Triad ES analytical report. The 1,4-dioxane soil samples were prepared using SPME. As the study progressed, VOC analysis was eliminated and the soil samples were only analyzed for 1,4-dioxane. During the site evaluation, more than 800 soil samples were collected and analyzed for 1,4-dioxane and more than 500 soil samples were analyzed for VOCs. Table 1 of the report summarizes DSITMS soil analytical data collected during this event.

## **2.2 On-Site Groundwater Analyses**

Groundwater samples were collected from permeable zones encountered during drilling. The majority of samples were collected from the weathered bedrock. Once collected, groundwater samples were immediately given to Triad ES. All samples, except one, were analyzed for select VOCs and 1,4-dioxane using DSITMS. The groundwater sample from SB-HM14 was only analyzed for 1,4-dioxane. Table 2 of the report summarizes DSITMS groundwater analytical data collected during this event.

## **2.3 DSITMS Quality Assurance/Quality Control**

The mobile laboratory performed quality assurance/quality control (QA/QC) checks (sample blank, continuing calibration check, performance check, matrix spike, and duplicate analysis) for every 20 samples analyzed, at a minimum, according to their internal QA/QC program. Acceptance criteria for the mobile laboratory included the following:

- 30% (+/-) for analysis of continuing calibration check standards and externally purchased performance check standards
- 30% (+/-) for matrix spike analyses
- 30% relative percent difference for duplicate analyses
- Results less than the method detection limit for blank analyses

Appendix C of the report provides mobile laboratory QA/QC sample results for VOCs and 1,4-dioxane. The results of the QA/QC program indicate the acceptance criteria were met.

## **3. Off-Site Fixed Laboratory Analyses – Soil**

Soil samples from select intervals were submitted to Merit Analytical Laboratory (Merit) for 1,4-dioxane, VOCs, SPLP, and fraction of organic carbon (FOC) analyses. Appendix E of the report includes the analytical reports from Merit. Each of the fixed laboratory soil analyses are discussed in greater detail below.

### 3.1 1,4-Dioxane by USEPA Method 8260-SIM

A subset of the soil samples analyzed on site for 1,4-dioxane by DSITMS were also analyzed off site by a fixed-base laboratory. During the course of the field activities, three different types of soil samples were analyzed off site for 1,4-dioxane. Tables summarizing the off-site laboratory data and compared to the equivalent Triad ES data are included as Appendix D of the report. Appendix D also includes a graphical comparison of the various Merit and Triad ES data. Off-site analysis using United States Environmental Protection Agency (USEPA) Method 8260-SIM was completed on the following types of samples:

1. Collocated samples in 40-milliliter (mL) methanol-preserved vials (300 µg/Kg reporting limit). This is the designated analytical method for 1,4-dioxane in soil (MDEQ 2004).
  - All the methanol-preserved samples submitted for USEPA Method 8260-SIM analysis were collected from SB-GX24b, as this was the only location where concentrations determined by the DSITMS were greater than 300 µg/Kg.
  - Samples where 1,4-dioxane was expected to be below 300 µg/Kg were analyzed using unpreserved samples outlined below.
2. Collocated samples from 4-ounce unpreserved glass jars (3 µg/Kg reporting limit).
  - Subsamples from the 4-ounce jars were analyzed for 1,4-dioxane using heated headspace extraction and USEPA Method 8260-SIM. These results provide another comparison to the on-site DSITMS results, for the range of concentrations between 3 to 300 µg/Kg. These analyses were also required for low concentration samples submitted for SPLP testing.
  - These results indicated variability due to soil heterogeneity and, therefore, extract samples were submitted to provide a true comparison of analytical methods.
3. Aqueous extracts – extract samples that were split from the samples analyzed by Triad ES on site and provided to Merit for analysis of 1,4-dioxane.
  - Due to the heterogeneous nature of soil, duplicate samples collected close to one another (e.g., less than 0.5 feet) may provide sample results that are different even when analyzed using the same analytical method. Splits of the sample extracts were utilized to eliminate this sampling bias and provide a more accurate assessment of the DSITMS method.

There is a strong correlation and acceptable agreement between the methods, indicating the DSITMS 1,4-dioxane soil data is of sufficient quality to support the intended decisions of the study.

### 3.2 Volatile Organic Compounds by USEPA Method 8260

Soil samples were collected into methanol-preserved 40-mL vials consistent with USEPA Method 5035 sampling protocols and submitted to Merit for VOCs analysis by USEPA Method 8260. The results were then compared to the VOC concentrations determined on site. Note that sampling bias was introduced because the samples had to be collected into separate 40-mL vials for the on-site and off-site analyses.



This bias was minimized to the extent possible by having the sample syringes collocated during sampling. Appendix D of the report provides soil VOC concentrations as determined off site.

### **3.3 Synthetic Precipitation Leaching Procedure by USEPA Method SW1312**

SPLP testing is used to estimate the site-specific potential for soil contamination to impact groundwater (New Jersey Department of Environmental Protection [NJDEP] 2013). Four samples from the perched zone and eight samples from the vadose zone and deep overburden were submitted for SPLP testing. Appendix D of the report provides a summary of the SPLP laboratory testing results. For weakly sorbed compounds, such as 1,4-dioxane, SPLP methods will under-predict field leachate concentrations (NJDEP 2013). Therefore, corrected field leachate concentrations were calculated using the NJDEP SPLP Spreadsheet, Version 3.1. The NJDEP SPLP spreadsheet output is included as Attachment 1. Of the 12 samples analyzed, only two had detectable leachate concentrations (corrected values of 48 and 22 µg/L) and these were both from the perched zone (Samples GX-24b\_16 & GX-24b\_19). These samples were collected from the dense, dry glacial till zone consistent with the zone of highest of 1,4-dioxane concentration observed during the evaluation.

### **3.4 Fraction of Organic Carbon by Walkley-Black Method**

Soil samples from two locations were submitted to Merit for FOC analysis. Appendix D of the report provides a summary of the FOC laboratory testing results. An average FOC was calculated for three different soil types/depth zones: (1) predominantly clay soils in the perched zone, (2) saturated deep overburden sand/silt mixtures, and (3) weathered sandstone. The average FOC was 0.90% in the deep overburden, 0.35% in the perched zone, and 0.24% in the weathered sandstone.

## **4. Fixed Laboratory Groundwater Analyses**

Groundwater samples from six of the nine locations that were analyzed on site were also analyzed off site by Merit. The 1,4-dioxane and VOCs groundwater analyses are discussed separately as follows. Appendix E of the report include the analytical reports from Merit.

### **4.1 1,4-Dioxane by USEPA Method 8260-SIM**

During groundwater sampling with the temporary well assembly, samples were collected for on-site laboratory analysis. Appendix D of the report provides a comparison of the 1,4-dioxane groundwater concentrations as determined on site and off site. There is a strong correlation and acceptable agreement between the methods. The DSITMS 1,4-dioxane groundwater data are of sufficient quality to support the intended decisions of this study.

### **4.2 Volatile Organic Compounds by USEPA Method 8260**

All of the groundwater samples submitted to Merit were also analyzed for VOCs by USEPA Method 8260, except for VAP-SB-HM14 (90 to 95 feet). Appendix D of the report provides groundwater VOC concentrations as determined off site.

## 5. Geotechnical Laboratory Analyses

Soil samples from four depth intervals at SB-GX24b were collected into 2-foot-long Shelby tubes and submitted to Materials Testing Consultants, Inc. in Grand Rapids, Michigan for geotechnical analyses. These analyses included:

- Laboratory Determined Density, American Society for Testing and Materials (ASTM) D7263
- Moisture Content, ASTM D2216
- Specific Gravity, ASTM D854
- Hydraulic Conductivity by Flex-Wall Permeameter, ASTM D5084
- Permeability of Granular Soils (Constant Head), ASTM D2434

A summary of the geotechnical testing results is provided in Appendix H and Table 3 of the report. The samples were classified as either inorganic clays of low to medium plasticity (CL) or inorganic silts and very fine sands (ML) using the Unified Soil Classification System. Porosity ranged from 25 to 39%. Hydraulic conductivity ranged from  $3.6 \times 10^{-8}$  to  $2.0 \times 10^{-6}$  centimeters per second (cm/sec) in the perched zone and from  $4.1 \times 10^{-5}$  to  $5.2 \times 10^{-5}$  cm/sec in the deep overburden/weathered bedrock. These data were used to develop site-specific soil-water partitioning values. The low permeabilities measured within the most heavily impacted zone (GX24b) are consistent with the idea of a depleted source zone where significant mass only remains within the lowest conductivity storage zones.

## 6. References

ARCADIS. 2011. Field Sampling Plan. RACER Trust, Lansing, Michigan. Plants 2, 3, and 6. August 26.

Michigan Department of Environmental Quality (MDEQ). October 22, 2004. RRD Operational Memorandum No. 2. Sampling and Analysis – Attachment 1.

New Jersey Department of Environmental Protection (NJDEP). November 2013. Development of Site-Specific Impact to Ground Water Soil Remediation Standards Using the Synthetic Precipitation Leaching Procedure. Version 3.0.

Triad Environmental Solutions, Inc. 2014. Analysis of 1,4-Dioxane using Solid Phase Micro Extraction and USEPA Method 8265 Quantification.



**Attachment 1**

**CALCULATE SITE RESULTS**

Reset

Print Results

Instructions

Case name/area of concern: 1,4-Dioxane Source Area/Coliseum  
 Case number:  
 Sampling date:

Print to file

Exit

Contaminant: 1,4-Dioxane  
 CAS No: 123-91-1  
 Water solubility (mg/L): 1.00E+06  
 Aqueous reporting limit (µg/L): 5.00E+00  
 Soil reporting limit (mg/kg): 3.00E-03  
 Health-based GWQC (µg/L): 8.50E+01  
 DAF (20, or site-specific if approved): 1  
 Leachate Criterion (µg/L): 8.50E+01  
 Henry's law constant (dimensionless): 1.96E-04

enter NA if inorganic  
 if unavailable, enter a value below lowest concentration measured  
 enter 0 if inorganic

**NOTE:**  
**USE ONE PAGE PER CONTAMINANT, do not leave empty rows between samples**  
**Do not enter samples with soil concentrations at or below the reporting limit.**  
**When leachate concentration is non-detect, enter the aqueous reporting limit**  
**Enter site-specific dilution-attenuation factor (DAF) if desired**  
 Data entry cells (do not skip rows)  
 Optional data entry  
 Calculated or locked cells  
 Indicates that Alternative Remediation Standard needs to be recalculated

Sample ID	Soil sample weight (kg)	Leachate Volume (L)	Total Soil Concentration (mg/kg)	SPLP Leachate Concentration (µg/L)	Final pH of Leachate (except VOCs)	Optional data				Kd (L/kg)	% Contaminant in Leachate	Field leachate concentration (µg/L)	Pass or fail?
						Sampling Depth (ft)	Soil Type	Organic Carbon (mg/kg)	Organic Carbon (%)				
SB-GX24b_73ft	0.025	0.5	0.04	1						20.0	50.00	1.00	PASS
SB-GX24b_19ft	0.025	0.5	2	18						91.1	18.00	21.91	PASS
SB-GX24b_16ft	0.025	0.5	2.8	36						57.8	25.71	48.33	PASS

Note: Leachate concentration for SB-GX24b\_73 ft was non-detect.

**SPLP RESULTS for**

**OPTION 1a: All adjusted leachate concentrations are below the leachate criterion**

**REMEDIATION STANDARD = 2.8 mg/kg**

**OPTION 1b: Simple inspection of tabulated results to find highest acceptable standard**  
 EVERYTHING PASSED, OPTION 1b NOT VALID

**OPTION 2: Remediation standard using site-specific Kd value**  
 Kd ratio = 4.56, AVERAGING Kds OK  
 Kd USED FOR CALCULATING STANDARD = 56.3 L/kg  
 result before rounding = 4.7982 mg/kg  
**REMEDIATION STANDARD = 3 mg/kg (controlled by maximum soil concentration)**

**OPTION 3: Remediation standard using linear regression**  
 Number of points = 2  
 (points were eliminated because leachate concentrations were not above the aqueous reporting limit)  
 Less than three points with leachate concentrations above the aqueous reporting limit  
 LINEAR REGRESSION CANNOT BE CONDUCTED



**Appendix B**

Boring Logs

<b>Date Start:</b> 7/28/2014 <b>Date Finish:</b> 7/28/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 75.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GQ26/27  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 67 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	4.6	NA			(0.0'-2.0') CONCRETE; and concrete fill.		
					0.0			(2.0'-4.5') SAND, medium to very fine; trace granules to small pebbles, subround; well sorted; slightly moist; yellow brown (10YR 5/4).		
					0.9	X				
					3.1			(4.5'-5.0') SAND, fine to very fine; dry; very well sorted; very dark gray (10YR 3/1).		
5	-5				17.0	X		(5.0'-5.5') SAND, coarse to fine; and PEBBLES, medium, subround; little silt; poorly sorted; moist; dark gray (10YR 3/3). NOTE: Fill.		
		2	5.0-10.0	4.8	15.7			(5.5'-18.0') SAND, fine to very fine; some silt; well sorted; slightly moist; yellow brown (10YR 5/4).		
					15.4					
					14.3					
					13.4	X				
10	-10				12.1					
		3	10.0-15.0	4.10	14.2					
					17.5	X				
					17.9					
					18.1					
15	-15				19.0	X				
					15.9					

**Remarks:** bgs = below ground surface  
No groundwater encountered.  
No odor or staining observed.



<b>Date Start:</b> 7/28/2014 <b>Date Finish:</b> 7/28/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 75.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GQ26/27  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 67 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	4.8	14.6	X	[Pattern]	(18.0'-22.0') SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT, slow dilatancy; well sorted; slightly moist; medium stiff; light olive brown (2.5Y 5/3).		
								15.1		
25	-25	5	20.0-25.0	5.0	12.9	X	[Pattern]	(22.0'-26.0') SAND, medium to very fine; trace granules to medium pebbles, subround; some silt, slow dilatancy; soft to medium stiff; light olive brown (2.5Y 5/3).		
					15.2					
					13.1					
					13.6					
30	-30	6	25.0-30.0	4.9	12.0	X	[Pattern]	(26.0'-33.5') SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT, slow dilatancy; slightly moist; medium stiff; grayish brown (2.5Y 5/2).		
					12.1					
					13.2					
					14.7					
35	-35	7	30.0-35.0	4.10	12.4	X	[Pattern]	(33.5'-34.0') SAND, coarse to fine; and PEBBLES, medium, subround; little silt; poorly sorted; moist; dark gray brown (2.5Y 4/2).		
					8.1					
					12.7					
					13.0					
					9.7	X	[Pattern]	(34.0'-36.0') SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT, trace clay, low plasticity, slow dilatancy; slightly moist; medium stiff; dark gray brown (10YR 4/2).		
					--		[Pattern]	(36.0'-64.5') SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT, some clay, low plasticity, slow dilatancy; poorly sorted; slightly moist; medium stiff; dark gray brown (10YR 4/2).		

**Remarks:** bgs = below ground surface  
No groundwater encountered.  
No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 75.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GQ26/27  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction									
40	-40	8	35.0-40.0	5.0	10.0	×	[Dotted Pattern]												
					--	×													
					12.1	×													
45	-45	9	40.0-45.0	4.9	9.9	×	[Dotted Pattern]												
					--	×													
					12.3	×													
50	-50	10	45.0-50.0	4.4	10.9	×	[Dotted Pattern]												
					8.0	×													
					--	×													
55	-55	11	50.0-55.0	4.7	15.0	×	[Dotted Pattern]												
					--	×													
					16.9	×													
					10.4	×	[Dotted Pattern]												
					--	×													
					13.7	×													
					17.0	×	[Dotted Pattern]												
					--	×													
					11.1	×													

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 75.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GQ26/27  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 67 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	55.0-60.0	4.10	--	X				
					15.0	X				
					10.9	X				
					0.5					
		13	60.0-65.0	4.6	--	X				
					2.7	X				
					--					
					14.5	X		(64.5'-65.0') SAND, coarse to fine; trace granules to small to medium pebbles, subround; little silt; moist; dark gray brown (10YR 4/2).		
					4.4	X		(65.0'-71.5') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, trace clay, low plasticity, slow dilatancy; medium stiff to stiff; moist; brown (10YR 4/3).		
		14	65.0-70.0	4.5	--	X				
					8.9	X				
					--					
					8.7	X				
70	-70				--	X				
					3.5	X		(71.5'-73.5') BEDROCK, weathered sandstone, very large pebbles, subround; and SAND, fine to very fine; some silt, slow dilatancy; trace granules to medium to large pebbles, subround; slightly moist; light brownish gray (10YR 6/2).		
		15	70.0-75.0	4.7	--	X				
					3.1	X		(73.5'-74.25') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, trace clay, low plasticity, slow dilatancy; slightly moist; medium stiff to stiff; brown (10YR 4/3).		
					5.9	X		(74.25'-75.0') Bedrock, weathered sandstone, very large pebbles, subround; and SAND, fine to very fine; trace granules (foreign) to large pebbles, subround; slightly moist; gray (10YR 6/1).		
75	-75							End of boring at 75.0' bgs.		

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/29/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 75.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GQ34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 67 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	4.4	NA			(0.0'-0.5') CONCRETE.		
						X		(0.5'-5.0') SAND, medium to fine; little granules to very large pebbles, subround; some clay, medium plasticity; slightly moist; dark yellow brown (10YR 4/6).		
5	-5	2	5.0-10.0	4.8		X		(5.0'-10.0') SAND, medium to very fine; trace granules to medium pebbles, subround; some silt, slow dilatancy; well sorted; slightly moist; medium stiff; yellowish brown (10YR 5/4).		
						X		(10.0'-10.5') SAND, coarse to fine; and PEBBLES, very large, subround; little silt; poorly sorted; slightly moist; brown (7.5YR 4/3).		
10	-10					X		(10.5'-11.0') SILT, little clay, nonplastic, slow dilatancy; and SAND, very fine; dry to moist; very stiff to hard; light yellowish brown (2.5YR 6/3).		
		3	10.0-15.0	4.8		X		(11.0'-18.0') SAND, medium to very fine; trace granules to medium pebbles, subround; some silt, slow dilatancy; well sorted; slightly moist; medium stiff; yellowish brown (10YR 5/4).		
						X				
15	-15					X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed.
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**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 75.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GQ34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	4.10	--	X	(18.0'-21.5')	SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, trace clay, low plasticity, slow dilatancy; stiff; dry to moist; stiff; light olive brown (2.5YR 5/3).		
		5	20.0-25.0	4.6	--	X	(21.5'-24.0')	SAND, medium to very fine; trace granules to large pebbles, subround; little silt, slow dilatancy; dry to slightly moist; medium stiff; grayish brown (2.5YR 5/2).		
25	-25	6	25.0-30.0	4.7	--	X	(24.0'-37.5')	SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT; slow dilatancy; medium stiff; light brownish gray (2.5YR 6/2).		
30	-30	7	30.0-35.0	--	--	X				
35	-35				0.2	X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 75.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GQ34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	-	--	X	[Symbol]	(37.5'-40.5') SAND, coarse to fine; and PEBBLES, medium to large, subround; little to trace silt; dry to slightly moist; gray (2.5YR 5/1).		
45	-45	9	40.0-45.0	5.0	--	X	[Symbol]	(40.5'-62.5') SAND, fine to very fine; trace granules to medium to large pebbles, subround; and SILT, little to trace clay, medium to low plasticity, slow dilatancy; dry to slightly moist; medium stiff to stiff; gray (5Y 5/1).  NOTE: Change in granule size, trace granules to small pebbles, subround at 44.0' bgs.		
50	-50	10	45.0-50.0	5.0	--	X	[Symbol]			
55	-55	11	50.0-55.0	4.10	--	X	[Symbol]			

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 75.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GQ34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 67 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	55.0-60.0	5.0	--	X				
					0.7					
		13	60.0-65.0	4.7	--	X		(62.5'-64.0') SAND, coarse to very fine; little granules to medium pebbles, subround; little silt; moist; dark gray brown (10YR 4/2).		
					--			(64.0'-69.0') SAND, fine to very fine; and SILT, little to trace clay, low to medium plasticity, slow dilatancy; stiff; brown (10YR 4/3).		
65	-65				0.1	X				
		14	65.0-70.0	4.6	--	X				
					--					
					0.4	X		(69.0'-71.0') BEDROCK, weathered sandstone, large pebbles, subround; and SAND, fine to very fine; little silt, slow dilatancy; trace granules (foreign) to medium to large pebbles, subround; slightly moist; light brownish gray (10YR 6/2).		
70	-70				--	X				
		15	70.0-75.0	--	--	X		(71.0'-75.0') BEDROCK, weathered sandstone, very large pebbles, subround; and SAND, fine to very fine; trace granules (foreign) to medium to large pebbles, subround; slightly moist; gray (10YR 6/1).		
					--	X				
					0.8	X				
75	-75							End of boring at 75.0' bgs.		

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 80.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GT19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA			(0.0'-1.0') CONCRETE.		
					24.6			(1.0'-5.0') SAND, fine to very fine; trace granules to small cobbles, subround; and SILT, trace clay, nonplastic to low dilatancy; dry to moist; medium stiff to stiff; gray brown (10YR 4/2). NOTE: Fill.		
					11.7	X				
					12.4	X				
					7.6	X		(5.0'-5.5') PEBBLES, medium, subround to round; some very fine to fine sand; some silt; gray brown (10YR 4/2). NOTE: Fill; trace metal fragments.		
5	-5	2	5.0-10.0	4.10	30.8	X		(5.5'-7.5') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT, very slow dilatancy; dry to moist; medium stiff to stiff; gray brown (10YR 4/2).		
					23.7	X				
					9.9	X		(7.5'-15.5') SAND, coarse to fine, subround; little granules to medium pebbles, subround; little silt; dry to moist; brown (10YR 5/3).		
					12.9					
					22.2	X				
10	-10	3	10.0-15.0	4.8	32.6	X				
					24.4					
					17.2	X				
					19.4	X				
					21.3					
15	-15				18.8	X		(15.5'-17.5') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT; dry to moist; medium stiff; brown (10YR 5/3).		
					24.9	X				

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed.
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**Date Start:** 7/24/2014  
**Date Finish:** 7/24/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 80.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GT19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 70 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	5.0	24.0		[Dotted pattern]	(17.5'-24.5') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT; dry; soft; white tan (10YR 7/2).		
					14.8	X				
25	-25	5	20.0-25.0	4.10	22.5		[Dotted pattern]			
					21.3	X				
					20.4					
					21.7	X				
30	-30	6	25.0-30.0	4.6	43.0		[Dotted pattern]	(24.5'-34.0') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, slow dilatancy; dry to moist; stiff; gray brown (2.5Y 5/2).		
					30.5					
					12.4	X				
					14.2					
35	-35	7	30.0-35.0	5.0	6.3		[Dotted pattern]			
					5.5	X				
					15.0					
					1.5	X				
							[Dotted pattern]	(34.0'-36.0') SAND, very coarse to very fine, subround; some gravel to medium pebbles, subround; some silt; poorly sorted; dry to moist; gray brown (10YR 4/2).		
							[Dotted pattern]	(36.0'-37.0') SILT, slow dilatancy, stiff to very stiff; and SAND, very fine; trace gravel to small pebbles, subround; dry to moist; gray brown (10YR 4/2).		

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 80.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GT19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	4.10	0.7	X	[Dotted pattern]	(37.0'-39.5') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, slow dilatancy; dry to moist; stiff; gray brown (10YR 4/2).		
								(39.5'-40.75') SAND, fine to very fine; some silt; dry to moist; gray (10YR 5/2).		
45	-45	9	40.0-45.0	5.0	0.0	X	[Dotted pattern]	(40.75'-62.5') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, slow dilatancy; dry to moist; medium stiff to stiff; gray brown (10YR 4/2).		
50	-50	10	45.0-50.0	4.10	0.0	X	[Dotted pattern]			
55	-55	11	50.0-55.0	5.0	0.0	X	[Dotted pattern]			

	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed.
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**Date Start:** 7/24/2014  
**Date Finish:** 7/24/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 80.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

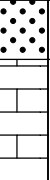
**Well/Boring ID:** SB-GT19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 70 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	55.0-60.0	4.8	0.0	X		NOTE: SILT layer from 57.0'-58.0' bgs.		
					0.0	X				
		13	60.0-65.0	5.0	0.0	X		(62.5'-64.5') SAND, fine to very fine; some silt, slow dilatancy; moist to dry; medium stiff; gray brown (10YR 4/2).		
					0.0	X		(64.5'-65.5') SAND, fine to very fine; little granules to small pebbles, subround; and SILT, slow dilatancy; moist to dry; stiff; gray brown (10YR 3/2).		
65	-65				0.0	X		(65.5'-74.0') SAND, fine to very fine; and SILT, slow dilatancy; dry to moist; stiff; brown (10YR 4/3).		
		14	65.0-70.0	4.10	0.0	X				
					0.0	X				
					0.0	X				
70	-70				0.0	X				
		15	70.0-75.0	4.8	0.0	X				
					0.0	X				
					0.0	X				
75	-75				0.0	X		(74.0'-78.0') SAND, medium to very fine; trace granules to medium pebbles, subround; some silt, slow dilatancy; moist to dry; medium stiff to soft; reddish gray (5YR 4/2).		
		16	75.0-80.0	4.10	0.0	X				
					0.0	X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 80.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GT19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80				0.0	X		(78.0'-80.0') Weathered bedrock; SAND, fine to very fine; and weathered sandstone bedrock fragments to very large pebbles, subround to subangular; trace gravel to medium to large pebbles, subround; dry to moist; gray (10YR 5/1).		
								End of boring at 80.0' bgs.		
85	-85									
90	-90									
95	-95									

	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed.
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<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs. <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Westhuis	<b>Well/Boring ID:</b> SB-GX19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
5	-5	1	0.0-10.0	10.0	0.0		(0.0'-10.0') CONCRETE.			
10	-10	2	10.0-15.0	5.0	0.0	X	(10.0'-14.0') CLAY and SILT, low to medium plasticity, no dilatancy; little fine sand, trace granules to large pebbles, subround; dry to moist; stiff; grayish brown (10YR 5/2). NOTE: Glacial Till.			

**Remarks:** bgs = below ground surface  
Groundwater encountered from 59.0'-86.0' bgs.  
No odor or staining observed.  
No recovery from 40.0'-50.0' bgs.



**Date Start:** 7/18/2014  
**Date Finish:** 7/18/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0' bgs.  
**Surface Elevation:**  
  
**Descriptions By:** A.Westhuis

**Well/Boring ID:** SB-GX19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 80 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	3	15.0-20.0	5.0	0.0	X	[Diagonal Hatching]	(14.0'-25.0') CLAY and SILT, medium to high plasticity, no dilatancy; little fine sand, trace granules to large pebbles, subround; moist; medium stiff to stiff; gray (10YR 5/1). NOTE: Glacial Till.		
	0.0				X					
	0.0				X					
20	-20	4	20.0-25.0	5.0	0.0	X	[Diagonal Hatching]			
	0.0				X					
	0.0				X					
25	-25	5	25.0-30.0	5.0	4.1	X	[Dotted Pattern]	(25.0'-28.0') SAND, fine, trace granules, subround; little silt; well sorted; dry; light yellowish brown (10YR 6/4).		
	8.3				X					
	16.2				X					
	14.1				X					
							[Dotted Pattern]	(28.0'-40.0') SAND, very fine to fine, trace granules to large pebbles, subround; little to some silt; poorly sorted; dry; light yellowish brown (10YR 6/4).		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 59.0'-86.0' bgs.  
 No odor or staining observed.  
 No recovery from 40.0'-50.0' bgs.




<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs. <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Westhuis	<b>Well/Boring ID:</b> SB-GX19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	6	30.0-35.0	3.0	8.6		[Dotted pattern]			
					2.4	X				
					1.8					
					1.2					
					0.9	X				
35	-35	7	35.0-40.0	3.0	1.9		[Dotted pattern]			
					4.3	X				
					2.1					
					3.6					
		2.8								
40	-40	8	40.0-45.0	0.0	1.6		[Dotted pattern]	(40.0'-50.0') No Recovery.		
					NA					
					NA					
					NA					
					NA					
		NA								

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 59.0'-86.0' bgs. No odor or staining observed. No recovery from 40.0'-50.0' bgs.
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<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs. <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Westhuis	<b>Well/Boring ID:</b> SB-GX19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
50	-50	9	45.0-50.0	0.0	NA					
					NA					
					NA					
					NA					
					NA					
		10	50.0-55.0	5.0	0.0	X	(50.0'-51.75') SAND, very fine to fine, trace granules, subround; little to some silt; well sorted; dry; light gray (10YR 7/2).			
					0.0	X	(51.75'-52.25') CLAY and SILT, low plasticity, no dilatancy; little very fine to fine sand, trace granules to large pebbles, subround; dry to moist; stiff; gray (10YR 5/1).			
					0.0	X	(52.25'-54.50') SAND, very fine to fine, trace granules to large pebbles, subround; little silt; poorly sorted; light gray (10YR 7/2).			
					0.0	X	(54.50'-56.50') SILT and CLAY, non-plastic, no dilatancy; trace to little very fine sand, trace granules to small pebbles, subround; dry to moist; stiff; gray (10YR 5/1).			
		11	55.0-60.0	5.0	0.0	X	(56.50'-58.0') SAND, very fine to fine, subround; some silt; well sorted; dry; light gray (10YR 7/2).			
					0.0	X	(58.0'-59.0') SILT; some fine sand, subround; well sorted; dry; stiff; gray (10YR 5/1).			
					0.0	X	(59.0'-75.0') SAND, very fine to fine, subround; some silt; well sorted; moist to wet; gray (10YR 5/1).			
60	-60				0.0					

	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 59.0'-86.0' bgs. No odor or staining observed. No recovery from 40.0'-50.0' bgs.
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**Date Start:** 7/18/2014  
**Date Finish:** 7/18/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0' bgs.  
**Surface Elevation:**  
  
**Descriptions By:** A.Westhuis

**Well/Boring ID:** SB-GX19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 80 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	12	60.0-65.0	5.0	0.0	X	[Dotted pattern]			
					0.0					
					0.0	X				
					0.0					
70	-70	13	65.0-70.0	5.0	0.0	X	[Dotted pattern]			
					0.0					
					0.0	X				
					0.0					
75	-75	14	70.0-75.0	5.0	0.0	X	[Dotted pattern]	(75.0'-86.0') SAND, very fine to fine, subround; and SILT; slow dilatancy; well sorted; moist to wet; gray (10YR 5/1) to brown (10YR 7/2).		
					0.0					
					0.0	X				
					0.0					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 59.0'-86.0' bgs.  
 No odor or staining observed.  
 No recovery from 40.0'-50.0' bgs.



**Date Start:** 7/18/2014  
**Date Finish:** 7/18/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0' bgs.  
**Surface Elevation:**  
  
**Descriptions By:** A.Westhuis

**Well/Boring ID:** SB-GX19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 80 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	15	75.0-80.0	5.0	0.0	X				
		16	80.0-85.0	5.0	0.0	X				
85	-85				0.0	X				
		17	85.0-90.0	5.0	0.0	X		(86.0'-90.0') SAND, very fine to fine, subround; and large SANDSTONE fragments; light gray (10YR 7/2).		
90	-90				0.0			End of boring at 90.0' bgs.		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 59.0'-86.0' bgs.  
 No odor or staining observed.  
 No recovery from 40.0'-50.0' bgs.




<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GX21  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	0.0	NA			(0.0'-5.0') CONCRETE. NOTE: Fill.		
					NA					
					NA					
					NA					
					NA					
5	-5				0.0	X		(5.0'-6.0') SAND, medium to fine, little granules, little granules to medium pebbles, subround; poorly sorted; dry; grayish brown (10YR 6/2). NOTE: Fill.		
		2	5.0-10.0	5.0	0.0	X		(6.0'-7.5') SAND, medium to fine, little granules to small pebbles, subround; little silt; poorly sorted; dry to moist; brown (10YR 4/6). NOTE: Fill, trace metal.		
					0.0			(7.5'-10.0') CONCRETE, crushed. NOTE: Fill; basement of coliseum.		
					0.0					
					0.0					
10	-10				0.0	X		(10.0'-12.0') SAND, coarse to fine, little small to medium pebbles, subround; poorly sorted; moist; brown (10YR 4/3) to black (10YR 2-5/1). NOTE: Black staining and strong odor; trace metal.		
		3	10.0-15.0	5.0	0.0	X		(12.0'-15.0') CLAY and SILT, low plasticity, no dilatancy; little granules to medium pebbles, subround; poorly sorted; dry to moist; brown (10YR 4/3). NOTE: Till; moderate odor.		
					0.0					

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. Strong odor observed from 10.0'-12.0' bgs. Moderate odor observed from 12.0'-15.0' bgs. Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.
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<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GX21  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	4	15.0-20.0	5.0	0.0	X	(15.0'-24.0') CLAY, medium to high plasticity, no dilatancy; trace medium sand, trace to little granules to medium pebbles, subround; dry to moist; soft to medium stiff; gray (10YR 5/1).			
20	-20	5	20.0-25.0	4.5	0.0	X	(24.0'-26.75') CLAY, medium to high plasticity, slow dilatancy; soft to medium stiff; and SAND, coarse to fine; little granules to large pebbles, subround; dry to moist; gray (10YR 5/1) to grayish brown (10YR 5/4).			
25	-25	6	25.0-30.0	5.0	0.0	X	(26.75'-27.0') SAND, medium to very fine; and SILT; well sorted; moist; brown (10YR 5/4). (27.0'-28.5') SAND, medium to very fine; well sorted; dry; tan (10YR 6/3). (28.5'-35.0') SAND, medium to fine, little granules to large pebbles, subround; dry to moist; brown (10YR 5/4).			

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. Strong odor observed from 10.0'-12.0' bgs. Moderate odor observed from 12.0'-15.0' bgs. Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.
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**Date Start:** 7/21/2014  
**Date Finish:** 7/21/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GX21  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 80 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	7	30.0-35.0	4.3	0.0		[Pattern: Dotted]			
	0.0				X					
	0.0									
	0.0				X					
	0.0									
35	-35	8	35.0-40.0	4.6	0.0		[Pattern: Dotted]	(35.0'-36.5') SAND, medium to fine, some granules to large pebbles, subround; dry; tan (10YR 6/2).		
	0.0				X	(36.5'-39.5') SAND, medium to very fine, little granules to small to medium pebbles, subround; well sorted; dry to moist; tan (10YR 6/4).				
	0.0									
	0.0				X					
	0.0									
40	-40	9	40.0-45.0	4.1	0.0		[Pattern: Dotted]	(39.5'-40.5') SAND, medium to very fine; little granules to small pebbles, subround; some silt; poorly sorted; dry to moist; tan (10YR 5/4).		
	0.0				X	(40.5'-44.5') SAND, coarse to fine; some granules to large pebbles, subround; some silt; poorly sorted; dry to moist; tan (10YR 6/3).				
	0.0									
	0.0				X					
	0.0									
					0.0		[Pattern: Dotted]	(44.5'-45.0') SAND, fine to very fine; and SILT, some clay, medium plasticity; dry to moist; soft; tan (10YR 6/4).		

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 Strong odor observed from 10.0'-12.0' bgs.  
 Moderate odor observed form 12.0'-15.0' bgs.  
 Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.



<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GX21  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0.0						X	(45.0'-46.5')	SAND, coarse to fine, some granules to medium pebbles, subround; trace silt; poorly sorted; dry; tan (10YR 6/3).		
0.0		10	45.0-50.0	4.5			(46.5'-47.5')	SAND, coarse to fine, some granules to small to medium pebbles, subround; some silt; poorly sorted; dry; tan (10YR 5/3).		
0.0						X	(47.5'-49.0')	SAND, coarse to fine, some granules to medium pebbles, subround; little silt; poorly sorted; dry; light gray (10YR 7/2).		
0.0						X	(49.9'-51.5')	SAND, fine to very fine; trace granules to small pebbles, subround; well sorted; dry; light gray (10YR 7/2).		
0.0		11	50.0-55.0	4.6			(51.5'-54.0')	SAND, fine to very fine; and SILT; well sorted; dry; tan (10YR 6/3).		
0.0						X	(54.0'-56.0')	SILT, little clay, non-plastic to low plasticity, no dilatancy; little very fine to fine sand; soft; dry; gray brown (10YR 5/2). NOTE: Some black staining.		
0.0		12	55.0-60.0	5.0			(56.0'-63.5')	SAND, fine to very fine; little granules to large pebbles, subround; and SILT; poorly sorted; dry to moist; brown (10YR 5/3).		
0.0						X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. Strong odor observed from 10.0'-12.0' bgs. Moderate odor observed from 12.0'-15.0' bgs. Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.
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**Date Start:** 7/21/2014  
**Date Finish:** 7/21/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-GX21  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Sunny, 80 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
		13	60.0-65.0	4.5	0.0	X				
					0.0			(63.5'-65.0') SILT, non-plastic, slow dilatancy; and SAND, fine; trace granules to medium pebbles, subround; very stiff; dry to moist; gray (10YR 5/2).		
65	-65				0.0	X		(65.0'-82.5') SAND, fine to very fine; trace granules to very large pebbles; and SILT, little clay, medium plasticity, slow to medium dilatancy; poorly sorted; soft; moist; gray (2.5Y 5/1). NOTE: Till.		
		14	65.0-70.0	4.6	0.0	X				
					0.0					
					0.0	X				
70	-70				NA	X				
					NA					
		15	70.0-75.0	4.8	NA	X				
					NA					
					NA	X				
75	-75				NA					
					NA					
					NA					

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 Strong odor observed from 10.0'-12.0' bgs.  
 Moderate odor observed form 12.0'-15.0' bgs.  
 Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.



<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-GX21  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	16	75.0-80.0	4.5	NA	X				
					NA					
					NA					
		17	80.0-85.0	4.8	0.0	X				
					0.0			(82.5'-83.25') SAND, fine to very fine, trace granules to small pebbles; and SILT, trace clay, medium plasticity, slow to medium dilatancy; soft; moist; gray (2.5Y 5/1).		
					0.0	X		(83.25'-86.5') SAND, fine to very fine, trace granules to small pebbles; and SILT, trace clay, medium plasticity, slow to medium dilatancy; poorly sorted; soft; moist; gray (2.5Y 5/1).		
85	-85				0.0	X				
					0.0			(86.5'-87.0') SAND, coarse to fine, some granules to medium to large pebbles, subround; poorly sorted; moist; gray (2.5Y 4/1).		
		18	85.0-90.0	4.6	0.0	X		(87.0'-90.0') SAND, fine to very fine, trace granules to small pebbles; and SILT, trace clay, medium plasticity, slow to medium dilatancy; poorly sorted; very stiff; moist (2.5Y 4/2).		
					0.0					
					0.0	X		NOTE: Weathered sandstone bedrock at 90.0' bgs.		
90	-90							End of boring at 90.0' bgs.		

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. Strong odor observed from 10.0'-12.0' bgs. Moderate odor observed from 12.0'-15.0' bgs. Black staining observed from 10.0'-12.0' and 54.0'-56.0' bgs.
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**Date Start:** 7/30/2014  
**Date Finish:** 7/31/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX24b  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA	X	(0.0'-1.5') CONCRETE.			
					0.0			(1.5'-10.0') SILT, little clay, low plasticity, rapid dilatancy; some sand; little small pebbles, subround to subangular; very hard; dark yellowish brown (10YR 4/4).		
					0.0	X				
5	-5	2	5.0-10.0	4.0	0.0	X				
					0.0					
					0.0	X				
10	-10	3	10.0-12.0	2.0	NA	X		(10.0'-12.0') SHELBY TUBE, no description.		
					NA					
					0.0	X	(12.0'-20.0') CLAY, medium plasticity; little sand; little small pebbles, subround to subangular; dry; medium stiff; dark gray (10YR 4/1). Note: TILL.			
		4	12.0-20.0	8.0	0.0	X				
					0.0					
					0.0	X				
15	-15				0.0					
					0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/30/2014  
**Date Finish:** 7/31/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX24b  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	5	20.0-22.0	2.0	NA	X	(20.0'-22.0')	SHELBY TUBE, no description.		
25	-25	6	22.0-30.0	8.0	NA	X	(22.0'-25.0')	CLAY, low plasticity, rapid dilatancy; some sand; little small pebbles, subround to subangular; moist; stiff; dark gray (10YR 4/1). Note: TILL.		
30	-30	7	30.0-40.0	10.0		X	(25.0'-30.0')	SAND, medium; little granules, subangular to subround; little silt; poorly sorted; pale brown (10YR 6/3).		
35	-35				0.1	X	(30.0'-41.0')	SAND, fine to medium; little medium pebbles, subround; little silt; poorly sorted; dry; pale brown (10YR 6/3).		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/30/2014  
**Date Finish:** 7/31/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX24b  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	40.0-50.0	8.4	0.0	X	[Dotted pattern]			
	0.1				X					
	0.0				X					
	0.0				X					
45	-45				0.0	X	[Vertical lines pattern]	(43.5'-44.5') SILT, low plasticity, rapid dilatancy; little sand; dry; stiff; gray (10YR 5/1).		
	0.0				X	[Dotted pattern]	(44.5'-46.0') SAND, fine to medium; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).			
	0.0				X		(46.0'-58.0') SAND, fine to medium; little small pebbles, subangular to subround; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).			
	0.0				X					
50	-50	9	50.0-60.0	8.7	0.0	X	[Dotted pattern]			
	0.1				X					
	0.1				X					
	0.1				X					
55	-55				0.1	X				
					0.1	X				
					0.2					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/30/2014  
**Date Finish:** 7/31/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX24b  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	10	60.0-70.0	10.0		X	(58.0'-62.0') SAND, medium; little silt; well sorted; dry; dark grayish brown (10YR 4/2).			
65	-65					X	(62.0'-65.0') SILT, low plasticity, rapid dilatancy; some sand; dry; hard; dark gray (10YR 4/1).			
65	-65					X	(65.0'-70.0') SAND; some silt, non-plastic, rapid dilatancy; wet; soft; dark gray (10YR 4/1).			
70	-70	11	70.0-72.0	1.3	NA	X	(70.0'-72.0') SHELBY TUBE, no description.			
75	-75	12	72.0-80.0	8.0		X	(72.0'-90.0') SAND, fine; and SILT, low plasticity, rapid dilatancy; wet; soft; dark gray (10YR 4/1).  Note: hard, dry, silt layer 0.25' thick at 74.0' bgs.			

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/30/2014  
**Date Finish:** 7/31/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX24b  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 75 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	13	80.0-90.0	10.0	0.0	X	[Dotted pattern]	Note: hard, dry, silt layer 0.25' thick at 80.0' bgs.		
					0.0	X				
					0.0	X				
85	-85				0.0	X	[Dotted pattern]			
					0.0	X				
					0.0	X				
90	-90	14	90.0-92.0	0.6	NA	X	[Dotted pattern]	(90.0'-92.0') SHELBY TUBE, no description.		
					NA	X		(92.0'-97.0') BEDROCK, weathered sandstone. Note: Grand River Formation.		
95	-95	15	92.0-97.0	5.0	0.0	X	[Horizontal line pattern]			
					0.0	X				
					0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs.  
 No odor or staining observed.




<b>Date Start:</b> 7/30/2014 <b>Date Finish:</b> 7/31/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> B.Price/J.Greer/S.Gross <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 97.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX24b  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
100-100								End of boring at 97.0' bgs.		
105-105										
110-110										
115-115										

 <i>Infrastructure · Water · Environment · Buildings</i>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 65.0'-70.0' and 72.0'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 92.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX26  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
					NA		(0.0'-1.5') CONCRETE.			
					NA		(1.5'-12.0') SILT, low plasticity, rapid dilatancy; and SAND, fine; little medium pebbles, subround; poorly sorted; moist; dark yellowish brown (10YR 4/6). NOTE: Fill.			
5	-5	1	0.0-10.0	10.0		X				
						X				
10	-10					X				
		2	10.0-15.0	4.1			(12.0'-14.0') SAND, medium; some medium pebbles, subangular to subround; little silt; poorly sorted; dry; dark yellowish brown (10YR 4/6).			

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs. No odor or staining observed.
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**Date Start:** 7/18/2014  
**Date Finish:** 7/21/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 92.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX26  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Sunny, 80 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	3	15.0-20.0	5.0	0.2	X		(14.0'-18.0') SILT, low plasticity, slow dilatancy; little sand; little medium pebbles, subangular to subround; dry; soft; dark yellowish brown (10YR4/6). NOTE: Fill.		
	0.0				X					
20	-20	4	20.0-30.0	10.0	0.0	X		(18.0'-25.5') CLAY, little silt, medium plasticity, slow dilatancy; little sand; trace small pebbles, subround; dry; stiff; dark gray (10YR 4/1). NOTE: Glacial Till.		
	0.0				X					
	0.1				X					
	0.1				X					
25	-25				0.0	X		(25.5'-26.5') SAND, medium; little medium pebbles, subround; trace silt; poorly sorted; dry; pale brown (10YR 6/3).		
					0.0	X		(26.5'-27.5') SILT, low plasticity, rapid dilatancy; little silt; dry; soft; yellowish brown (10YR 5/6).		
					0.0	X		(27.5'-31.5') SAND, medium; some medium pebbles, subround; poorly sorted; dry; light olive brown (2.5Y 5/6).		
					0.1	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/18/2014  
**Date Finish:** 7/21/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 92.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX26  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Sunny, 80 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	5	30.0-35.0	5.0	0.1	X				
	0.0				X	(31.5'-32.5') SILT, low plasticity, rapid dilatancy; little sand; dry; soft; yellowish brown (10YR 5/6).				
	0.0				X	(32.5'-35.0') SAND, medium; some medium pebbles, subround; poorly sorted; dry; light olive brown (2.5Y 5/6).				
	0.1				X					
35	-35	6	35.0-40.0	5.0	0.0	X				
	0.2				X	(35.0'-36.5') SAND, medium, little small pebbles, subround; some silt; poorly sorted; dry; light olive brown (2.5Y 5/6).				
	0.2				X	(36.5'-37.5') SILT, non-plastic, slow dilatancy; some sand; little small pebbles, subround; dry; stiff; light brownish gray (10YR 5/2).				
	0.1				X	(37.5'-42.5') SAND, medium, little small pebbles, subangular to subround; trace silt; dry; light olive brown (2.5Y 5/6).				
40	-40	7	40.0-45.0	5.0	0.0	X				
	0.2				X	(42.5'-43.5') SAND, very fine; and SILT, low plasticity, slow dilatancy; moist; medium stiff; grayish brown (10YR 5/2).				
	0.2				X	(43.5'-44.5') SAND, medium to coarse, little large pebbles, subround; little silt; poorly sorted; dry; pale brown (10YR 6/3).				
	0.1				X					
					0.0	X		(44.5'-45.5') SILT, non-plastic, rapid dilatancy; dry; little sand; medium stiff; grayish brown (10YR 5/2).		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/18/2014  
**Date Finish:** 7/21/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 92.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX26  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 80 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
45.5	-50.0	8	45.0-50.0	2.0		X	(45.5'-52.0')	SAND, fine; some silt; poorly sorted; dry; light brownish gray (10YR 6/2). NOTE: Little recovery due to fine sands locking up core barrel.		
50.0	-50.0					X				
55.0	-55.0	9	50.0-55.0	5.0		X	(52.0'-60.0')	SAND, medium; some silt; poorly sorted; wet; grayish brown (10YR 5/2).		
55.0	-55.0					X		NOTE: Transition to dry at 55.0' bgs.		
56.0	-55.0					X		NOTE: Transition to wet at 56.0' bgs.		
60.0	-60.0	10	55.0-60.0	4.0		X	(60.0'-64.0')	SILT, low plasticity, slow dilatancy; and SAND, fine; little medium pebbles, subround; poorly sorted; dry; dark gray (10YR 4/1).		
60.0	-60.0					X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs.  
 No odor or staining observed.




<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 92.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX26  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	11	60.0-70.0	8.0		X				
70	-70					X		(64.0'-73.5') SAND, very fine; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
		12	70.0-78.0	8.0		X				
						X		(73.5'-75.0') SILT, medium plasticity, no dilatancy; dry; hard; very dark grayish brown (10YR 3/2).		
75	-75					X		(75.0'-76.0') SAND, very fine; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
						X		(76.0'-80.0') SILT, medium plasticity, no dilatancy; dry; hard; very dark grayish brown (10YR 3/2).		

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/18/2014 <b>Date Finish:</b> 7/21/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 92.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX26  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 80 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	13	78.0-92.0	13.0	0.0	X				
					0.0			(80.0'-82.5') SILT, low plasticity, rapid dilatancy; little sand; wet; soft; dark yellowish brown (10YR 3/6).		
					0.0	X		(82.5'-83.5') SILT, medium plasticity, no dilatancy; dry; hard; very dark grayish brown (10YR 3/2).		
					0.0			(83.5'-85.5') SILT, low plasticity, rapid dilatancy; little sand; wet; soft; dark yellowish brown (10YR 3/6).		
85	-85				0.0	X		(85.5'-86.5') SILT, medium plasticity, no dilatancy; dry; hard; very dark grayish brown (10YR 3/2).		
					0.0			(86.5'-90.0') SAND, fine; some silt; poorly sorted; wet; dark yellowish brown (10YR 3/6).		
90	-90				0.0	X		(90.0'-92.0') BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
					0.0			End of boring at 92.0' bgs.		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 45.5'-60.0', 64.0'-73.5', 75.0'-76.0', 80.0'-82.5', 83.5'-85.5', 85.6'-90.0' bgs. No odor or staining observed.
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**Date Start:** 7/17/2014  
**Date Finish:** 7/18/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 75 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
					NA			(0.0'-1.5') CONCRETE.		
					NA			(1.5'-15.0') SAND and SILT; little clay; little large pebbles, subangular; moist; brown (7.5YR 4/3). NOTE: Fill.		
5	-5	1	0.0-5.0	10.0		X				
						X				
						X				
10	-10									
		2	5.0-10.0	5.0		X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs.  
 No odor or staining observed.



<b>Date Start:</b> 7/17/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	3	10.0-15.0	5.0	0.0	X	(15.0'-23.0')	CLAY, trace silt, high plasticity, slow dilatancy; trace sand, little small pebbles, subround; medium stiff; dark gray (10YR 4/1). NOTE: Fill.		
20	-20	4	15.0-20.0	5.0	0.4	X	(23.0'-24.0')	SILT, little clay, low plasticity, rapid dilatancy; trace small pebbles, subangular; dry; stiff; dark gray (10YR 4/1).		
25	-25	5	20.0-25.0	5.0	0.1	X	(24.0'-24.5')	PEBBLES, large, subround; little sand; poorly sorted; dry; very pale brown (10YR 7/3).		
					0.1	X	(24.5'-25.5')	SILT and SAND; wet; dark gray (10YR 4/1).		
					0.0	X	(25.5'-27.0')	SAND, very coarse, subangular to subround; some medium pebbles, subround; poorly sorted; dark yellowish brown (10YR 6/6).		
					0.0	X	(27.0'-32.0')	SAND, medium; well sorted; dry; light yellowish brown (10YR 6/4).		

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/17/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction	
30	-30	6	25.0-30.0	5.0	0.0	X					
	0.0				X						
	0.0				X				(32.0'-33.0') SAND, very fine; some silt; poorly sorted; wet; yellowish brown (10YR 5/4).		
	0.1				X				(33.0'-35.0') SAND, medium; little silt; poorly sorted; dry; yellowish brown (10YR 5/6).		
35	-35	7	30.0-38.0	5.0	0.0	X					
	0.1				X				(35.5'-36.5') SILT, non-plastic, rapid dilatancy; little sand; dry; very soft; yellowish brown (10YR 5/3).		
	0.0				X				(36.5'-40.5') SAND, medium; trace silt; well sorted; dry; light yellowish brown (10YR 6/4).		
	0.0				X						
40	-40	8	38.0-45.0	5.0	0.0	X					
	0.0				X				(40.0'-41.5') SAND and SILT; wet; light yellowish brown (2.5Y 6/4).		
	0.0				X				(41.5'-42.5') SAND, medium; well sorted; dry; light yellowish brown (2.5Y 6/4).		
	0.0				X				(42.5'-43.5') SILT, low plasticity, slow dilatancy; trace sand, trace granules, subangular to subround; moist; very soft; light yellowish brown (2.5Y 6/4).		
	0.0	X					(43.5'-45.0') SAND, medium; well sorted; dry; light yellowish brown (2.5Y 6/4).				

**Remarks:** bgs = below ground surface  
Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs.  
No odor or staining observed.




<b>Date Start:</b> 7/17/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
45.0		9	45.0-50.0	5.0		X	(45.0'-47.5') SAND, medium; little silt; poorly sorted; dry; light yellowish brown (2.5Y 4/6).			
47.5						X	(47.5'-48.5') SILT, non-plastic, rapid dilatancy; little sand; moist; soft; yellowish brown (10YR 5/6).			
48.5						X	(48.5'-49.5') SILT, low plasticity, slow dilatancy; some sand, little small pebbles, subangular to subround; dry; hard; dark gray (10YR 4/1).			
49.5						X	(49.5'-51.0') SAND, medium; little silt; poorly sorted; moist; dark gray (10YR 4/1).			
51.0		10	50.0-55.0	4.0		X	(51.0'-52.0') SILT, low plasticity, slow dilatancy; little sand; dry; stiff; very dark grayish brown (10YR 3/2).			
52.0						X	(52.0'-55.0') SAND, medium; trace silt; well sorted; dry; light brownish gray (10YR 6/2).			
55.0		11	55.0-60.0	5.0		X	(55.0'-57.0') SILT, low plasticity, rapid dilatancy; some sand; moist; soft; dark gray (10YR 4/1).			
57.0						X	(57.0'-61.0') SAND, medium; well sorted; dry; grayish brown (10YR 5/2).			

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/17/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	12	60.0-65.0	5.0	0.0	X		(61.0'-64.0') CLAY, trace silt, high plasticity, slow dilatancy; trace sand, little small pebbles, subround; dry; hard; dark gray (10YR 4/1).		
								(64.0'-67.0') SAND, very fine; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
70	-70	13	65.0-73.0	9.0	0.0	X		(67.0'-68.0') SILT, medium plasticity, no dilatancy; dry; very hard; dark gray (10YR 4/1).		
								(68.0'-73.0') SAND, very fine; and SILT, low plasticity; wet; dark gray (10YR 4/1).		
								(73.0'-74.5') SILT, medium plasticity, no dilatancy; dry; very hard; dark gray (10YR 4/1).		
								(74.5'-77.0') SILT, low plasticity, rapid dilatancy; and SAND, very fine; poorly sorted; wet; dark gray (10YR 4/1).		
75	-75				0.0	X				

 <b>ARCADIS</b> <i>Infrastructure · Water · Environment · Buildings</i>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/17/2014 <b>Date Finish:</b> 7/18/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	14	73.0-80.0	7.0	0.0	X		(77.0'-78.5') SILT, medium plasticity, slow dilatancy; little sand; dry; very hard; dark gray (10YR 4/1).		
					0.0	X		(78.5'-80.0') SAND; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
					0.0	X		(80.0'-81.5') SILT, medium plasticity, slow dilatancy; trace sand; dry; hard; very dark grayish brown (10YR 3/2).		
		15	80.0-86.0	?		X		(81.5'-82.5') SILT, low plasticity, rapid dilatancy; little sand; wet; medium stiff; dark yellowish brown (10YR 4/4).		
						X		(82.5'-83.5') SILT, medium plasticity, slow dilatancy; trace sand; dry; hard; very dark grayish brown (10YR 3/2).		
85	-85					X		(83.5'-90.0') SILT, low plasticity, rapid dilatancy; and SAND, very fine, trace medium pebbles, subround; wet; dark yellowish brown (10YR 4/4).		
90	-90	16	86.0-92.0	?		X		(90.0'-92.0') BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
								End of boring at 92.0' bgs.		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 24.5'-25.5', 32.0'-33.0', 40.5'-41.5', 64.0'-67.0', 68.0'-73.0', 74.5'-77.0', 78.5'-80.0', 81.5'-82.5', 83.5'-90.0' bgs. No odor or staining observed.
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<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/B.Logan <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> NA
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	2.0	NA	X	(0.0'-1.5') CONCRETE.			
					0.0		(1.5'-10.0') SAND, medium; little large pebbles, angular; little silt, trace clay; poorly sorted; dry; dark yellowish brown (10YR 4/2). NOTE: Fill.			
5	-5	2	5.0-10.0	2.5		X				
					0.0					
					0.0					
					0.0					
10	-10	3	10.0-15.0	5.0		X	(10.0'-14.0') SILT, low plasticity, slow dilatancy, little sand, little medium pebbles, subround; dry; stiff; light olive brown (2.5Y 5/4). NOTE: Fill.			
					0.0					
					0.0					
					0.0					
15	-15					X	(14.0'-16.0') CLAY, little silt, medium plasticity, slow dilatancy; trace large pebbles subround; dry; medium stiff; dark gray (10YR 4/1).			
					0.0					
					0.0					
					0.0					
					0.0			(16.0'-21.0') SILT, low plasticity, slow dilatancy; trace sand, little medium pebbles, angular; dry; very hard; olive brown (2.5Y 4/4).		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 48.0'-49.5', 55.0'-57.0' and 69.0'-86.0' bgs. Boring moved 1.0' south of originally planned location. No odor or staining observed.
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<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/B.Logan <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> NA
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	5.0	0.0	X				
					0.0	X				
					0.0	X				
		5	20.0-25.0	4.4	0.0	X		(21.0'-25.0') SAND, very coarse, subangular to subround, little medium pebbles, subround; dry; poorly sorted; light olive brown (2.5Y 5/4).		
					0.0	X				
					0.0	X				
25	-25				0.0	X		(25.0'-27.0') SAND, fine; trace granules, subangular to subround; little silt; poorly sorted; dry; light olive brown (2.5Y 5/6).		
					0.0	X				
					0.0	X				
		6	25.0-33.0	5.0	0.0	X		(27.0'-33.0') SAND, medium; little small pebbles, subangular to subround; little silt; well sorted; dry; light; yellowish brown (2.5Y 6/3).		
					0.0	X				
					0.0	X				
30	-30				0.0	X				
					0.0	X				
					0.0	X				
					0.0	X				
					0.0	X				
					0.0	X				
35	-35				0.0	X		(33.0'-38.0') SAND, coarse, subangular to subround; some large pebbles, subangular; trace silt; poorly sorted; dry; dark yellowish brown (10YR 4/6).		
					0.0	X				
					0.0	X				
		7	33.0-40.0	7.0	0.0	X				
					0.0	X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 48.0'-49.5', 55.0'-57.0' and 69.0'-86.0' bgs. Boring moved 1.0' south of originally planned location. No odor or staining observed.
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<b>Date Start:</b> 7/24/2014 <b>Date Finish:</b> 7/24/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/B.Logan <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-GX34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> NA
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	40.0-45.0	4.0	0.0	X	(38.0'-40.0') SAND, coarse, subangular to subround; little medium pebbles, subround; well sorted; dry; light yellowish brown (10YR 6/4).			
					0.0	X	(40.0'-41.5') SILT, low plasticity, rapid dilatancy; some sand; moist; soft; light olive brown (2.5Y 5/6).			
					0.0	X	(41.5'-43.0') SAND, medium; trace pebbles, subround to subangular; little silt; well sorted; dry; light yellowish brown (10YR 6/4).			
					0.0	X	(43.0'-44.0') PEBBLES, small, subangular to subround; little coarse sand; poorly sorted; dry; dark yellowish brown (10YR 4/6.).			
					0.0	X	(44.0'-45.0') SAND, medium; trace granules, subangular; some silt; poorly sorted; dry; light yellowish brown (10YR 6/4).			
45	-45	9	45.0-47.5	2.5	0.0	X	(45.0'-47.0') SAND, medium; well sorted; moist; light yellowish brown (10YR 6/4).			
					0.0	X	(47.0'-48.5') SAND, medium; little silt; well sorted; wet; light olive brown (2.5Y 5/4).			
		10	47.5-50.0	2.5	0.0	X	(48.5'-49.5') SAND, very fine; and SILT; wet; dark grayish brown (2.5Y 4/2).			
					0.0	X	(49.5'-55.0') SAND, medium; trace silt; poorly sorted; soft; moist; light olive brown (2.5Y 5/4).			
50	-50	11	50.0-52.0	2.0	0.0	X	(55.0'-57.0') SAND, fine; and SILT, non-plastic, rapid dilatancy; wet; dark gray (10YR 4/1).			
					0.0	X				
		12	52.0-60.0	8.0	0.0	X				
55	-55				0.0	X				

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 48.0'-49.5', 55.0'-57.0' and 69.0'-86.0' bgs. Boring moved 1.0' south of originally planned location. No odor or staining observed.
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**Date Start:** 7/24/2014  
**Date Finish:** 7/24/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Logan  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** NA

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	13	60.0-70.0	10.0	0.0	X	(57.0'-60.0') SAND, medium; trace silt; well sorted; moist; dark gray (10YR 4/1).			
	0.0					(60.0'-66.0') SAND, fine; some silt; poorly sorted; moist; light olive brown (2.5Y 5/4).				
65	-65				0.0	X	(66.0'-69.0') SAND, medium; well sorted; moist; dark gray (10YR 4/1).			
	0.0					X	(69.0'-77.5') SAND, fine; and SILT, low plasticity, rapid dilatancy; wet; dark gray (10YR 4/1).			
70	-70	14	70.0-80.0	10.0	0.0	X				
	0.0					X				
75	-75				0.0					
	0.0					X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 48.0'-49.5', 55.0'-57.0' and 69.0'-86.0' bgs.  
 Boring moved 1.0' south of originally planned location.  
 No odor or staining observed.



**Date Start:** 7/24/2014  
**Date Finish:** 7/24/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Logan  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-GX34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** NA


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	15	80.0-90.0	10.0		X	(77.5'-78.5')	SAND, medium; trace silt; well sorted; wet; dark gray (10YR 4/1).		
						X	(78.5'-79.5')	SILT, low plasticity, rapid dilatancy; some sand; wet; hard; yellowish brown (10YR 5/4).		
						X	(79.5'-86.0')	SAND, fine; trace small cobbles, subround; and SILT, low plasticity, rapid dilatancy; wet; medium stiff; dark yellowish brown (10YR 4/4).		
						X	(86.0'-87.0')	BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
						X	(87.0'-87.5')	SAND, medium; some large pebbles, subround; some silt; poorly sorted; dry; dark gray (10YR 4/1).		
						X	(87.5'-90.0')	BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
90	-90							End of boring at 90.0' bgs.		
95	-95									

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 48.0'-49.5', 55.0'-57.0' and 69.0'-86.0' bgs.  
 Boring moved 1.0' south of originally planned location.  
 No odor or staining observed.



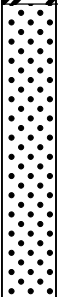



<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/22/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HA24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-2.0	2.0	NA		(0.0'-2.0') CONCRETE.			
		2	2.0-5.0	0.0	NA		(2.0'-5.0') No Recovery.			
5	-5	3	5.0-10.0	3.3	0.0		(5.0'-12.0') SILT, low plasticity, slow dilatancy; little sand; some small pebbles, subangular; dry; stiff; dark yellowish brown (10YR 4/4). NOTE: Fill.			
					0.0	X				
					0.0					
10	-10	4	10.0-15.0	5.0	0.0		(12.0'-15.0') SILT, low plasticity, slow dilatancy; some sand, some small pebbles, subangular to subround; dry; medium stiff; dark yellowish brown (10YR 4/4). NOTE: Fill.			
					0.0	X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs. No odor or staining observed. No recovery from 2.0'-5.0' bgs.
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<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/22/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HA24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	5	15.0-20.0	5.0	0.0	X		(15.0'-25.0') CLAY, little silt, high plasticity, no dilatancy; little medium pebbles, subround; dry; medium stiff; dark gray (10YR 4/1). NOTE: Till.		
20	-20	6	20.0-25.0	5.0	0.0	X				
25	-25	7	25.0-30.0	5.0	0.0	X		(25.0'-40.0') SAND, medium to coarse, some medium pebbles, subangular to subround; little silt; poorly sorted; dry; brown (10YR 4/3). NOTE: Well sorted from 27.5'-28.0' bgs.		

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs. No odor or staining observed. No recovery from 2.0'-5.0' bgs.
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**Date Start:** 7/21/2014  
**Date Finish:** 7/22/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HA24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction	
30	-30	8	30.0-35.0	5.0	0.0	X		NOTE: Transition to light olive brown (2.5Y 5/4) at 35.0' bgs.			
					0.0						
					0.0	X					
					0.0						
35	-35	9	35.0-40.0	5.0	0.0	X					
					0.0						
					0.0	X					
					0.0						
40	-40	10	40.0-42.0	2.0	0.0	X		(40.0'-41.0') SAND, very fine, little granules, subangular to subround; little silt; poorly sorted; light brownish gray (10YR 6/2).			
					0.0			(41.0'-42.5') SAND, fine, little medium pebbles, subangular to subround; some silt; poorly sorted; dry; light brownish gray (10YR 6/2).			
					0.0	X		(42.5'-44.5') PEBBLES, medium, subround; little coarse sand; poorly sorted; dry; grayish brown (10YR 5/2).			
		11	42.0-45.0	1.5	0.0	X		(44.5'-45.5') SILT, low plasticity, rapid dilatancy; trace sand; dry; soft; dark grayish brown (10YR 4/2).			
					0.0						

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs.  
 No odor or staining observed.  
 No recovery from 2.0'-5.0' bgs.



<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/22/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HA24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0.0						X		(45.5'-47.0') SAND, fine, trace small pebbles, subangular to subround; some silt; poorly sorted; dry; brown (10YR 5/3).		
0.0		12	45.0-50.0	5.0		X		(47.0'-48.0') SAND, very fine, little granules, subangular to subround; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).		
0.0						X		(48.0'-48.5') PEBBLES, medium, subround; little medium sand; poorly sorted; dry; grayish brown (10YR 5/2).		
0.0						X		(48.5'-50.0') SILT, non-plastic, rapid dilatancy; some sand; dry; very soft; light yellowish brown (2.5Y 6/4).		
0.0		13	50.0-55.0	5.0		X		(50.0'-53.0') SAND, very fine, trace granules, subangular to subround; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).		
0.0						X		(53.0'-55.0') SAND, medium; well sorted; dry; grayish brown (10YR 5/2).		
0.0						X		(55.0'-56.0') SAND, very fine, little silt; well sorted; dry; light brownish gray (10YR 6/2).		
0.0		14	55.0-60.0	5.0		X		(56.0'-57.0') SAND, medium; well sorted; dry; light olive brown (2.5Y 5/4).		
0.0						X		(57.0'-60.0') SAND, fine; and SILT, low plasticity, rapid dilatancy; trace small pebbles, subround; moist; medium stiff; dark gray (10YR 4/1). NOTE: Till.		
1.2						X		(60.0'-68.0') SAND; little silt, low plasticity, rapid dilatancy; wet; soft; dark gray (10YR 4/1).		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs. No odor or staining observed. No recovery from 2.0'-5.0' bgs.
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**Date Start:** 7/21/2014  
**Date Finish:** 7/22/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HA24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	15	60.0-65.0	5.0	0.0	X				
					0.0	X				
		16	65.0-70.0	5.0	0.0	X				
					0.0	X				
70	-70				0.0	X		(69.0'-70.0') SILT, low plasticity, rapid dilatancy; and SAND, fine; wet; dark gray (10YR 4/1).		
					0.0	X		(70.0'-75.5') SAND, fine; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
					0.0	X		NOTE: Dry, hard SILT layer from 72.0'-72.5' bgs.		
75	-75	17	70.0-80.0	10.0	0.0	X				
					0.0	X		(75.5'-77.0') SILT, low plasticity, no dilatancy; dry; hard; dark gray (10YR 4/1).		


**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs.  
 No odor or staining observed.  
 No recovery from 2.0'-5.0' bgs.






<b>Date Start:</b> 7/21/2014 <b>Date Finish:</b> 7/22/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HA24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
95-95					0.0 0.0	X	HH HH HH	(93.0'-95.0') BEDROCK (weathered sandstone). NOTE: Grand River formation.		
								End of boring at 95.0' bgs.		

	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-75.5' and 77.0'-93.0' bgs. No odor or staining observed. No recovery from 2.0'-5.0' bgs.
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<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/29/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 97.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC14  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Partly Cloudy, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-1.5	1.5	NA			(0.0'-1.5') CONCRETE.		
					NA			(1.5'-10.0') No Recovery.		
					NA					
					NA					
-5	-5	2	1.5-10.0	0.0	NA					
					NA					
					NA					
					NA					
					NA					
					NA					
-10	-10				0.0			(10.0'-15.0') SILT, little clay, little sand, medium plasticity, slow dilatancy; moist; soft; dark yellowish brown 910YR 4/6). NOTE: Little medium pebbles, subangular to subround; Fill.		
					0.0					
		3	10.0-15.0	5.0	0.0	X				
					0.0					

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs. No odor or staining observed. No recovery from 1.5'-10.0' bgs.
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<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/29/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 97.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC14  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Partly Cloudy, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction	
15	-15	4	15.0-20.0	5.0	0.0	X		(15.0'-26.0') CLAY, little silt, high plasticity, slow dilatancy; little small pebbles, subround to subangular; dry; medium stiff; dark gray (10YR 4/1). NOTE: Till.			
					0.0	X					
					0.0	X					
					0.0	X					
20	-20	5	20.0-25.0	4.3	0.0	X			(26.0'-27.0') SAND, medium, little silt, little medium pebbles, subround to subangular; poorly sorted; moist; light olive brown (2.5Y 5/4).		
					0.0	X			(27.0'-30.0') SAND, medium; well sorted; dry; pale brown (10YR 6/3).		
25	-25	6	25.0-30.0	4.4	0.0	X					

	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs. No odor or staining observed. No recovery from 1.5'-10.0' bgs.
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**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HC14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Partly Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	7	30.0-35.0	5.0	0.0	X				
	0.0				X	(30.0'-31.0') SAND, coarse, some medium pebbles, subround to subangular; poorly sorted; dry; grayish brown (10YR 4/2).				
	0.0				X	(31.0'-33.0') SAND, little silt, fine to medium, trace small pebbles, subround to subangular; poorly sorted; moist; light olive brown (2.5Y 5/4).				
	0.0				X	(33.0'-40.0') SAND, coarse, subround to subangular, little medium pebbles, subround to subangular; trace silt; poorly sorted; dry; grayish brown (10YR 4/2).				
35	-35	8	35.0-40.0	5.0	0.0	X				
	0.0				X					
	0.0				X					
40	-40	9	40.0-45.0	4.0	0.0	X				
	0.0				X	(40.0'-47.0') SAND, medium, little silt, trace granules, subround to subangular; well sorted; dry; light olive brown (2.5Y 5/4).				
	0.0				X					
	0.0				X					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs.  
 No odor or staining observed.  
 No recovery from 1.5'-10.0' bgs.



**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HC14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Partly Cloudy, 70 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0										
10		10	45.0-50.0	5.0				(47.0'-50.0') SAND, fine, little silt, little small pebbles, subround to subangular; poorly sorted; dry; pale brown (10YR 6/3).		
50	-50							(50.0'-51.0') SAND, medium, little small pebbles, subangular to subround; and SILT; dry; light olive brown (2.5Y 5/4).		
		11	50.0-55.0	5.0		X		(51.0'-52.0') SAND, fine, little small pebbles, subangular; and SILT; dry; gray (2.5Y 6/1).		
								(52.0'-53.0') SAND, medium; well sorted; dry; pale brown (10YR 4/1).		
								(53.0'-54.0') SILT, little clay, medium plasticity, slow dilatancy; little medium pebbles, subangular; moist; soft; dark gray (10YR 4/1). NOTE: Little sand.		
55	-55							(54.0'-61.0') SAND, fine; and SILT, non-plastic, rapid dilatancy; wet; dark gray (10YR 4/1).		
		12	55.0-60.0	5.0		X				
60	-60									

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs.  
 No odor or staining observed.  
 No recovery from 1.5'-10.0' bgs.



<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/29/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 97.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC14  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Partly Cloudy, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
		13	60.0-65.0	5.0	0.0	X		(61.0'-62.0') SILT, non-plastic, slow dilatancy; little sand; dry; hard; dark grayish brown (10YR 3/2).		
					0.0			(62.0'-73.0') SAND, fine; some silt, poorly sorted; wet; dark gray (10YR 4/1).		
65	-65				0.0	X				
		14	65.0-70.0	5.0	0.0	X				
					0.0					
70	-70				0.0	X				
		15	70.0-75.0	5.0	0.0	X				
					0.0					
75	-75				0.0	X		(73.0'-77.0') SILT, medium plasticity, rapid dilatancy; little sand; wet; medium stiff; dark gray (10YR 4/1).		
					0.0					

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs. No odor or staining observed. No recovery from 1.5'-10.0' bgs.
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**Date Start:** 7/29/2014  
**Date Finish:** 7/29/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 97.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HC14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Partly Cloudy, 70 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	16	75.0-80.0	5.0	0.0	X	(77.0'-78.5')	SAND; some silt; poorly sorted; wet; olive brown (2.5Y 4/4).		
					0.0	X	(78.5'-82.0')	SILT, low plasticity, rapid dilatancy; little sand; dry; stiff; dark gray (10YR 4/1).		
		17	80.0-85.0	3.4	0.0	X	(82.0'-95.0')	SAND, fine; and SILT, low plasticity, rapid dilatancy; wet; soft; dark yellowish brown (10YR 3/4).		
85	-85				0.0	X		NOTE: Hard, dry, SILT layer (0.25" thick) at 85.0' and 91.0' bgs.		
		18	85.0-90.0	5.0	0.0	X				
90	-90				0.0	X				
		19	90.0-95.5	5.0	0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs.  
 No odor or staining observed.  
 No recovery from 1.5'-10.0' bgs.



<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/29/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 97.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC14  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Partly Cloudy, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
95 - 95					0.0	X	[Dotted pattern]			
		20	95.0-97.5	2.5	0.0	X	[Horizontal lines]	(95.0'-97.5') BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
					0.0		[Horizontal lines]			
100-100								End of boring at 97.5' bgs.		
105-105										

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 54.0'-64.0', 62.0'-78.5' and 82.0'-95.0' bgs. No odor or staining observed. No recovery from 1.5'-10.0' bgs.
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**Date Start:** 7/16/2014  
**Date Finish:** 7/16/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 20.0  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0' bgs  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HC29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 65 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA		(0.0'-1.5') CONCRETE.			
					NA		(1.5'-4.0') SAND, medium to coarse, some medium pebbles, subangular; trace silt; poorly sorted; moist; very dark grayish brown (2.5Y 3/2).			
					0.0	X				
					0.0	X				
5	-5				0.0	X	(4.0'-5.5') CLAY, little silt, medium plasticity, slow dilatancy; trace very large pebbles, subround; dry medium stiff; light olive brown (2.5Y 5/4).			
		2	5.0-10.0	5.0	NA		(5.5'-10.0') CONCRETE.			
					NA					
					NA					
					NA					
10	-10				0.0		(10.0'-14.0') CLAY, medium plasticity, slow dilatancy; little sand, some large pebbles, subround; wet; soft; olive brown (2.5Y 4/6).			
		3	10.0-15.0	5.0	0.0	X				
					0.0					
					0.0					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs.  
 No odor or staining observed.  
 No recovery from 55.0'-60.0' bgs.




<b>Date Start:</b> 7/16/2014 <b>Date Finish:</b> 7/16/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 20.0 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 65 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	4	15.0-20.0	5.0	0.0			(14.0'-21.0') CLAY, little silt, medium plasticity, no dilatancy; little small pebbles, subangular to subround; dry; stiff; dark gray (10YR 4/1). NOTE: Till.		
	0.0									
	0.0									
	0.0									
20	-20	5	20.0-25.0	5.0	0.0			NOTE: Wet at 20.0' bgs.		
	0.0									
	0.0									
	0.0									
25	-25	6	25.0-30.0	5.0	0.0			(21.0'-21.5') SAND, medium, trace large pebbles, subround; trace silt; poorly sorted; wet; yellowish brown (10YR 5/6).		
	0.0									
	0.0									
	0.0									
					0.0			(21.5'-29.0') CLAY, little silt, high plasticity, no dilatancy; little small pebbles, subangular to subround; dry; medium stiff; dark gray (10YR 4/1). NOTE: Till.		

 Infrastructure · Water · Environment · Buildings	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs. No odor or staining observed. No recovery from 55.0'-60.0' bgs.
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<b>Date Start:</b> 7/16/2014 <b>Date Finish:</b> 7/16/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 20.0 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 65 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30				0.0	X	(29.0'-31.0') SAND, coarse; some medium pebbles, subangular; poorly sorted; dry; dark yellowish brown (10YR 4/6).			
		7	30.0-35.0	5.0	0.0	X	(31.0'-34.0') SAND, medium; well sorted; dry; very pale brown (10YR 7/4).			
					0.3	X	NOTE: Transition to very fine sand; little small pebbles, subround; at 33.5' bgs.			
					1.2	X	(34.0'-34.5') SAND and SILT; poorly sorted; dry; light olive brown (2.5Y 5/4).			
35	-35				0.3	X	(34.5'-35.0') SAND, medium; well sorted; dry; very pale brown (10YR 7/4).			
		8	35.0-40.0	5.0	1.3	X	(35.0'-35.5') SAND, very fine, little small pebbles, subangular to subround; little silt; poorly sorted; dry; light gray (2.5Y 7/1).			
					0.0	X	(35.5'-40.5') SAND, medium, little medium pebbles, subangular; trace silt; poorly sorted; dry; very pale brown (10YR 7/4).			
					0.2	X				
					0.1	X				
40	-40				0.0	X				
		9	40.0-45.0	5.0	0.2	X	(40.5'-44.0') SAND, fine, little small pebbles, subangular to subround; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).			
					0.6	X				
					0.2	X				
					0.1	X				
					0.1	X	(44.0'-44.5') PEBBLES, small, subangular; little sand, little granules, subangular to subround; poorly sorted; dry; gray (10YR 5/1).			
					0.2	X	(44.5'-45.0') SILT, low plasticity, rapid dilatancy; dry; soft; light olive brown (2.5Y 5/4).			

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs. No odor or staining observed. No recovery from 55.0'-60.0' bgs.
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<b>Date Start:</b> 7/16/2014 <b>Date Finish:</b> 7/16/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 20.0 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 65 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0.0		10	45.0-50.0	5.0		X	[Symbol]	(45.0'-48.0') PEBBLES, medium, subangular to subround; little small pebbles, subangular; little sand; poorly sorted; dry; light brownish gray (10YR 6/2).		
0.0						X	[Symbol]	(48.0'-49.5') SAND, coarse; some medium pebbles, subangular to subround; poorly sorted; dry; brown (10YR 5/3).		
0.0						X	[Symbol]	(49.5'-51.0') SILT, non-plastic, slow dilatancy; trace sand; dry; medium stiff; brown (10YR 5/3).		
0.0		11	50.0-55.0	5.0		X	[Symbol]	(51.0'-51.5') SILT, medium plasticity, no dilatancy; dry; very stiff; dark gray (10YR 4/1).		
0.0						X	[Symbol]	(51.5'-52.0') SAND, fine; little silt; poorly sorted; dry; very pale brown (10YR 7/4).		
0.0						X	[Symbol]	(52.0'-52.5') SILT, low plasticity, slow dilatancy; trace sand; dry; medium stiff; dark gray (10YR 4/1).		
0.0						X	[Symbol]	(52.5'-53.0') SILT, low plasticity; some sand, trace granules, subangular; dry; soft; light olive brown (2.5Y 5/4).		
0.0						X	[Symbol]	(53.0'-55.0') SAND, medium, trace granules, angular; trace silt; poorly sorted; dry; very pale brown (10YR 7/4).		
0.0		12	55.0-60.0	0.0		X	[Symbol]	(55.0'-60.0') NO RECOVERY.		
0.0							[Symbol]	(60.0'-63.0') SAND and SILT; dry; very pale brown (10YR 7/4).		
1.2							[Symbol]			

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs. No odor or staining observed. No recovery from 55.0'-60.0' bgs.
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<b>Date Start:</b> 7/16/2014 <b>Date Finish:</b> 7/16/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 20.0 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 65 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	13	60.0-65.0	5.0	0.2	X				
					0.1			(63.0'-66.0') SAND, medium; well sorted; moist; dark yellowish brown (10YR 4/6).		
					0.3					
					0.2	X				
		14	65.0-70.0	5.0	0.0	X		(66.0'-67.5') SAND and SILT, little large pebbles, subround; wet; dark grayish brown (10YR 4/2).		
					0.0			(67.5'-72.5') SAND and SILT; wet; very dark grayish brown (10YR 3/2).		
					0.0					
					0.0					
70	-70	15	70.0-80.0	10.0	0.0	X				
					0.0			(72.5'-75.5') SILT, low plasticity, no dilatancy; dry; hard; dark gray (10YR 4/1).		
					0.0	X		(73.5'-75.5') SAND and SILT; wet; very dark grayish brown (10YR 3/2).		
					0.0					
					0.0			(75.5'-76.5') SILT, low plasticity, no dilatancy; dry; hard; dark gray (10YR 4/1).		
					0.0	X		(76.5'-78.5') SAND and SILT; wet; very dark grayish brown (10YR 3/2).		
					0.0					

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs. No odor or staining observed. No recovery from 55.0'-60.0' bgs.
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<b>Date Start:</b> 7/16/2014 <b>Date Finish:</b> 7/16/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 20.0 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 90.0' bgs <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HC29  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 65 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	16	80.0-90.0	10.0		X		(78.5'-79.5') SILT, low plasticity, no dilatancy; dry; hard; dark gray (10YR 4/1).		
								(79.5'-81.0') SAND and SILT; wet; very dark grayish brown (10YR 3/2).		
						X		(81.0'-87.0') SILT, low plasticity, rapid dilatancy; some sand; wet; stiff; dark yellowish brown (10YR 4/4).		
						X		(87.0'-90.0') BEDROCK. (weather sandstone) NOTE: Grand River formation.		
90	-90					X		End of boring at 90.0' bgs.		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 10.0'-14.0', at 20.0', from 21.0'-21.5', 66.0'-72.5', 73.5'-75.5', 76.5'-78.5', 79.5'-87.0' bgs. No odor or staining observed. No recovery from 55.0'-60.0' bgs.
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<b>Date Start:</b> 7/25/2014 <b>Date Finish:</b> 7/25/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HH19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 77 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	4.1	NA			(0.0'-1.5') CONCRETE.		
					0.0			(1.5'-17.0') SILT, low plasticity, slow dilatancy; some sand, little medium pebbles, subround to subangular; dry; hard; light olive brown (2.5Y 5/4). NOTE: Fill.		
					0.0	X				
					0.0	X				
5	-5	2	5.0-10.0	5.0						
					0.0					
					0.0	X				
					0.0	X				
10	-10	3	10.0-15.0	5.0						
					0.0					
					0.0	X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs. No odor or staining observed.
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**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 77 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	4	15.0-20.0	5.0	0.0	X				
20	-20	5	20.0-25.0	5.0	0.0	X		(17.0'-22.0') CLAY, some silt, low plasticity, slow dilatancy; little sand, little small pebbles, subangular to subround; dry; medium stiff; dark gray (10YR 4/1). NOTE: Till.		
25	-25	6	25.0-30.0	5.0	0.0	X		(22.0'-30.0') CLAY, little silt, high plasticity, no dilatancy; little sand, trace small pebbles; dry; soft; dark gray (10YR 4/1). NOTE: Till.		


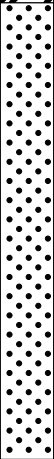




**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 77 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	7	30.0-35.0	5.0	0.0	X		(30.0'-36.0') SAND, fine; little silt; poorly sorted; moist; pale brown (2.5Y 7/3).		
	0.0				X					
	0.0				X					
35	-35	8	35.0-40.0	5.0	0.0	X		(36.0'-38.0') PEBBLES, large, subround; some sand; poorly sorted; moist; very dark grayish brown (2.5Y 3/2).		
	0.0				X					
	0.0				X					
40	-40	9	40.0-45.0	5.0	0.0	X		(38.0'-45.5') SAND, medium, little small pebbles, subangular to subround; little silt; poorly sorted; dry; light olive brown (2.5Y 5/4).		
	0.0				X					
	0.0				X					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs.  
 No odor or staining observed.



<b>Date Start:</b> 7/25/2014 <b>Date Finish:</b> 7/25/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HH19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 77 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0.0						X		(45.5'-46.5') SILT, low plasticity, rapid dilatancy; some sand; dry; medium stiff; dark gray (10YR 4/1).		
0.0		10	45.0-50.0	5.0		X		(46.5'-56.0') SAND; little pebbles, subangular to subround; some silt; poorly sorted; dry; light olive brown (2.5Y 5/3).		
0.0						X				
0.0						X				
50	-50					X				
0.0		11	50.0-55.0	5.0		X				
0.0						X				
0.0						X				
55	-55					X				
0.0		12	55.0-60.0	5.0		X		(56.0'-60.0') SAND, fine, little medium pebbles, subround; trace very large pebbles, subround; and SILT, low plasticity, rapid dilatancy; moist; dark gray (10YR 4/1). NOTE: Till.		
0.0						X				
0.0						X				
60	-60					X		(60.0'-72.0') SAND, fine; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
0.0						X				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs. No odor or staining observed.
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**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 77 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	13	60.0-65.0	5.0	0.0	X	[Dotted pattern]			
					0.0	X				
					0.0	X				
		14	65.0-70.0	5.0	0.0	X	[Dotted pattern]	NOTE: Hard, dry, SILT layer (0.25" thick) at 67.0' bgs.		
					0.0	X				
					0.0	X				
70	-70				0.0	X	[Vertical lines pattern]	(72.0'-75.0') SILT, low plasticity, slow dilatancy; trace sand; dry; very hard; dark gray (10YR 4/1).		
		15	70.0-75.0	5.0	0.0	X				
					0.0	X				
75	-75				0.0	X	[Dotted pattern]	(75.0'-85.0') SAND, fine; and SILT, low plasticity, rapid dilatancy; well sorted; wet; dark gray (10YR 4/1).		
					0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH19  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 77 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	16	75.0-80.0	5.0	0.0	X		NOTE: Hard, dry, SILT layers (0.25" thick) at 77.0' and 80.0' bgs.		
					0.0	X				
		17	80.0-85.0	5.0	0.0	X				
					0.0	X				
85	-85				0.0	X		(85.0'-92.5') SILT, medium plasticity, slow dilatancy; some sand; wet; hard; brown (10YR 4/3).		
		18	85.0-90.0	5.0	0.0	X				
					0.0	X				
90	-90				0.0	X		(92.5'-95.0') BEDROCK (weathered sandstone). NOTE: Grand River Formation.		
		19	90.0-95.5	5.0	0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs.  
 No odor or staining observed.



<b>Date Start:</b> 7/25/2014 <b>Date Finish:</b> 7/25/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HH19  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 77 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
95-95					0.0 0.0	X	HH HH HH	End of boring at 95.0' bgs.		

	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 60.0'-72.0', 75.0'-84.0', and 85.0'-92.5' bgs. No odor or staining observed.
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**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA			(0.0'-0.3') CONCRETE.		
					NA			(0.3'-5.0') CLAY, some silt, medium plasticity; little small to medium pebbles, subround; dry medium stiff; light olive brown (12.5YR 5/3).		
					NA					
					NA					
5	-5				0.0			(5.0'-7.0') SILT and SAND, little medium pebbles, angular; little clay; poorly sorted; wet; light olive brown (2.5Y 5/3).		
		2	5.0-10.0	5.0	0.0			(7.0'-15.0') CLAY, little silt, medium plasticity, little small to medium pebbles, subangular to subround; stiff; dry; light olive brown (2.5Y 5/3).		
					0.0					
					0.0					
10	-10				0.0			NOTE: Wet sand seam at 9.5' bgs.		
					0.0					
		3	10.0-15.0	5.0	0.0					
					0.0					

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.



**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
15	-15	4	15.0-20.0	5.0	0.0	X		(15.0'-21.5') CLAY, trace silt, high plasticity, no dilatancy; little small to large pebbles, subround; dry; stiff; dark gray (10YR 4/1).		
					0.0	X		NOTE: Transition to medium stiff at 19.0' bgs.		
		5	20.0-25.0	5.0	0.0	X		(21.5'-22.5') SAND and SILT; poorly sorted; wet; light olive brown (2.5Y 5/6).	▼	
					0.0	X		(22.5'-23.5') SAND, medium, trace granules, subangular to subround; little silt; well sorted; wet; light olive brown (2.5Y 5/6).		
25	-25	6	25.0-30.0	5.0	0.0	X		(23.5'-32.0') CLAY, low to medium plasticity, slow dilatancy; little small pebbles, subround; dry; stiff; dark grayish brown (2.5Y 4/2). NOTE: Glacial Till.		
					0.0	X		NOTE: Transition to little medium pebbles and medium stiff at 25.0' bgs.		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.



**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
30	-30	7	30.0-38.0	8.0	0.0	X				
	0.1				X					
	0.2				X					
	0.2				X		(32.0'-34.0') SAND, medium, trace silt; well sorted; dry; light yellowish brown (2.5Y 6/4).			
	0.4				X					
35	-35				0.1	X		(34.0'-36.0') SAND, very fine, little small to medium pebbles, subround; little silt; poorly sorted; dry; very pale brown (10YR 7/3).		
					3.9	X				
					4.2	X		(36.0'-37.5') PEBBLES, small, some medium sand, subround; poorly sorted; dry; light yellowish brown (10YR 6/4).		
					1.0	X		(37.5'-38.0') SAND, medium; well sorted; dry; light yellowish brown (2.5Y 6/4).		
40	-40	8	38.0-45.0	6.0	0.6	X		(38.0'-42.5') SAND, very fine, some medium pebbles, subround; little silt; dry; very pale brown (10YR 7/3). NOTE: High PIDs may be a result of very hot core samples from drilling.		
					X					
					X					
					X		46.5			
					X		0.0			
					0.0	X		(42.5'-43.0') SILT, non-plastic, rapid dilatancy; some sand; moist; stiff; light yellowish brown (2.5Y 6/4).		
					0.0	X		(43.0'-45.0') SAND, very fine, some medium pebbles, subround; little silt; dry; very pale brown (10YR 7/3).		
					0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.



**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
45.0	-50.0	9	45.0-50.0	5.0		X	(45.0'-48.5') SAND, medium, little fine sand, some granules to very plarge pebbles, subround; little silt; poorly sorted; dry; very pale brown (10YR 7/3).			
48.5	-49.0					X	(48.5'-49.0') SILT, non-plastic, rapid dilatancy; little sand; dry; soft; light yellowish brown (2.5Y 6/4).			
49.0	-50.0					X	(49.0'-50.0') SAND, fine; well sorted; dry; very pale brown (10YR 7/3).			
50.0	-50.0	10	50.0-55.0	5.0		X	(50.0'-53.0') PEBBLES, large, subround; some fine sand, little small pebbles, subround; poorly sorted; dry; very pale brown (10YR 7/3).			
53.0	-53.5					X	(53.0'-53.5') SAND, fine, trace granules, subangular to subround; some silt; poorly sorted; light yellowish brown (2.5Y 6/4).			
53.5	-54.0					X	(53.5'-54.0') SAND, very fine; well sorted; dry; pale brown (10YR 7/3).			
54.0	-55.0					X	(54.0'-55.0') SAND, fine; some silt; poorly sorted; dry; light grayish brown (2.5Y 6/4).			
55.0	-55.0	11	55.0-60.0	5.0		X	(55.0'-58.0') PEBBLES, medium, angular to subangular; some fine sand, trace small pebbles, subround; trace silt; poorly sorted; very pale brown (10YR 7/3).			
58.0	-60.0					X	(58.0'-60.0') SAND and SILT; trace small pebbles, subround; poorly sorted; dry; dark gray (2.5Y 4/1).			
60.0	-60.0					X	(60.0'-62.5') SAND, fine, trace granules, subangular to subround; some silt; poorly sorted; dry; light yellowish brown (2.5Y 6/3).			

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.



**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy 75 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
65	-65	12	60.0-65.0	0.0	0.1	X	[Pattern: Dotted]			
					0.4	X	[Pattern: Dotted]	(62.5'-64.5') PEBBLES, medium, angular to subangular; some fine sand; little small pebbles, subround; dry; poorly sorted; very pale brown (10YR 7/3).		
					0.4	X	[Pattern: Dotted]	(64.5'-65.0') SILT and SAND, little small pebbles, angular; poorly sorted; grayish brown (2.5Y 5/2).		
					0.4	X	[Pattern: Dotted]	(65.0'-73.0') SILT and SAND; poorly sorted; wet; dark gray (2.5Y 4/1). NOTE: Lacustrine, laminations.		
		13	65.0-70.0	5.0	0.2	X	[Pattern: Dotted]			
					0.5	X	[Pattern: Dotted]			
					0.6	X	[Pattern: Dotted]			
70	-70				0.4	X	[Pattern: Dotted]			
		14	70.0-80.0	10.0	0.9	X	[Pattern: Dotted]			
					0.0	X	[Pattern: Dotted]	(73.0'-75.0') SILT, trace clay, high plasticity, no dilatancy; trace sand; dry; hard; dark gray (2.5Y 4/1).		
					0.0	X	[Pattern: Dotted]	(75.0'-78.0') SILT and SAND; poorly sorted; wet; dark gray (2.5Y 4/1).		
75	-75				0.0	X	[Pattern: Dotted]			
					0.0	X	[Pattern: Dotted]			

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.



<b>Date Start:</b> 7/14/2014 <b>Date Finish:</b> 7/14/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> J.Greer/G.Hampton <b>Drilling Method:</b> Continuous <b>Sampling Method:</b> 5", 10' core barrel <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> 21.5 <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 95.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> A.Richmond	<b>Well/Boring ID:</b> SB-HH24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy 75 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	15	80.0-90.0	10.0		X		(78.0'-80.0') SILT, little clay, medium plasticity, slow dilatancy; dry; hard; dark gray (10YR 4/1).		
						X		(80.0'-81.0') SAND, medium; little silt; well sorted; wet; olive brown (2.5Y 4/4).		
						X		(81.0'-88.0') SILT, little clay, low plasticity, rapid dilatancy; trace sand; wet; stiff; brown (10YR 4/3).		
						X		NOTE: Transition to little sand at 82.0' bgs.		
						X		NOTE: Transition to hard at 85.0' bgs.		
						X		NOTE: Transition to stiff with little sand at 86.0' bgs.		
						X		(88.0'-92.0') SILT, non-plastic, rapid dilatancy; little sand; dry; hard; brown (10YR 4/3).		
90	-90	16	90.0-95.0	5.0		X		(92.0'-95.0') SANDSTONE, weathered bedrock.		

 <p><b>ARCADIS</b> Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'. No odor or staining observed.
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**Date Start:** 7/14/2014  
**Date Finish:** 7/14/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/G.Hampton  
**Drilling Method:** Continuous  
**Sampling Method:** 5", 10' core barrel  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** 21.5  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy 75 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
					0.0	X	H			
					0.0	X	H			
95-95								End of boring at 95.0' bgs.		
100-100										
105-105										



**Remarks:** bgs = below ground surface  
 Groundwater encountered from 5.0'-7.0', at 9.5', from 21.5'-23.5', 65.0'-73.0', 75.0'-78.0', 80.0'-88.0'.  
 No odor or staining observed.

**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Pace/S.Grass  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 65 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA		(0.0'-1.5') CONCRETE.			
					0.0	X	(1.5'-15.0') SILT, low plasticity, slow dilatancy; some sand, little medium pebbles, subangular to subround; dry; very hard; dark yellowish brown (10YR 4/4). NOTE: Fill.			
5	-5	2	5.0-10.0	4.0	0.0	X				
					0.0	X				
10	-10	3	10.0-15.0	3.9	0.0	X	(15.0'-19.0') CLAY, high plasticity, no dilatancy; little sand; little medium pebbles, subround to subangular; dry; medium stiff; dark gray (10YR 4/1). NOTE: Till.			
					0.0	X				
					0.0	X				
15	-15				0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 20.0'-25.0', 28.0'-30.0', 42.0'-46.0', 62.0'-65.0', 70.0'-75.0', and 80.0'-86.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Pace/S.Grass  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 65 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	4.2	0.0	X		(19.0'-20.0') SAND, medium, trace small pebbles, subround to subangular; little silt; poorly sorted; dry; light yellowish brown (10YR 6/4).		
								(20.0'-25.0') SAND, medium; some slit; well sorted; wet; light olive brown (2.5Y 5/4).		
25	-25	5	20.0-25.0	4.3	0.0	X		(25.0'-27.0') SAND, medium; and SILT, medium plasticity; dry; olive brown (2.5Y 4/4).		
								(27.0'-28.0') SAND, fine; trace granules, subround to subangular; some silt; poorly sorted; dry; light yellowish brown (2.5Y 6/3).		
								(28.0'-30.0') SAND, medium; little silt; well sorted; wet; light olive brown (2.5Y 5/4).		
30	-30	6	25.0-30.0	2.8	0.0	X		(30.0'-37.0') CLAY, high plasticity, slow dilatancy; little sand; little medium pebbles, subangular to subround; dry; stiff; dark gray (10YR 4/1). NOTE: Till.		
35	-35	7	30.0-35.0	4.5	0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 20.0'-25.0', 28.0'-30.0', 42.0'-46.0', 62.0'-65.0', 70.0'-75.0', and 80.0'-86.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Pace/S.Grass  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 65 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	5.0	0.0	X		(37.0'-42.0') SILT, little clay, medium plasticity, slow dilatancy; little sand; moist; stiff; dark gray (10YR 4/1). NOTE: Trace medium pebbles, subangular to subround.		
45	-45	9	40.0-45.0	4.5	0.0	X		(42.0'-46.0') CLAY, high plasticity, rapid dilatancy; and SAND, medium; wet; dark gray (10YR 4/1).		
		10	45.0-48.0	3.0	0.0	X		(46.0'- 48.0') SAND, medium; little small pebbles, subround to subangular; poorly sorted; little silt; dry; light olive brown (2.5Y 4/4).		
50	-50	11	48.0-50.0	2.0	0.0	X		(48.0'-52.0') SAND, medium; little small pebbles, subangular to subround; and SILT, trace clay, low plasticity, rapid dilatancy; poorly sorted; moist; olive brown (2.5Y 4/4).		
		12	50.0-55.0	5.0	0.0	X		(52.0'-53.0') SAND, medium; little medium pebbles, subround to subangular; little silt; poorly sorted; dry; light; olive brown (2.5Y 5/4).		
					0.0	X		(53.0'-54.0') SILT, non-plastic, rapid dilatancy; some sand; moist; soft; olive brown (2.5Y 4/4).		
55	-55				0.0	X		(54.0'-55.0') SAND, medium; little small pebbles, subround to subangular; some silt; poorly sorted; dry; light olive brown (2.5Y 5/4).		
					0.0	X		(55.0'-58.0') SAND, coarse, subangular to subround; some medium pebbles, subround; and SILT; poorly sorted; dry; dark yellowish brown (10YR 4/6).		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 20.0'-25.0', 28.0'-30.0', 42.0'-46.0', 62.0'-65.0', 70.0'-75.0', and 80.0'-86.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Pace/S.Grass  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 65 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	13	55.0-60.0	3.9	0.2	X		(58.0'-60.0') SAND, medium; little silt; well sorted; dry; light yellowish brown (2.5Y 6/3).		
								(60.0'-62.0') SAND, very fine; little small pebbles, subangular; little silt; poorly sorted; dry; light brownish gray (10YR 6/2).		
65	-65	14	60.0-65.0	3.7	0.0	X		(62.0'-65.0') SAND, medium; little medium pebbles, subround to subangular; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
								(65.0'-68.0') SAND, coarse, subround to subangular; some medium pebbles, subround; and SILT; dry; dark yellowish brown (10YR 4/4).		
70	-70	15	65.0-70.0	3.8	0.0	X		(68.0'-70.0') SAND, very fine little small pebbles, subangular; some silt; poorly sorted; light brownish gray (10YR 6/2).		
								(70.0'-75.0') SILT, medium plasticity, rapid dilatancy; and SAND, fine; trace small pebbles, subround to subangular; wet; dark gray (10YR 4/1).		
75	-75	16	70.0-75.0	2.1	0.0	X				
		17	75.0-80.0	4.1	0.2	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 20.0'-25.0', 28.0'-30.0', 42.0'-46.0', 62.0'-65.0', 70.0'-75.0', and 80.0'-86.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/28/2014  
**Date Finish:** 7/28/2014  
**Drilling Company:** Cascade  
**Driller's Name:** J.Greer/B.Pace/S.Grass  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 90.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HH29  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 65 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	18	80.0-85.0	3.8	0.1	X	[Dotted pattern]	(80.0'-86.0') SILT, low plasticity, rapid dilatancy; some sand; wet; soft; dark yellowish brown (10YR 4/4).  NOTE: Hard, dry silt layers at 81.0' and 86.0' bgs.		
85	-85				0.0	X	[Vertical lines]			
		19	85.0-90.0	5.0	0.0	X	[Horizontal lines]	(86.0'-90.0') BEDROCK (weathered sandstone). NOTE: Grand River Formation; some silt in bedrock.		
90	-90				0.0			End of boring at 90.0' bgs.		
95	-95									

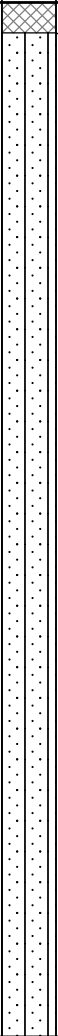
**Remarks:** bgs = below ground surface  
 Groundwater encountered from 20.0'-25.0', 28.0'-30.0', 42.0'-46.0', 62.0'-65.0', 70.0'-75.0', and 80.0'-86.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 94.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HH34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction	
0	0										
0.5		1	0.0-5.0	4.1		X		(0.0'-0.5') CONCRETE.  (0.5'-20.0') SAND, fine to very fine; trace gravel to small cobbles, subround; poorly sorted; and SILT, some clay, medium plasticity, no dilatancy, stiff to very stiff; dry to moist; yellowish brown (10YR 5/4).			
5	-5	2	5.0-10.0	4.5		X					
10	-10	3	10.0-15.0	5.0		X					
15	-15				0.2	X					

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.  
 NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 94.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HH34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	4.7		X				
					0.3	X				
		5	20.0-25.0	4.6		X	(20.0'-25.0') SAND, medium to very fine; trace gravel to small to medium pebbles, subround; some silt, slow dilatancy; moist; dark yellowish brown (10YR 4/6).			
25	-25				0.3	X				
		6	25.0-30.0	4.7		X	(25.0'-29.0') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT, slow dilatancy; moist; medium stiff to stiff; yellowish brown (10YR 5/4).			
30	-30				0.2	X				
		7	30.0-35.0	5.0		X	(29.0'-40.0') SAND, fine to very fine; trace gravel to large pebbles, subround; and SILT, little clay, low to medium plasticity, slow dilatancy; moist; stiff; dark grayish brown (10YR 4/2).			
35	-35				0.1	X				
						X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.  
 NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Eastings:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 94.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HH34  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Cloudy, 67 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	4.8		X				
45	-45	9	40.0-45.0	4.7	0.2	X		(40.0'-50.0') SAND, fine to very fine; little to trace gravel to medium pebbles, subround; and SILT, slow dilatancy; dry; medium stiff.		
50	-50	10	45.0-50.0	2.6	0.1	X				
55	-55	11	50.0-55.0	4.2	2.5	X		(50.0'-61.0') SAND, medium to very fine; trace granules to medium pebbles, subround; some silt, slow dilatancy; moist; medium stiff; grayish brown (10YR 5/2).		

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.  
 NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.




<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/30/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Eastings:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 94.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-HH34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 67 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	55.0-60.0	4.4	0.5	X				
		13	60.0-65.0	4.4	1.0	X		(61.0'-64.5') SAND, coarse to fine; some gravel to large pebbles, subround; poorly sorted; moist; dark yellowish brown (10YR 4/4).		
65	-65	14	65.0-70.0	4.7	1.0	X		(64.5'-72.0') SAND, fine to very fine; trace gravel to medium pebbles, subround; some silt, slow dilatancy; moist; medium stiff; light olive brown (2.5Y 5/3).		
70	-70	15	70.0-75.0	4.8	0.5	X		(72.0'-85.0') SAND, fine to very fine; trace gravel to small pebbles, subround; and SILT, little to trace clay, low plasticity, slow dilatancy; moist; stiff to very stiff; dark gray (10YR 4/1).		
75	-75					X				

	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed. NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.
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<b>Date Start:</b> 7/29/2014 <b>Date Finish:</b> 7/30/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 94.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-HH34  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Cloudy, 67 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	16	75.0-80.0	4.8		X				
					0.5					
		17	80.0-85.0	5.0		X		NOTE: Color change to brown (7.5YR 5/3) at 82.0' bgs.		
85	-85				0.7	X		NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.		
						X		(85.0'-86.0') SAND, fine to very fine; and SILT, slow dilatancy; and BEDROCK, weathered sandstone; trace gravel (foreign) to large pebbles, subround; moist; medium stiff to stiff; gray (7.5YR 5/1).		
		18	85.0-90.0	4.5		X		(86.0'-94.0') BEDROCK, weathered sandstone; and SAND, fine to vey fine; trace gravel (foreign) to large pebbles, subround; little silt; gray (7.5YR 6/1).		
90	-90				0.2	X				
						X				
		19	90.0-94.0	3.3		X				
					0.8	X				
95	-95							End of boring at 94.0' bgs.		

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed. NOTE: 85.0'-94.0' interval affected by drilling water downhole, approx. 150 gallons of water had to be used to extranet downhole equipment; no other intervals affected.
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**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HM14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
		1	0.0-5.0	5.0	NA			(0.0'-1.5') CONCRETE.		
					0.0			(1.5'-3.0') SAND, subangular to subround; some small pebbles, subround; poorly sorted; wet; dark yellowish brown (10YR 4/4). NOTE: Fill.		
					0.0	X		(3.0'-15.0') SILT, trace clay, non-plastic, rapid dilatancy; some sand; little small pebbles; dry; hard; dark yellowish brown (10YR 4/4). NOTE: Fill.		
5	-5	2	5.0-10.0	5.0		X				
					0.0	X				
					0.0	X				
10	-10	3	10.0-15.0	5.0		X				
					0.0	X				
					0.0	X				
15	-15					X		(15.0'-21.0') SILT, medium plasticity, slow dilatancy; little sand; some large pebbles, angular; dry; hard; brown (10YR 4/3). NOTE: Fill.		
					0.0	X				
					0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 1.5'-3.0', 64.5'-70.0', 74.0'-81.0' and 81.0'-91.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HM14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	5.0	0.0	X				
					0.0	X		(21.0'-22.0') SAND, medium; well sorted; dry; light brownish gray (10YR 6/2).		
		5	20.0-25.0	4.0	0.0	X		(22.0'-30.0') CLAY, high plasticity, slow dilatancy; little sand; little small pebbles, subangular; dry; soft; dark gray (10YR 4/1).		
25	-25				0.0	X				
		6	25.0-30.0	3.6	0.0	X				
					0.0	X				
30	-30				0.0	X		(30.0'-43.0') SAND, medium; little granules, subround to subangular; trace silt; well sorted; dry; very pale brown (10YR 7/3).		
		7	30.0-35.0	3.9	0.0	X				
					0.0	X				
35	-35				0.0	X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 1.5'-3.0', 64.5'-70.0', 74.0'-81.0' and 81.0'-91.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HM14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	5.0	0.0	X				
					0.0	X				
		9	40.0-45.0	5.0	0.0	X				
					0.0	X				
45	-45				0.0	X		(43.0'-44.0') PEBBLES, medium; little sand, subround to subangular; poorly sorted; dry; olive brown (2.5Y 4/4).		
					0.0	X		(44.0'-45.0') SAND, fine; and SILT, non-plastic, rapid dilatancy; moist; light olive brown (2.5Y 5/4).		
					0.0	X		(45.0'-46.0') SAND, medium; little small pebbles, subround to subangular; poorly sorted; light brownish gray (10YR 6/2).		
		10	45.0-50.0	5.0	0.0	X		(46.0'-47.0') PEBBLES, large, subround; little sand; poorly sorted; dry; olive brown (2.5Y 4/4).		
					0.0	X		(47.0'-56.0') SAND, fine; little small pebbles, subangular; little silt; poorly sorted; dry; pale brown (10YR 6/3).		
50	-50				0.0	X				
					0.0	X				
		11	50.0-60.0	8.4	0.0	X				
					0.0	X				
55	-55				0.0	X				
					0.0	X				
					0.0	X		(56.0'-57.0') SAND, fine; little medium pebbles, subround; some silt; poorly sorted; dry; dark gray (10YR 4/1).		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 1.5'-3.0', 64.5'-70.0', 74.0'-81.0' and 81.0'-91.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HM14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	60.0-80.0		0.0	X				
					0.0	X		(60.0'-64.5') PEBBLES, medium, subround; little sand; little silt; poorly sorted; dry; light olive brown (2.5Y 5/4).		
					0.0	X		(64.5'-70.0') SAND, fine; and SILT, non-plastic, rapid dilatancy; wet; dark gray (10YR 4/1).		
65	-65					X				
						X				
70	-70					X		(70.0'-74.0') SILT, low plasticity, rapid dilatancy; some sand; moist; soft; dark gray (10YR 4/1).		
						X		NOTE: Hard, dry silt layer 0.25' thick at 73.5' bgs.		
						X		(74.0'-81.0') SAND; some silt; poorly sorted; wet; dark gray (10YR 4/1).		
75	-75					X				

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 1.5'-3.0', 64.5'-70.0', 74.0'-81.0' and 81.0'-91.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/29/2014  
**Date Finish:** 7/30/2014  
**Drilling Company:** Cascade  
**Driller's Name:** B.Price/J.Greer/S.Gross  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 95.0  
**Surface Elevation:**  
**Descriptions By:** A.Richmond

**Well/Boring ID:** SB-HM14  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Cloudy, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	13	80.0-90.0	8.4		X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]	(81.0'-91.0') SILT, low plasticity, rapid dilatancy; some sand; wet; stiff; dark yellowish brown (10YR 4/4). NOTE: Intermittent layers of dry, hard silt 0.25' thick.		
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
85	-85					X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
					0.0	X	[Dotted Pattern]			
90	-90	14	90.0-95.0	5.0		X	[Horizontal Lines]	(91.0'-95.0') BEDROCK, weathered sandstone. NOTE: Grand River Formation.		
						X	[Horizontal Lines]			
						X	[Horizontal Lines]			
						X	[Horizontal Lines]			
95	-95					X	[Horizontal Lines]	End of boring at 95.0' bgs.		

**Remarks:** bgs = below ground surface  
 Groundwater encountered from 1.5'-3.0', 64.5'-70.0', 74.0'-81.0' and 81.0'-91.0' bgs.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 87.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HM24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
0	0									
0.0		1	0.0-5.0	4.10	NA	X		(0.0'-0.5') CONCRETE.		
0.0						X		(0.5'-4.5') SAND, fine to very fine; little granules to large pebbles, subround; and SILT, little clay, low plasticity, slow dilatancy; dry to moist; medium stiff to stiff; yellow brown (10YR 5/6).		
0.0						X		(4.5'-5.0') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT and CLAY, medium to high plasticity, slow dilatancy; dry to moist; soft to medium stiff; dark gray (10YR 5/2). NOTE: Trace roots, very fine.		
5.0	-5	2	5.0-10.0	5.0		X		(5.0'-14.0') SAND, fine to very fine; trace granules to large pebbles, subround; and SILT, little clay, low plasticity, very slow dilatancy; dry to moist; stiff; dark yellow brown (10YR 4/4).		
0.0						X				
0.0						X				
10.0	-10	3	10.0-15.0	5.0		X		(14.0'-15.0') SAND, fine to very fine; trace granules to large pebbles, subround; and SILT and CLAY, medium plasticity, slow dilatancy; dry to moist; stiff; dark gray brown (10YR 4/2).		
0.0						X				
0.0						X		(15.0'-19.5') CLAY and SILT, medium plasticity, slow dilatancy; some very fine to fine sand; trace granules to medium pebbles, subround; dry to moist; medium stiff; dark gray brown (10YR 4/1).		
15.0	-15									

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
**Borehole Depth (ft. bgs.):** 87.0  
**Surface Elevation:**  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HM24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
**Weather Conditions:** Sunny, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
20	-20	4	15.0-20.0	4.10	0.0	X				
					0.0	X		(19.5'-20.5') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT and CLAY, medium plasticity, slow dilatancy; dry to moist; medium stiff; dark gray brown (10YR 4/2).		
		5	20.0-25.0	5.0	0.0	X		(20.5'-22.0') SAND, medium to very fine; trace granules to medium pebbles, subround; and SILT, little clay, medium plasticity, slow dilatancy; slightly moist; medium stiff; gray to pale brown (10YR 6/3).		
					0.0	X		(22.0'-24.0') SAND, medium to very fine; trace gravel to small to medium pebbles, subround; little silt; slightly moist; yellow brown (10YR 5/6).		
25	-25				0.0	X		(24.0'-26.0') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT, slow dilatancy, moist; medium stiff; dark yellow brown (10YR 4/4).		
		6	25.0-30.0	4.8	0.0	X		(26.0'-28.0') SAND, medium to very fine; little silt; moist; brown (10YR 5/3).		
					0.0	X		(28.0'-31.0') SAND, fine to very fine; little granules to medium pebbles, subround; some clay and silt, medium plasticity, slow dilatancy; dry to moist; medium stiff; dark gray (10YR 4/1).		
30	-30				0.0	X		(31.0'-35.5') SAND, fine to very fine; trace granules to medium pebbles, subround; and SILT, some clay, medium plasticity, slow dilatancy; medium stiff to stiff; dark gray (10YR 4/1).		
		7	30.0-35.0	4.10	0.0	X		(35.5'-54.5') SAND, medium to very fine; small pebbles, subround; moist; yellowish brown (10YR 5/4).		
35	-35				0.0	X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 87.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HM24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 70 F

DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
40	-40	8	35.0-40.0	4.6	0.0	X		NOTE: Trace granules to large pebbles to very large pebbles, subround from 45.0'-46.0' bgs.		
		9	40.0-45.0	4.5	0.0	X				
45	-45				0.0	X				
		10	45.0-50.0	4.8	0.0	X				
50	-50				0.0	X				
55	-55	11	50.0-55.0	4.6	0.0	X		(54.5'-60.0') SAND, fine to very fine; trace granules to small pebbles, subround; and SILT, slow dilatancy; slightly moist; medium stiff; light yellowish brown (2.5Y 6/4).		
					0.0	X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



**Date Start:** 7/25/2014  
**Date Finish:** 7/25/2014  
**Drilling Company:** Cascade  
**Driller's Name:** A.Roberts  
**Drilling Method:** Sonic  
**Sampling Method:** Continuous  
**Rig Type:** Sonic  
**Water Level Start (ft. bgs.):** NA  
**Water Level Finish (ft. btoc.):** NA

**Northing:**  
**Easting:**  
**Casing Elevation:** NA  
  
**Borehole Depth (ft. bgs.):** 87.0  
**Surface Elevation:**  
  
**Descriptions By:** K.Hasbrouck

**Well/Boring ID:** SB-HM24  
**Client:** RACER  
**Location:** RACER Lansing Plant 3  
  
**Weather Conditions:** Sunny, 70 F


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headpace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
60	-60	12	55.0-60.0	3.4	0.0	X				
					0.0	X		(60.0'-63.5') SAND, medium to very fine; little granules to large pebbles, subround; little silt; slightly moist; light olive brown (2.5Y 5/3).		
		13	60.0-65.0	4.6	0.0	X				
65	-65				0.0	X		(63.5'-84.0') SAND, fine to very fine; trace granules to small to medium pebbles, subround; and SILT, slow dilatancy; slightly moist; medium stiff; dark gray brown (10YR 4/2).		
		14	65.0-70.0	4.10	0.0	X				
70	-70				0.0	X				
		15	70.0-75.0	4.6	0.0	X				
					0.0	X				
75	-75				0.0	X				
		16	75.0-80.0	4.8	0.0	X				
					0.0	X				

**Remarks:** bgs = below ground surface  
 No groundwater encountered.  
 No odor or staining observed.



<b>Date Start:</b> 7/25/2014 <b>Date Finish:</b> 7/25/2014 <b>Drilling Company:</b> Cascade <b>Driller's Name:</b> A.Roberts <b>Drilling Method:</b> Sonic <b>Sampling Method:</b> Continuous <b>Rig Type:</b> Sonic <b>Water Level Start (ft. bgs.):</b> NA <b>Water Level Finish (ft. btoc.):</b> NA	<b>Northing:</b> <b>Easting:</b> <b>Casing Elevation:</b> NA  <b>Borehole Depth (ft. bgs.):</b> 87.0 <b>Surface Elevation:</b>  <b>Descriptions By:</b> K.Hasbrouck	<b>Well/Boring ID:</b> SB-HM24  <b>Client:</b> RACER  <b>Location:</b> RACER Lansing Plant 3  <b>Weather Conditions:</b> Sunny, 70 F
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DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Water Level (ft. bgs.)	Well/Boring Construction
80	-80	17	80.0-85.0	4.6	0.0	X		NOTE: Color change to brown (slightly red) 7.5Y 4/3 at 77.0' bgs.		
85	-85	18	85.0-87.0	1.8	0.0	X		(84.0'-87.0') Weathered sandstone bedrock; SAND, fine to very fine; and weathered sandstone bedrock fragments to very large pebbles, subround to subangular; trace granules (foreign) to large pebbles, subround to subangular; gray (2.5Y 7/1).		
90	-90							End of boring at 87.0' bgs.		
95	-95									

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	<b>Remarks:</b> bgs = below ground surface No groundwater encountered. No odor or staining observed.
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**Appendix C**

Triad Environmental Services  
QA/QC Summary Tables

## DSITMS USEPA Method 8265 QA/QC Analytical Results for VOCs

Sample	Date	Units	PCE	TCE	DCE	VC/1,2-DCA	1,1-DCA	1,1,1-TCA	QC Criteria	Comments
Blnk 01	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 02	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/15/2014	ug/L	19.4	19.6	19.0	21.0	17.8	18.1	14-26	Pass
Blnk 03	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 02	7/15/2014	ug/L	16.9	16.4	16.2	18.7	17.7	17.6	14-26	Pass
20 ppb PEC	7/15/2014	ug/L	< 2.00	15.4	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HC24-71 MS	7/15/2014	ug/L	15.7	14.4	14.8	16.7	19.3	17.2	14-26	Pass
Blnk 04	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 03	7/15/2014	ug/L	16.2	16.1	14.9	15.6	17.8	16.9	14-26	Pass
20 ppb PEC 02	7/15/2014	ug/L	< 2.00	15.2	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HH24-13 MS	7/15/2014	ug/L	16.5	17.3	15.5	18.8	17.2	15.9	14-26	Pass
Blnk 05	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 04	7/15/2014	ug/L	15.7	16.9	15.2	15.3	17.4	15.9	14-26	Pass
20 ppb PEC 03	7/15/2014	ug/L	< 2.00	16.6	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HH24-53 MS	7/15/2014	ug/L	16.1	16.0	15.4	15.8	15.0	15.1	14-26	Pass
Blnk 06	7/15/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass

Blnk 01	7/16/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/16/2014	ug/L	16.6	16.1	15.8	18.5	19.8	17.3	14-26	Pass
20 ppb cal chk 03	7/16/2014	ug/L	16.2	16.4	18.6	15.9	17.6	15.1	14-26	Pass
20 ppb PEC 01	7/16/2014	ug/L	< 2.00	17.1	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HH24-94 MS	7/16/2014	ug/L	15.1	15.9	13.9	16.2	17.5	14.1	14-26	Pass
Blnk 02	7/16/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 03	7/16/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 04	7/16/2014	ug/L	18.9	19.5	19.2	21.8	18.8	19.6	14-26	Pass
Blnk 04	7/16/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 05	7/16/2014	ug/L	18.0	20.2	19.1	19.7	22.8	20.2	14-26	Pass
20 ppb PEC 02	7/16/2014	ug/L	< 2.00	19.6	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HC29-21 MS	7/16/2014	ug/L	19.1	19.6	19.9	23.4	17.9	19.6	14-26	Pass
Blnk 05	7/16/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
HC29-46 MS	7/16/2014	ug/L	18.0	19.6	19.4	21.3	24.4	21.0	14-26	Pass
20 ppb cal chk 06	7/16/2014	ug/L	18.3	19.3	18.9	19.1	21.9	20.9	14-26	Pass
20 ppb PEC 03	7/16/2014	ug/L	< 2.00	17.4	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass



## DSITMS USEPA Method 8265 QA/QC Analytical Results for VOCs

Sample	Date	Units	PCE	TCE	DCE	VC/1,2-DCA	1,1-DCA	1,1,1-TCA	QC Criteria	Comments
Blnk 01	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/18/2014	ug/L	21.9	22.8	23.5	23.1	24.1	24.2	14-26	Pass
20 ppb cal chk 02	7/18/2014	ug/L	19.7	22.3	21.4	23	26.1	22.6	14-26	Pass
20 ppb PEC 01	7/18/2014	ug/L	< 2.00	18.1	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX26-31 MS	7/18/2014	ug/L	20.1	22.5	22.7	24.6	23.4	23.7	14-26	Pass
Blnk 02	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 03	7/18/2014	ug/L	20.7	20.8	19.8	20.9	21	24.3	14-26	Pass
Blnk 03	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 04	7/18/2014	ug/L	22.9	23.1	22.2	24.3	24.1	24.7	14-26	Pass
20 ppb PEC 02	7/18/2014	ug/L	< 2.00	21.4	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX26-45 MS	7/18/2014	ug/L	23.5	24.2	23.7	22.8	22.2	25	14-26	Pass
Blnk 04	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 05	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20ppb cal chk 05	7/18/2014	ug/L	20.4	21.7	21.8	19.5	21.8	20.4	14-26	Pass
20 ppb PEC 04	7/18/2014	ug/L	< 2.00	21.7	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX19-76 MS	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 06	7/18/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass

Blnk 01	7/21/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/21/2014	ug/L	25.9	28.4	22	26.5	30	28.5	14-26	Fail
Blnk 02	7/21/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 02	7/21/2014	ug/L	18.6	19.4	19	20	23.1	20.3	14-26	Pass
20 ppb cal chk 03	7/21/2014	ug/L	19.3	20.2	20.2	20.2	22.5	21.2	14-26	Pass
20 ppb PEC 01	7/21/2014	ug/L	< 2.00	18.6	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX21-21 MS	7/21/2014	ug/L	21.2	22.4	23.6	25.1	21.1	19.9	14-26	Pass
Blnk 03	7/21/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 04	7/21/2014	ug/L	22.2	22.2	22.8	23.1	23.3	21.3	14-26	Pass
20 ppb PEC 02	7/21/2014	ug/L	< 2.00	19.4	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX21-62 MS	7/21/2014	ug/L	18.6	21.3	23.1	25.9	20.8	21.8	14-26	Pass
Blnk 04	7/21/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 05	7/21/2014	ug/L	21.4	22	22.3	23.8	23.9	22	14-26	Pass
20 ppb PEC 03	7/21/2014	ug/L	< 2.00	21.2	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GX21-87 MS	7/21/2014	ug/L	19.5	20.9	21.1	22.6	23.7	21.0	14-26	Pass
Blnk 05	7/21/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass

recalibrated

## DSITMS USEPA Method 8265 QA/QC Analytical Results for VOCs

Sample	Date	Units	PCE	TCE	DCE	VC/1,2-DCA	1,1-DCA	1,1,1-TCA	QC Criteria	Comments
Blnk 01	7/22/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/22/2014	ug/L	21.2	23	22.1	24.8	23	22.9	14-26	Pass
Blnk 02	7/22/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 02	7/22/2014	ug/L	23.7	23.8	24.8	24.9	25	24.4	14-26	Pass
20 ppb PEC 01	7/22/2014	ug/L	< 2.00	23	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HA21-37.5 MS	7/22/2014	ug/L	21.3	22.9	23.4	25.3	24.7	22.8	14-26	Pass
Blnk 03	7/22/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 03	7/22/2014	ug/L	24.2	24.7	24.4	23.7	24.5	25	14-26	Pass
20 ppb PEC 02	7/22/2014	ug/L	< 2.00	23.2	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HA26-45 MS	7/22/2014	ug/L	21.4	23.3	22.6	23.7	24.4	23.0	14-26	Pass
Blnk 04	7/22/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 01	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/23/2014	ug/L	21.9	22.8	23	25	24.6	23.3	14-26	Pass
20 ppb cal chk 02	7/23/2014	ug/L	21.4	22.1	21.8	22.9	24.7	22.3	14-26	Pass
20 ppb PEC 01	7/23/2014	ug/L	< 2.00	20.5	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
HA21-95 MS	7/23/2014	ug/L	18.9	20.4	19.9	21.7	24.5	20.4	14-26	Pass
Blnk 02	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 03	7/23/2014	ug/L	20	20.9	20.2	21.8	21.5	22.3	14-26	Pass
20 ppb PEC 02	7/23/2014	ug/L	< 2.00	19	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GT29-13 MS	7/23/2014	ug/L	18.3	20.4	19.8	21.8	25.6	20.9	14-26	Pass
Blnk 03	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 04	7/23/2014	ug/L	18.5	18.6	18.3	19.9	24.1	20.3	14-26	Pass
20 ppb PEC 03	7/23/2014	ug/L	< 2.00	17.3	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GT29-25 MS	7/23/2014	ug/L	16.8	18.3	18.0	19.2	23.6	19.7	14-26	Pass
Blnk 04	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
Blnk 05	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 05	7/23/2014	ug/L	16.9	17.6	16.2	18	22.1	19.3	14-26	Pass
20 ppb PEC 04	7/23/2014	ug/L	< 2.00	15.4	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
GT29-50 MS	7/23/2014	ug/L	15.2	17.6	16.7	19.7	23.9	18.9	14-26	Pass
Blnk 06	7/23/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
GT29-77 MS	7/23/2014	ug/L	17.9	18.5	17.9	19.6	22.5	19.4	14-26	Pass

## DSITMS USEPA Method 8265 QA/QC Analytical Results for VOCs

Sample	Date	Units	PCE	TCE	DCE	VC/1,2-DCA	1,1-DCA	1,1,1-TCA	QC Criteria	Comments
Blk 01	7/24/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 01	7/24/2014	ug/L	19.1	19	17.7	18.8	21.5	17.4	14-26	Pass
20 ppb PEC 01	7/24/2014	ug/L	< 2.00	18.8	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
Blk 02	7/24/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
20 ppb cal chk 02	7/24/2014	ug/L	18.4	18.4	19.3	19.7	18.7	19.1	14-26	Pass
20 ppb PEC 02	7/24/2014	ug/L	< 2.00	18.2	< 2.00	< 2.00	< 2.00	< 2.00	14-26	Pass
Blk 03	7/24/2014	ug/L	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	< 2.00	Pass
GT29_77 MS	7/24/2014	ug/L	17.9	18.7	17.7	18.9	22.1	18	14-26	Pass
GT19_55 MS	7/24/2014	ug/L	18.8	19.8	19.4	20.2	19.8	20.6	14-26	Pass
GT19_80 MS	7/24/2014	ug/L	17.4	18.1	17.5	18.4	20.1	18.8	14-26	Pass

## DSITMS USEPA Method 8265 QA/QC Analytical Results for 1,4-Dioxane

Sample	Date	Units	1,4 Dioxane	QC Criteria	Comments
Blnk 01	7/15/2014	ug/L	< 5.0	< 5.0	Pass
Blnk 02	7/15/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/15/2014	ug/L	17.9	14-26	Pass
20 ppb cal chk 02	7/15/2014	ug/L	15.3	14-26	Pass
Blnk 03	7/15/2014	ug/L	< 5.0	< 5.0	Pass
HC24 50 MS	7/15/2014	ug/L	16.7	14-26	Pass

Blnk 01	7/16/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/16/2014	ug/L	15.1	14-26	Pass
20 ppb cal chk 02	7/16/2014	ug/L	15.1	14-26	Pass
Blnk 02	7/16/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/16/2014	ug/L	23.9	14-26	Pass
Blnk 03	7/16/2014	ug/L	< 5.0	< 5.0	Pass
HH24 VAP 19.5-24.5 MS	7/16/2014	ug/L	21.6	14-26	Pass
HH24 62 MS	7/16/2014	ug/L	23.9	14-26	Pass

Blnk 01	7/17/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/17/2014	ug/L	24.9	14-26	Pass
Blnk 02	7/17/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/17/2014	ug/L	24.0	14-26	Pass
Blnk 03	7/17/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/17/2014	ug/L	15.7	14-26	Pass
HC29 12 MS	7/17/2014	ug/L	16.1	14-26	Pass
HC29 64 MS	7/17/2014	ug/L	19.9	14-26	Pass
GX29 31.5 MS	7/17/2014	ug/L	17.2	14-26	Pass

Blnk 01	7/18/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/18/2014	ug/L	14.4	14-26	Pass
Blnk 02	7/18/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/18/2014	ug/L	14.9	14-26	Pass
Blnk 03	7/18/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/18/2014	ug/L	15.0	14-26	Pass
GX29 80 MS	7/18/2014	ug/L	18.5	14-26	Pass
GX29 40 MS	7/18/2014	ug/L	16	14-26	Pass

Blnk 01	7/19/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/19/2014	ug/L	15.5	14-26	Pass
Blnk 02	7/19/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/19/2014	ug/L	18.9	14-26	Pass
GX26 92 MS	7/19/2014	ug/L	15.3	14-26	Pass
GX29 75 MS	7/19/2014	ug/L	25.7	14-26	Pass

## DSITMS USEPA Method 8265 QA/QC Analytical Results for 1,4-Dioxane

Sample	Date	Units	1,4 Dioxane	QC Criteria	Comments
Blnk 01	7/21/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/21/2014	ug/L	23.1	14-26	Pass
Blnk 02	7/21/2014	ug/L	< 5.0	< 5.0	Pass
Blnk 03	7/21/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/21/2014	ug/L	19.8	14-26	Pass
GX21 5 MS	7/21/2014	ug/L	16.5	14-26	Pass

Blnk 01	7/22/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/22/2014	ug/L	23.1	14-26	Pass
Blnk 02	7/22/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/22/2014	ug/L	21.5	14-26	Pass
Blnk 03	7/22/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/22/2014	ug/L	21.4	14-26	Pass
GX21 59 MS	7/22/2014	ug/L	23.7	14-26	Pass
HA24 38 MS	7/22/2014	ug/L	19.2	14-26	Pass
HA26 40 MS	7/22/2014	ug/L	21.5	14-26	Pass

Blnk 01	7/23/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/23/2014	ug/L	16.5	14-26	Pass
Blnk 02	7/23/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/23/2014	ug/L	18.5	14-26	Pass
Blnk 03	7/23/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/23/2014	ug/L	21.5	14-26	Pass
HA21 54 MS	7/23/2014	ug/L	21.1	14-26	Pass
GT24 10 MS	7/23/2014	ug/L	22	14-26	Pass

Blnk 01	7/24/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/24/2014	ug/L	25.3	14-26	Pass
Blnk 02	7/24/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/24/2014	ug/L	23.4	14-26	Pass
20 ppb cal chk 03	7/24/2014	ug/L	18.7	14-26	Pass
Blnk 03	7/24/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 04	7/24/2014	ug/L	23.8	14-26	Pass
Blnk 04	7/24/2014	ug/L	< 5.0	< 5.0	Pass
GT29 47 MS	7/24/2014	ug/L	24.4	14-26	Pass
GT29 29 MS	7/24/2014	ug/L	22.4	14-26	Pass
GT19 7 MS	7/24/2014	ug/L	23.1	14-26	Pass
Gx34 47 MS	7/24/2014	ug/L	23.7	14-26	Pass

**Appendix C**  
Triad Environmental Services QA/QC

DSITMS USEPA Method 8265 QA/QC Analytical Results for 1,4-Dioxane

Sample	Date	Units	1,4 Dioxane	QC Criteria	Comments
Blnk 01	7/25/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/25/2014	ug/L	18.3	14-26	Pass
Blnk 02	7/25/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/25/2014	ug/L	21.8	14-26	Pass
Blnk 03	7/25/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/25/2014	ug/L	22.7	14-26	Pass
Blnk 04	7/25/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 04	7/25/2014	ug/L	23.4	14-26	Pass
Gx34 47 MS	7/25/2014	ug/L	22.4	14-26	Pass
HM24 67 MS	7/25/2014	ug/L	22.7	14-26	Pass
HH19 82 67 MS	7/25/2014	ug/L	22.7	14-26	Pass

Blnk 01	7/26/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/26/2014	ug/L	17.9	14-26	Pass
Blnk 02	7/26/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/26/2014	ug/L	17.8	14-26	Pass
HH19 6 MS	7/26/2014	ug/L	17.5	14-26	Pass

Blnk 01	7/27/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/27/2014	ug/L	16.1	14-26	Pass
Blnk 02	7/27/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/27/2014	ug/L	19.2	14-26	Pass
HC19 24 MS	7/27/2014	ug/L	22.4	14-26	Pass

Blnk 01	7/28/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/28/2014	ug/L	20.6	14-26	Pass
Blnk 02	7/28/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/28/2014	ug/L	20	14-26	Pass
QC26/27 12 MS	7/28/2014	ug/L	22.2	14-26	Pass

Blnk 01	7/29/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/29/2014	ug/L	19.6	14-26	Pass
Blnk 02	7/29/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/29/2014	ug/L	18.1	14-26	Pass
Blnk 03	7/29/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/29/2014	ug/L	18.6	14-26	Pass
GQ26/27 75 MS	7/29/2014	ug/L	21.6	14-26	Pass
GQ34 73 MS	7/29/2014	ug/L	22	14-26	Pass

## DSITMS USEPA Method 8265 QA/QC Analytical Results for 1,4-Dioxane

Sample	Date	Units	1,4 Dioxane	QC Criteria	Comments
Blnk 01	7/30/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/30/2014	ug/L	19.6	14-26	Pass
Blnk 02	7/30/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/30/2014	ug/L	15.7	14-26	Pass
Blnk 03	7/30/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/30/2014	ug/L	18.5	14-26	Pass
Blnk 04	7/30/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 04	7/30/2014	ug/L	16.9	14-26	Pass
HM14 18MS	7/30/2014	ug/L	17.6	14-26	Pass
GQ34 73 MS	7/30/2014	ug/L	17	14-26	Pass
HH39 60 MS	7/30/2014	ug/L	16.5	14-26	Pass

Blnk 01	7/31/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 01	7/31/2014	ug/L	17.3	14-26	Pass
Blnk 02	7/31/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 02	7/31/2014	ug/L	17	14-26	Pass
Blnk 03	7/31/2014	ug/L	< 5.0	< 5.0	Pass
20 ppb cal chk 03	7/31/2014	ug/L	17.6	14-26	Pass
GX24b 74 MS	7/31/2014	ug/L	17.3	14-26	Pass



## **Appendix D**

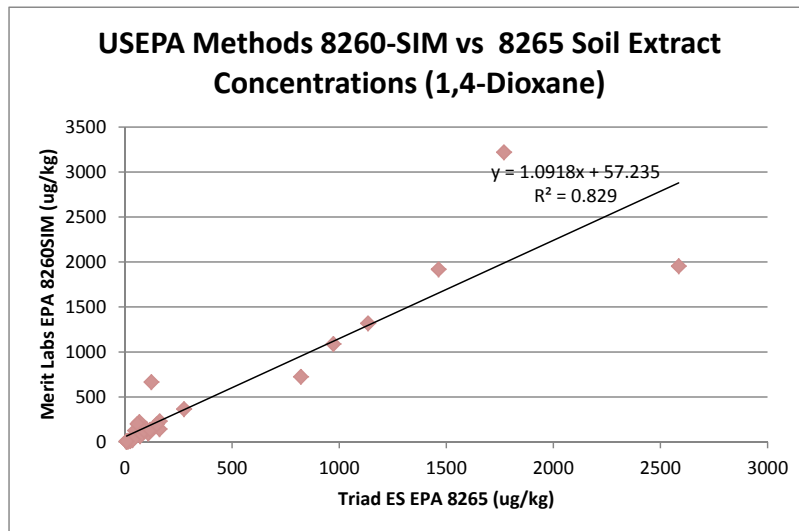
Off-Site Laboratory Summary  
Tables and Comparison Graphs

**Appendix D**  
**Comparison of USEPA Methods 8260-SIM and 8265 1,4-Dioxane Soil Extract Concentrations**

**PreDesign Study Report**  
**RACER Trust**  
**Lansing, MI - Plant 2**

Sample_name	Depth_begin	Depth_End	Sample_type	Date_sampled	Units	Triad ES 8265 Extract 1,4-Dioxane	Merit Heated Headspace 8260SIM Extract 1,4-Dioxane
GX19-70	70	70	Soil	7/27/2014	µg/kg	37	41
GX21_18	18	18	Soil	7/27/2014	µg/kg	67	223
GX24_15	15	15	Soil	7/27/2014	µg/kg	1769	3221
GX24_21	21	21	Soil	7/27/2014	µg/kg	1464	1920
GX24_24	24	24	Soil	7/27/2014	µg/kg	1135	1319
GX24_26.5	26.5	26.5	Soil	7/27/2014	µg/kg	821	725
GX24_75	75	75	Soil	7/27/2014	µg/kg	161	143
GX29_24.5	24.5	24.5	Soil	7/27/2014	µg/kg	92	138
HA24_70	70	70	Soil	7/27/2014	µg/kg	33	21
HA24_73	73	73	Soil	7/27/2014	µg/kg	47	125
HA24_76	76	76	Soil	7/27/2014	µg/kg	109	95
HC19_62	62	62	Soil	7/27/2014	µg/kg	123	666
HC19_65	65	65	Soil	7/27/2014	µg/kg	58	200
HC24_59	59	59	Soil	7/27/2014	µg/kg	71	66
HC24_62	62	62	Soil	7/27/2014	µg/kg	24	13
HC24_74	74	74	Soil	7/27/2014	µg/kg	99	148
HC24_92	92	92	Soil	7/27/2014	µg/kg	15	7.5
HC29_79	79	79	Soil	7/27/2014	µg/kg	89	126
HH24-30	30	30	Soil	7/27/2014	µg/kg	13	15
GX24b_6	6	6	Soil	7/31/2014	µg/kg	162	232
GX24b_9	9	9	Soil	7/31/2014	µg/kg	7.5	7.5
GX24b_13	13	13	Soil	7/31/2014	µg/kg	118	137
GX24b_16	16	16	Soil	7/31/2014	µg/kg	2585	1955
GX24b_19	19	19	Soil	7/31/2014	µg/kg	973	1090
GX24b_23	23	23	Soil	7/31/2014	µg/kg	275	366
GX24b_26	26	26	Soil	7/31/2014	µg/kg	148	196
GX24b_29	29	29	Soil	7/31/2014	µg/kg	7.5	7.5
GX24b_69	69	69	Soil	7/31/2014	µg/kg	7.5	7.5
GX24b_73	73	73	Soil	7/31/2014	µg/kg	37	27
GX24b_76	76	76	Soil	7/31/2014	µg/kg	7.5	7.5

*Italicized values indicate results were below detection limits and half the detection limit was entered*



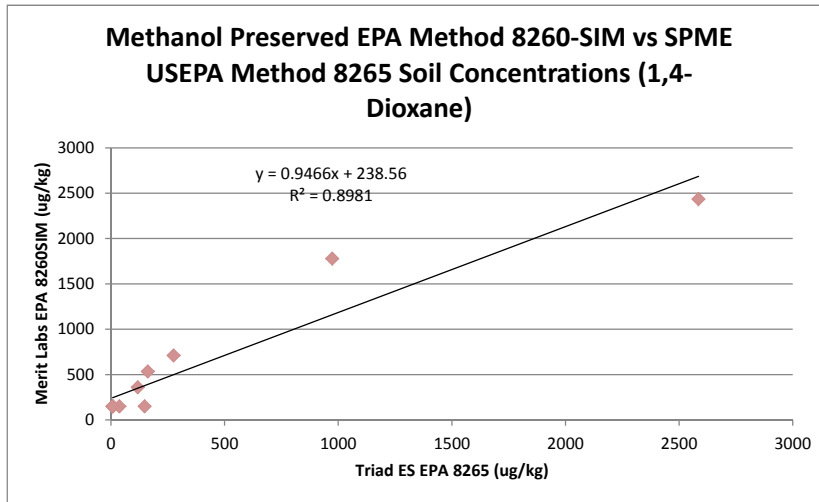
Appendix D

Comparison of Methanol Preserved USEPA Method 8260-SIM and SPME USEPA Method 8265 1,4-Dioxane Soil Concentrations

PreDesign Study Report  
RACER Trust  
Lansing, MI - Plant 2

Sample_name	Depth_begin	Depth_end	Sample_type	Date_sampled	Triad ES 8265 Extract 1,4-Dioxane (Wet Weight)	Merit Total Solids	Merit MeOH 8260SIM 1,4-Dioxane (Dry Weight)	Merit MeOH 8260SIM 1,4-Dioxane (Wet Weight)
					ug/kg	%	ug/kg	ug/kg
GX24b_6	6	6	Soil	7/31/2014	162	89	600	534
GX24b_9	9	9	Soil	7/31/2014	7.5	87	150	150
GX24b_13	13	13	Soil	7/31/2014	118	90	400	360
GX24b_16	16	16	Soil	7/31/2014	2585	87	2800	2436
GX24b_19	19	19	Soil	7/31/2014	973	89	2000	1780
GX24b_23	23	23	Soil	7/31/2014	275	79	900	711
GX24b_26	26	26	Soil	7/31/2014	148	85	150	150
GX24b_29	29	29	Soil	7/31/2014	7.5	97	150	150
GX24b_69	69	69	Soil	7/31/2014	7.5	83	150	150
GX24b_73	73	73	Soil	7/31/2014	37	84	150	150
GX24b_76	76	76	Soil	7/31/2014	7.5	87	150	150

*Italicized values indicate results were below detection limits and half the detection limit was entered*

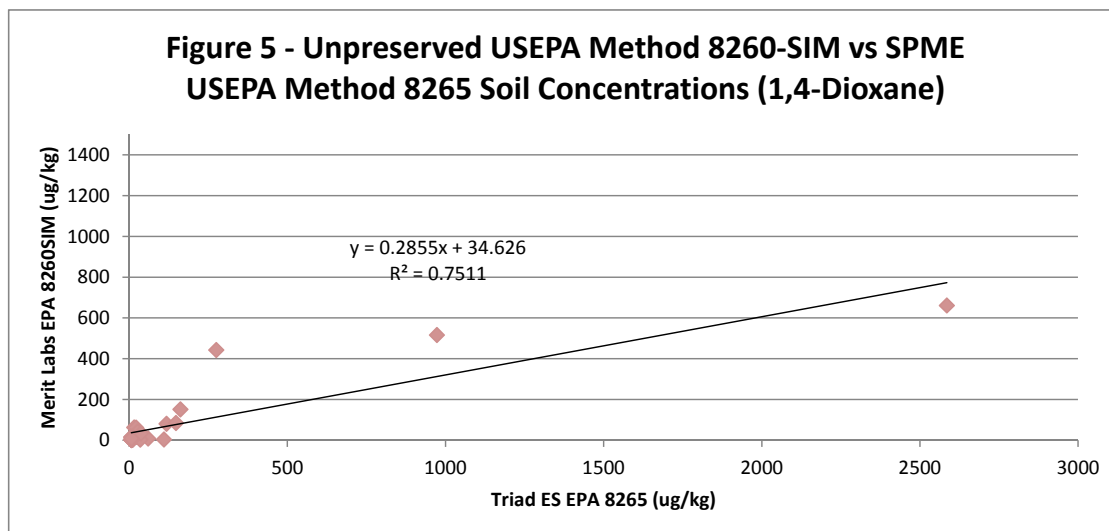


**Appendix D**  
**Comparison of Unpreserved USEPA Methods 8260-SIM and 8265 1,4-Dioxane Soil Extract Concentrations**

**PreDesign Study Report**  
**RACER Trust**  
**Lansing, MI - Plant 2**

Sample Name	Depth	Date	Triad ES 8265 Extract 1,4- Dioxane (Wet Weight)	Merit Heated Headspace 8260 SIM 1,4-Dioxane (Dry Weight)	Total Solids	Merit Heated Headspace 8260 SIM 1,4-Dioxane (Wet Weight)
	(ft)	analyzed	(ug/kg)	(ug/kg)	(%)	(ug/kg)
GX19-70	70	07/27/14	6.8	20	79	16
GX21_15	15	07/21/14	23	19	91	17
GX24_75	75	07/27/14	16	73	86	63
GX26_19	19	07/19/14	<i>7.5</i>	<i>1.5</i>	91	<i>1.5</i>
HA24_70	70	07/27/14	110	5.0	82	4.1
HC19_65	65	07/27/14	22	74	84	62
HC24_17	17	07/14/14	9.6	9.0	74	6.66
HC24_59	59	07/27/14	41	30	90	27
HC24_62	62	07/27/14	60	11	83	9.1
HC24_74	74	07/27/14	27	50	85	43
HC24_92	92	07/27/14	12	4.0	86	3.4
HC29_3	3	07/16/14	9.0	<i>1.5</i>	82	<i>1.5</i>
HH24_24	24	07/15/14	6.8	<i>1.5</i>	89	<i>1.5</i>
HH24-30	30	07/27/14	35	4.0	91	3.6
HH24_68	68	07/15/14	11	18	87	16
HH24_93	93	07/15/14	7.7	15	83	12
GX24b_6	6	07/31/14	162	170	89	151
GX24b_9	9	07/31/14	<i>7.5</i>	<i>1.5</i>	87	<i>1.5</i>
GX24b_13	13	07/31/14	118	90	90	81
GX24b_16	16	07/31/14	2585	760	87	661
GX24b_19	19	07/31/14	973	580	89	516
GX24b_23	23	07/31/14	275	560	79	442
GX24b_26	26	07/31/14	148	100	85	85
GX24b_29	29	07/31/14	<i>7.5</i>	<i>1.5</i>	97	<i>1.5</i>
GX24b_69	69	07/31/14	<i>7.5</i>	20	83	17
GX24b_73	73	07/31/14	37	40	84	34
GX24b_76	76	07/31/14	<i>7.5</i>	10	87	8.7

*Italicized values indicate results were below detection limits and half the detection limit was entered*



**Appendix D  
Comparison USEPA Methods 8260 and 8265 VOCs Soil Concentrations**

**PreDesign Study Report  
RACER Trust  
Lansing, MI - Plant 2**

Sample_name	Depth_begin	Depth_end	Sample_type	Date_sampled	Units	Triad ES EPA 8265 (Wet Weight)						Merit Laboratories EPA 8260 (Dry Weight)						Total Solids			
						PCE	TCE	DCE	VC+1,2 DCA	1,1-DCA	1,1,1-TCA	PCE	TCE	trans-1,2-DCE	cis-1,2-DCE	VC	1,2 DCA		1,1-DCA	1,1,1-TCA	
GX19-70	70	70	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	79	
GX21-13	13	13	Soil	7/21/2014	mg/kg	<0.006	<0.006	0.018	<0.006	0.011	<0.006	0.14	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	88
GX21-15	15	15	Soil	7/21/2014	mg/kg	<0.006	<0.006	0.167	<0.006	0.084	0.007	<0.060	<0.060	0.26	4.58	<0.060	<0.060	1.25	<0.060	<0.060	91
GX24-75	75	75	Soil	7/17/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	86
GX26-19	19	19	Soil	7/18/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	0.093	<0.006	<0.060	<0.060	<0.060	0.17	<0.060	<0.060	2.42	<0.060	<0.060	91
HC19-65	65	65	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	84
HC24_17	17	17	Soil	7/14/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	<0.090	74
HC24_74	74	74	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	85
HC24-59	59	59	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	90
HC24-62	62	62	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	83
HC24-92	92	92	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	86
HC29-3	3	3	Soil	7/16/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	82
HH24_68	68	68	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	87
HH24_93	93	93	Soil	7/15/2014	mg/kg	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	<0.070	83
HH24-24	24	24	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	89
HH24-30	30	30	Soil	7/15/2014	mg/kg	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	<0.060	91

PCE - Tetrachloroethene  
TCE - Trichloroethene  
DCE - Dichloroethene  
VC - Vinyl chloride  
DCA - Dichloroethane  
TCA - Trichloroethane

**Appendix D  
Summary of SPLP Analytical Results**

**PreDesign Study Report  
RACER Trust  
Lansing, MI - Plant 2**

<b>Sample Name</b>	<b>Depth</b>	<b>Date</b>	<b>Merit Laboratories 1,4-Dioxane by USEPA 8260SIM</b>	<b>Merit Laboratories 1,4-Dioxane by USEPA 8260SIM</b>	<b>Calculated Field Leachate</b>
	(ft)	analyzed	(ug/kg)	(ug/L)	(ug/L)
GX24b_16	16	07/31/14	2800	36	48
GX24b_19	19	07/31/14	2000	18	22
GX24b_73	73	07/31/14	40	<5	<5
HC24_17	17	07/14/14	9	<5	<5
HC24_59	59	07/27/14	30	<5	<5
HC24_62	62	07/27/14	11	<5	<5
HC24_74	74	07/27/14	50	<5	<5
HC24_92	92	07/27/14	4	<5	<5
HH24_24	24	07/15/14	<2	<5	<5
HH24_68	68	07/15/14	18	<5	<5
HH24_93	93	07/15/14	15	<5	<5
HH24-30	30	07/27/14	4	<5	<5

**Appendix D  
Summary of FOC Analytical Results**

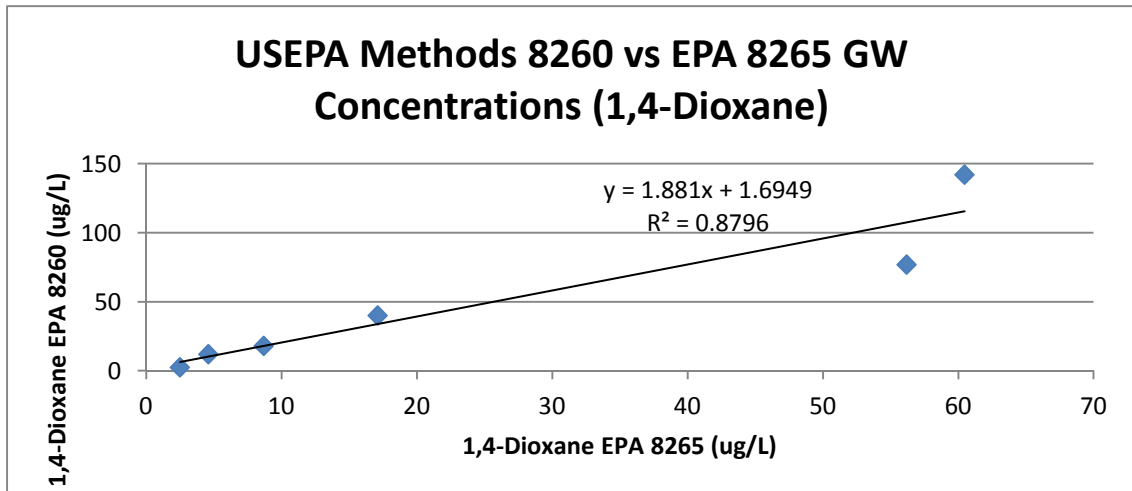
**PreDesign Study Report  
RACER Trust  
Lansing, MI - Plant 2**

<b>Sample Name</b>	<b>Total Solids</b>	<b>FOC</b>	<b>FOC Average</b>	<b>Soil Type</b>
	(%)	(%)	(%)	USCS
HC24_17	74	0.52	0.35	CL
HH24_24	89	0.39		CL
HH24-30	91	0.15		CL
HC24_59	90	0.44	0.90	CL
HC24_62	83	1.46		ML/SP
HH24_68	87	0.39		ML/SP
HC24_74	85	1.31		ML
HH24_93	83	0.09	0.24	Sandstone
HC24_92	86	0.38		SP

**Appendix D**  
**Comparison of USEPA Methods 8260-SIM and 8265 1,4-Dioxane Groundwater Concentrations**

**PreDesign Study Report**  
**RACER Trust**  
**Lansing, MI - Plant 2**

Sample ID	Units	Triad ES EPA 8265 1,4-Dioxane	Merit Labs EPA 8260-SIM 1,4-Dioxane
GX19 (85-90)	ug/L	8.70	18
GX24 (90-95)	ug/L	4.60	12
HC24 (90-95)	ug/L	17.10	40
HC29 (85-90)	ug/L	56.20	77
HH24 (90-95)	ug/L	60.47	142
HM14 (90-95)	ug/L	2.5	2.5



Appendix D  
 Comparison of USEPA Methods 8260 and 8265 VOCs Groundwater Concentrations

PreDesign Study Report  
 RACER Trust  
 Lansing, MI - Plant 2

Sample_name	Depth_Begin	Depth_end	Date_sampled	Units	Triad ES EPA 8265						Merit Laboratories EPA 8260						
					PCE	TCE	DCE	VC+1,2 DCA	1,1-DCA	1,1,1-TCA	PCE	TCE	cis-1,2-DCE	trans-1,2-DCE	VC	1,1-DCA	1,1,1-TCA
VAP-GX19-(85-90)	85	90	7/18/2014	ug/L	<2.0	<2.0	<2.0	<2.0	2.7	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
VAP-GX24-(90-95)	90	95	7/17/2014	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
VAP-HC24-(90-95)	90	95	7/16/2014	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
VAP-HC29-(85-90)	85	90	7/17/2014	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
VAP-HH24-(90-95)	90	95	7/15/2014	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

PCE - Tetrachloroethene  
 TCE - Trichloroethene  
 DCE - Dichloroethene  
 VC - Vinyl chloride  
 DCA - Dichloroethane  
 TCA - Trichloroethane

**Appendix D**  
**Summary of Geotechnical Laboratory Testing Results**

**PreDesign Study Report**  
**RACER Trust**  
**Lansing, MI - Plant 2**

Sample Name	USCS Classification	Moisture Content	Dry Density	Porosity	Hydraulic Conductivity
		%	lb/ft <sup>3</sup>	%	cm/sec
SB-GX24b (10-12 ft)	CL	9.8	131.5	25	2.01 x 10 <sup>-6</sup>
SB-GX24b (20-22 ft)	CL	11.1	132.9	23	3.60 x 10 <sup>-8</sup>
SB-GX24b (70-72 ft)	CL	17.6	116.5	33	4.08 x 10 <sup>-5</sup>
SB-GX24b (90-92 ft)	ML	13.8	104.4	39	5.16 x 10 <sup>-5</sup>

CL - Inorganic clays of low to medium plasticity including gravelly clays, sandy clays, silty clays, and lean clays

ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sand or clayey silts with slight plasticity



## **Appendix E**

Merit Laboratories Analytical  
Reports



# Analytical Laboratory Report

Report ID: S61911.01(03)

Generated on 07/23/2014

Replaces report S61911.01(02) generated on 07/23/2014

Report to

Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837  
Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright, Jeff Davin

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
Kevin George (kgeorge@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S61911.01-S61911.12  
Project: B0064480.0014.00102 RACER Lansing / Lansing, MI  
Collected Date: 07/14/2014 - 07/17/2014  
Submitted Date/Time: 07/17/2014 14:20  
Sampled by: Austin Westhuis  
P.O. #: B0064480.0014.00102

Report Notes

Results relate only to items tested as received by the laboratory.  
Methods may be modified for improved performance.  
Results reported on a dry weight basis where applicable.  
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).  
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.  
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)  
IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)  
Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



## Analytical Laboratory Report

### Sample Summary (12 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S61911.01	SB-HC24_17	Soil	07/14/2014 16:30
S61911.02	SB-HC24_59	Soil	07/15/2014 11:00
S61911.03	SB-HC24_62	Soil	07/15/2014 11:20
S61911.04	SB-HC24_74	Soil	07/15/2014 13:35
S61911.05	SB-HC24_92	Soil	07/15/2014 15:05
S61911.06	VAP-HC24_90-95	Water	07/14/2014 17:10
S61911.07	SB-HH24_24	Soil	07/15/2014 09:15
S61911.08	SB-HH24_30	Soil	07/15/2014 10:25
S61911.09	SB-HH24_68	Soil	07/15/2014 15:45
S61911.10	SB-HH24_93	Soil	07/15/2014 17:20
S61911.11	VAP-HH24_90-95	Water	07/16/2014 08:30
S61911.12	Trip Blank-1	MeOH	07/17/2014 00:01



# Analytical Laboratory Report

Lab Sample ID: S61911.01  
 Sample Tag: SB-HC24\_17  
 Collected Date/Time: 07/14/2014 16:30  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.52	%	0.05	Walkley Black	07/21/14 14:20	JKB		
Total Solids	74	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 14:41	JGH	123-91-1	
1,4-Dioxane	9	ug/kg	3	SW8260B - SIM	07/23/14 05:19	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 21:02	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 21:02	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	76-13-1	
Acetone	1,050	ug/kg	860	5035/8260B	07/18/14 18:55	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	860	5035/8260B	07/18/14 18:55	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	860	5035/8260B	07/18/14 18:55	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.01 (continued)

Sample Tag: SB-HC24\_17

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	860	5035/8260B	07/18/14 18:55	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	860	5035/8260B	07/18/14 18:55	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	56-23-5	
Benzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	10061-01-5	
Toluene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	200	5035/8260B	07/18/14 18:55	JGH		
o-Xylene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	95-47-6	
Styrene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	98-82-8	
Bromoform	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	90	5035/8260B	07/18/14 18:55	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.02  
 Sample Tag: SB-HC24\_59  
 Collected Date/Time: 07/15/2014 11:00  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.44	%	0.05	Walkley Black	07/21/14 14:40	JKB		
Total Solids	90	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 14:59	JGH	123-91-1	
1,4-Dioxane	30	ug/kg	3	SW8260B - SIM	07/23/14 05:39	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 18:28	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 18:28	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	76-13-1	
Acetone	Not detected	ug/kg	630	5035/8260B	07/18/14 19:15	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	630	5035/8260B	07/18/14 19:15	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	630	5035/8260B	07/18/14 19:15	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.02 (continued)

Sample Tag: SB-HC24\_59

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	630	5035/8260B	07/18/14 19:15	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	630	5035/8260B	07/18/14 19:15	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	56-23-5	
Benzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	10061-01-5	
Toluene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 19:15	JGH		
o-Xylene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	95-47-6	
Styrene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	98-82-8	
Bromoform	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 19:15	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.03  
 Sample Tag: SB-HC24\_62  
 Collected Date/Time: 07/15/2014 11:20  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	1.46	%	0.05	Walkley Black	07/21/14 14:50	JKB		
Total Solids	83	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 15:18	JGH	123-91-1	
1,4-Dioxane	11	ug/kg	4	SW8260B - SIM	07/23/14 05:59	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 18:50	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 18:50	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	76-13-1	
Acetone	Not detected	ug/kg	710	5035/8260B	07/18/14 19:34	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	710	5035/8260B	07/18/14 19:34	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	710	5035/8260B	07/18/14 19:34	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.03 (continued)

Sample Tag: SB-HC24\_62

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	710	5035/8260B	07/18/14 19:34	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	710	5035/8260B	07/18/14 19:34	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 19:34	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:34	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.04  
 Sample Tag: SB-HC24\_74  
 Collected Date/Time: 07/15/2014 13:35  
 Matrix: Soil  
 COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	1.31	%	0.05	Walkley Black	07/21/14 15:00	JKB		
Total Solids	85	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 15:36	JGH	123-91-1	
1,4-Dioxane	50	ug/kg	3	SW8260B - SIM	07/23/14 06:18	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 19:12	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 19:12	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	76-13-1	
Acetone	Not detected	ug/kg	650	5035/8260B	07/18/14 19:54	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	650	5035/8260B	07/18/14 19:54	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	650	5035/8260B	07/18/14 19:54	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.04 (continued)

Sample Tag: SB-HC24\_74

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	650	5035/8260B	07/18/14 19:54	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	650	5035/8260B	07/18/14 19:54	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 19:54	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 19:54	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.05  
 Sample Tag: SB-HC24\_92  
 Collected Date/Time: 07/15/2014 15:05  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.38	%	0.05	Walkley Black	07/21/14 15:10	JKB		
Total Solids	86	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 15:54	JGH	123-91-1	
1,4-Dioxane	4	ug/kg	3	SW8260B - SIM	07/23/14 06:38	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 19:34	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 19:34	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	76-13-1	
Acetone	Not detected	ug/kg	670	5035/8260B	07/18/14 20:15	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	670	5035/8260B	07/18/14 20:15	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	670	5035/8260B	07/18/14 20:15	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.05 (continued)

Sample Tag: SB-HC24\_92

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	670	5035/8260B	07/18/14 20:15	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	670	5035/8260B	07/18/14 20:15	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 20:15	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 20:15	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.06  
 Sample Tag: VAP-HC24\_90-95  
 Collected Date/Time: 07/14/2014 17:10  
 Matrix: Water  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

pH check for VOCs	>2	STD Units		N/A	07/19/14 18:01	LBR		
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### Organics - Volatiles

1,4-Dioxane	40	ug/L	5	SW8260B - SIM	07/18/14 16:12	JGH	123-91-1	
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### TCL Volatile Organics 8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	76-13-1	
Acetone	Not detected	ug/L	10	SW8260B	07/18/14 17:22	JGH	67-64-1	
Carbon disulfide	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-15-0	
Methyl Acetate	Not detected	ug/L	10	SW8260B	07/18/14 17:22	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260B	07/18/14 17:22	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-71-8	
Chloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	74-87-3	
Vinyl chloride	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-01-4	
Bromomethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	74-83-9	
Chloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-35-4	
Methylene chloride	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	156-59-2	
Chloroform	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	71-55-6	
Cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	10	SW8260B	07/18/14 17:22	JGH	108-10-1	
2-Hexanone	Not detected	ug/L	10	SW8260B	07/18/14 17:22	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	56-23-5	
Benzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	107-06-2	
Trichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	10061-01-5	
Toluene	18	ug/L	1	SW8260B	07/18/14 17:22	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	124-48-1	
Chlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61911.06 (continued)

Sample Tag: VAP-HC24\_90-95

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics 8260 (continued)</b>								
Ethylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260B	07/18/14 17:22	JGH		
o-Xylene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	95-47-6	
Styrene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	98-82-8	
Bromoform	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	95-50-1	
1,2,4-Trichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	120-82-1	
1,2-Dibromoethane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	106-93-4	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	1	SW8260B	07/18/14 17:22	JGH	96-12-8	



# Analytical Laboratory Report

Lab Sample ID: S61911.07  
 Sample Tag: SB-HH24\_24  
 Collected Date/Time: 07/15/2014 09:15  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.39	%	0.05	Walkley Black	07/21/14 15:20	JKB		
Total Solids	89	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 16:30	JGH	123-91-1	
1,4-Dioxane	Not detected	ug/kg	2	SW8260B - SIM	07/23/14 06:58	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 21:24	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 21:24	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	76-13-1	
Acetone	Not detected	ug/kg	620	5035/8260B	07/18/14 20:35	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	620	5035/8260B	07/18/14 20:35	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	620	5035/8260B	07/18/14 20:35	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.07 (continued)

Sample Tag: SB-HH24\_24

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	620	5035/8260B	07/18/14 20:35	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	620	5035/8260B	07/18/14 20:35	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	56-23-5	
Benzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	10061-01-5	
Toluene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 20:35	JGH		
o-Xylene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	95-47-6	
Styrene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	98-82-8	
Bromoform	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:35	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.08  
 Sample Tag: SB-HH24\_30  
 Collected Date/Time: 07/15/2014 10:25  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.15	%	0.05	Walkley Black	07/21/14 15:30	JKB		
Total Solids	91	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 16:48	JGH	123-91-1	
1,4-Dioxane	4	ug/kg	3	SW8260B - SIM	07/23/14 07:17	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 19:56	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 19:56	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	76-13-1	
Acetone	Not detected	ug/kg	610	5035/8260B	07/18/14 20:55	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	610	5035/8260B	07/18/14 20:55	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	610	5035/8260B	07/18/14 20:55	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.08 (continued)

Sample Tag: SB-HH24\_30

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	610	5035/8260B	07/18/14 20:55	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	610	5035/8260B	07/18/14 20:55	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	56-23-5	
Benzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	10061-01-5	
Toluene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 20:55	JGH		
o-Xylene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	95-47-6	
Styrene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	98-82-8	
Bromoform	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 20:55	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.09  
 Sample Tag: SB-HH24\_68  
 Collected Date/Time: 07/15/2014 15:45  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.39	%	0.05	Walkley Black	07/21/14 15:40	JKB		
Total Solids	87	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 17:06	JGH	123-91-1	
1,4-Dioxane	18	ug/kg	3	SW8260B - SIM	07/23/14 07:37	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 20:40	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 20:40	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	76-13-1	
Acetone	Not detected	ug/kg	650	5035/8260B	07/18/14 21:16	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	650	5035/8260B	07/18/14 21:16	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	650	5035/8260B	07/18/14 21:16	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.09 (continued)

Sample Tag: SB-HH24\_68

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	650	5035/8260B	07/18/14 21:16	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	650	5035/8260B	07/18/14 21:16	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	56-23-5	
Benzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	10061-01-5	
Toluene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 21:16	JGH		
o-Xylene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	95-47-6	
Styrene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	98-82-8	
Bromoform	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/18/14 21:16	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.10  
 Sample Tag: SB-HH24\_93  
 Collected Date/Time: 07/15/2014 17:20  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR
1	4oz Glass	None	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

Acid Rain Zero Headspace Extract	Completed			SW1312	07/17/14 18:30	WAR		
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### Inorganics

Fractional Organic Carbon	0.09	%	0.05	Walkley Black	07/21/14 15:50	JKB		
Total Solids	83	%	1	Std M 2540 B	07/18/14 17:41	WAR		

### Organics - Volatiles

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/18/14 17:25	JGH	123-91-1	
1,4-Dioxane	15	ug/kg	3	SW8260B - SIM	07/23/14 07:57	JGH	123-91-1	1

### SPLP Volatiles

Benzene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	71-43-2	
Carbon tetrachloride	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	56-23-5	
Chlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	108-90-7	
Chloroform	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	67-66-3	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	106-46-7	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	107-06-2	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	75-35-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260C	07/18/14 20:18	JGH	78-93-3	
Tetrachloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	127-18-4	
Trichloroethene	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	79-01-6	
Vinyl chloride	Not detected	ug/L	1	SW8260C	07/18/14 20:18	JGH	75-01-4	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	76-13-1	
Acetone	Not detected	ug/kg	680	5035/8260B	07/18/14 21:36	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	680	5035/8260B	07/18/14 21:36	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	680	5035/8260B	07/18/14 21:36	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	156-59-2	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61911.10 (continued)

Sample Tag: SB-HH24\_93

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Chloroform	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	680	5035/8260B	07/18/14 21:36	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	680	5035/8260B	07/18/14 21:36	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 21:36	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/18/14 21:36	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61911.11  
Sample Tag: VAP-HH24\_90-95  
Collected Date/Time: 07/16/2014 08:30  
Matrix: Water  
COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

pH check for VOCs	<2	STD Units		N/A	07/19/14 18:01	LBR		
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### Organics - Volatiles

1,4-Dioxane	142	ug/L	5	SW8260B - SIM	07/18/14 17:43	JGH	123-91-1	
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### TCL Volatile Organics 8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	76-13-1	
Acetone	Not detected	ug/L	10	SW8260B	07/18/14 15:55	JGH	67-64-1	
Carbon disulfide	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-15-0	
Methyl Acetate	Not detected	ug/L	10	SW8260B	07/18/14 15:55	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260B	07/18/14 15:55	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-71-8	
Chloromethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	74-87-3	
Vinyl chloride	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-01-4	
Bromomethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	74-83-9	
Chloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-35-4	
Methylene chloride	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	156-59-2	
Chloroform	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	71-55-6	
Cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	10	SW8260B	07/18/14 15:55	JGH	108-10-1	
2-Hexanone	Not detected	ug/L	10	SW8260B	07/18/14 15:55	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	56-23-5	
Benzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	107-06-2	
Trichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	10061-01-5	
Toluene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	124-48-1	
Chlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61911.11 (continued)

Sample Tag: VAP-HH24\_90-95

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics 8260 (continued)</b>								
Ethylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260B	07/18/14 15:55	JGH		
o-Xylene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	95-47-6	
Styrene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	98-82-8	
Bromoform	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	95-50-1	
1,2,4-Trichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	120-82-1	
1,2-Dibromoethane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	106-93-4	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	1	SW8260B	07/18/14 15:55	JGH	96-12-8	



# Analytical Laboratory Report

Lab Sample ID: S61911.12  
 Sample Tag: Trip Blank-1  
 Collected Date/Time: 07/17/2014 00:01  
 Matrix: MeOH  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Organics - Volatiles

#### TCL Volatile Organics HighLevl 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	76-13-1	
Acetone	Not detected	ug/kg	500	5035/8260B	07/18/14 21:56	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	500	5035/8260B	07/18/14 21:56	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	500	5035/8260B	07/18/14 21:56	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	156-59-2	
Chloroform	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	500	5035/8260B	07/18/14 21:56	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	500	5035/8260B	07/18/14 21:56	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	56-23-5	
Benzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	10061-01-5	
Toluene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/18/14 21:56	JGH		
o-Xylene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	95-47-6	
Styrene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	100-42-5	



# Analytical Laboratory Report

Lab Sample ID: S61911.12 (continued)

Sample Tag: Trip Blank-1

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Isopropylbenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	98-82-8	
Bromoform	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/18/14 21:56	JGH	120-82-1	

ID#: \_\_\_\_\_

# CHAIN OF CUSTODY & LABORATORY ANALYSIS REQUEST FORM

Page 1 of 1

Lab Work Order # \_\_\_\_\_

Send Results to: **Randy Christensen**  
 Telephone: **810-225-1940**  
 Address: **10559 Citation Dr. Ste. 100**  
 Fax: **810-229-8837**  
 City: **Brighton, MI 48116** State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 E-mail Address: **randy.christensen@arcadis-us.com**

Preservative	F	E	E				
Filtered (✓)							
# of Containers	1	1	1				
Container Information	1	7	7				

**Keys**

**Preservation Key:**  
 A. H<sub>2</sub>SO<sub>4</sub>  
 B. HCL  
 C. HNO<sub>3</sub>  
 D. NaOH  
 E. None  
 F. Other: **MeOH**  
 G. Other: \_\_\_\_\_  
 H. Other: \_\_\_\_\_

**Container Information Key:**  
 1. 40 ml Vial  
 2. 1 L Amber  
 3. 250 ml Plastic  
 4. 500 ml Plastic  
 5. Encore  
 6. 2 oz. Glass  
 7. 4 oz. Glass  
 8. 8 oz. Glass  
 9. Other: \_\_\_\_\_  
 10. Other: \_\_\_\_\_

**Matrix Key:**  
 SO - Soil SE - Sediment NL - NAPL/Oil  
 W - Water SL - Sludge SW - Sample Wipe  
 T - Tissue A - Air Other: \_\_\_\_\_

Project Name/Location (City, State): **RACER Lansing/Lansing, MI** Project #: **80064480.0014.00102**  
 Sampler's Printed Name: **Austin Westhuis** Sampler's Signature: \_\_\_\_\_

**PARAMETER ANALYSIS & METHOD**

Sample ID	Collection		Type (✓)		Matrix
	Date	Time	Comp	Grab	
.01 SB-HC24-17	7/14/14	1630	✓	✓	SO
.02 SB-HC24-59	7/15/14	1100	✓	✓	SO
.03 SB-HC24-62	7/15/14	1120	✓	✓	SO
.04 SB-HC24-74	7/15/14	1335	✓	✓	SO
.05 SB-HC24-92	7/15/14	1505	✓	✓	SO
.06 VAP-HC24-90-95	7/14/14	1710	✓	✓	W
.07 SB-HH24-24	7/15/14	0915	✓	✓	SO
.08 SB-HH24-30	7/15/14	1025	✓	✓	SO
.09 SB-HH24-68	7/15/14	1545	✓	✓	SO
.10 SB-HH24-93	7/15/14	1720	✓	✓	SO
.11 VAP-HH24-90-95	7/16/14	0830	✓	✓	W
.12 Trip Blank -1	7/17/14	—	✓	✓	MeOH

VOC/1,4-Dioxane	SRP/1,4-Dioxane	Foc																	
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**REMARKS**

Special Instructions/Comments: **\* All samples Rush TAT \***  Special QA/QC Instructions(✓):

Laboratory Information and Receipt		Relinquished By		Received By		Relinquished By		Laboratory Received By	
Lab Name: <b>Merit</b>	Cooler Custody Seal (✓) <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	Printed Name: <b>Austin Westhuis</b>	Signature: _____	Printed Name: <b>Jim Glass</b>	Signature: _____	Printed Name: <b>Kevin George</b>	Signature: _____	Printed Name: <b>Kevin George</b>	Signature: _____
<input checked="" type="checkbox"/> Cooler packed with ice (✓)	Sample Receipt: _____	Firm: <b>ARCADIS</b>	Date/Time: <b>7/17/14 1400</b>	Firm/Container: <b>Merit</b>	Date/Time: <b>7-17-14 1400</b>	Firm/Container: <b>Merit</b>	Date/Time: <b>7-17-14</b>	Firm: <b>Merit</b>	Date/Time: <b>7/17/14 1420</b>
Specify Turnaround Requirements: <b>Rush</b>	Condition/Cooler Temp: <b>5.8</b>								



# Analytical Laboratory Report

Report ID: S61930.01(02)

Generated on 07/23/2014

Replaces report S61930.01(01) generated on 07/22/2014

## Report to

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Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837

Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright, Jeff Davin

## Report produced by

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Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)

Barbara Ball (bball@meritlabs.com)

## Report Summary

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Lab Sample ID(s): S61930.01-S61930.06

Project: B0064480.0014.00102 RACER Lansing / Lansing, MI

Collected Date: 07/16/2014 - 07/17/2014

Submitted Date/Time: 07/18/2014 12:35

Sampled by: Austin Westhuis

P.O. #: B0064480.0014.00102

## Report Notes

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Results relate only to items tested as received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

## Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)

IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)

Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

## Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S61930.01	SB-HC19_65	Soil	07/16/2014 14:15
S61930.02	SB-GX24_75	Soil	07/17/2014 14:35
S61930.03	VAP-GX24_90-95	Water	07/17/2014 16:35
S61930.04	SB-HC29_3	Soil	07/16/2014 10:10
S61930.05	VAP-HC29_85-90	Water	07/17/2014 08:20
S61930.06	Trip Blank-2	Methanol	07/16/2014 00:01



# Analytical Laboratory Report

Lab Sample ID: S61930.01  
 Sample Tag: SB-HC19\_65  
 Collected Date/Time: 07/16/2014 14:15  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.7	IR
1	4oz Glass	None	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	84	%	1	Std M 2540 B	07/21/14 15:00	ASB		
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### Organics - Volatiles

1,4-Dioxane	74	ug/kg	3	SW8260B - SIM	07/23/14 08:17	JGH	123-91-1	1
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### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	76-13-1	
Acetone	Not detected	ug/kg	680	5035/8260B	07/22/14 14:00	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	680	5035/8260B	07/22/14 14:00	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	680	5035/8260B	07/22/14 14:00	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	156-59-2	
Chloroform	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	680	5035/8260B	07/22/14 14:00	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	680	5035/8260B	07/22/14 14:00	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	124-48-1	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61930.01 (continued)

Sample Tag: SB-HC19\_65

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/22/14 14:00	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:00	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61930.02  
 Sample Tag: SB-GX24\_75  
 Collected Date/Time: 07/17/2014 14:35  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.7	IR
1	4oz Glass	None	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	86	%	1	Std M 2540 B	07/21/14 15:00	ASB		
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### Organics - Volatiles

1,4-Dioxane	73	ug/kg	3	SW8260B - SIM	07/23/14 08:36	JGH	123-91-1	1
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### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	76-13-1	
Acetone	Not detected	ug/kg	640	5035/8260B	07/22/14 14:20	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	640	5035/8260B	07/22/14 14:20	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	640	5035/8260B	07/22/14 14:20	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	156-59-2	
Chloroform	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	640	5035/8260B	07/22/14 14:20	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	640	5035/8260B	07/22/14 14:20	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	56-23-5	
Benzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	10061-01-5	
Toluene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	124-48-1	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61930.02 (continued)

Sample Tag: SB-GX24\_75

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
1,2-Dibromoethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/22/14 14:20	JGH		
o-Xylene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	95-47-6	
Styrene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	98-82-8	
Bromoform	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	5035/8260B	07/22/14 14:20	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61930.03  
 Sample Tag: VAP-GX24\_90-95  
 Collected Date/Time: 07/17/2014 16:35  
 Matrix: Water  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

pH check for VOCs	<2	STD Units		N/A	07/19/14 18:01	LBR		
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### Organics - Volatiles

1,4-Dioxane	12	ug/L	5	SW8260B - SIM	07/18/14 19:33	JGH	123-91-1	
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### TCL Volatile Organics 8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	76-13-1	
Acetone	Not detected	ug/L	10	SW8260B	07/18/14 16:39	JGH	67-64-1	
Carbon disulfide	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-15-0	
Methyl Acetate	Not detected	ug/L	10	SW8260B	07/18/14 16:39	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260B	07/18/14 16:39	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-71-8	
Chloromethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	74-87-3	
Vinyl chloride	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-01-4	
Bromomethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	74-83-9	
Chloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-35-4	
Methylene chloride	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	156-59-2	
Chloroform	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	71-55-6	
Cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	10	SW8260B	07/18/14 16:39	JGH	108-10-1	
2-Hexanone	Not detected	ug/L	10	SW8260B	07/18/14 16:39	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	56-23-5	
Benzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	107-06-2	
Trichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	10061-01-5	
Toluene	21	ug/L	1	SW8260B	07/18/14 16:39	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	124-48-1	
Chlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61930.03 (continued)

Sample Tag: VAP-GX24\_90-95

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics 8260 (continued)</b>								
Ethylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260B	07/18/14 16:39	JGH		
o-Xylene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	95-47-6	
Styrene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	98-82-8	
Bromoform	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	95-50-1	
1,2,4-Trichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	120-82-1	
1,2-Dibromoethane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	106-93-4	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	1	SW8260B	07/18/14 16:39	JGH	96-12-8	



# Analytical Laboratory Report

Lab Sample ID: S61930.04  
 Sample Tag: SB-HC29\_3  
 Collected Date/Time: 07/16/2014 10:10  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.7	IR
1	4oz Glass	None	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	82	%	1	Std M 2540 B	07/21/14 15:00	ASB		
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### Organics - Volatiles

1,4-Dioxane	Not detected	ug/kg	3	SW8260B - SIM	07/23/14 08:56	JGH	123-91-1	1
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### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	76-13-1	
Acetone	Not detected	ug/kg	700	5035/8260B	07/22/14 14:40	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	700	5035/8260B	07/22/14 14:40	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	700	5035/8260B	07/22/14 14:40	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	156-59-2	
Chloroform	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	700	5035/8260B	07/22/14 14:40	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	700	5035/8260B	07/22/14 14:40	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	56-23-5	
Benzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	10061-01-5	
Toluene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	124-48-1	

1-Sampled from 4oz jar



# Analytical Laboratory Report

Lab Sample ID: S61930.04 (continued)

Sample Tag: SB-HC29\_3

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
1,2-Dibromoethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/22/14 14:40	JGH		
o-Xylene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	95-47-6	
Styrene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	98-82-8	
Bromoform	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	70	5035/8260B	07/22/14 14:40	JGH	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61930.05  
 Sample Tag: VAP-HC29\_85-90  
 Collected Date/Time: 07/17/2014 08:20  
 Matrix: Water  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

pH check for VOCs <2 STD Units N/A 07/19/14 18:06 LBR

### Organics - Volatiles

1,4-Dioxane 77 ug/L 5 SW8260B - SIM 07/18/14 19:51 JGH 123-91-1

### TCL Volatile Organics 8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	76-13-1	
Acetone	19	ug/L	10	SW8260B	07/18/14 17:01	JGH	67-64-1	
Carbon disulfide	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-15-0	
Methyl Acetate	Not detected	ug/L	10	SW8260B	07/18/14 17:01	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260B	07/18/14 17:01	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-71-8	
Chloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	74-87-3	
Vinyl chloride	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-01-4	
Bromomethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	74-83-9	
Chloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-35-4	
Methylene chloride	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	156-59-2	
Chloroform	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	71-55-6	
Cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	10	SW8260B	07/18/14 17:01	JGH	108-10-1	
2-Hexanone	Not detected	ug/L	10	SW8260B	07/18/14 17:01	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	56-23-5	
Benzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	107-06-2	
Trichloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	10061-01-5	
Toluene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	124-48-1	
Chlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61930.05 (continued)

Sample Tag: VAP-HC29\_85-90

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics 8260 (continued)</b>								
Ethylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260B	07/18/14 17:01	JGH		
o-Xylene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	95-47-6	
Styrene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	98-82-8	
Bromoform	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	95-50-1	
1,2,4-Trichlorobenzene	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	120-82-1	
1,2-Dibromoethane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	106-93-4	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	1	SW8260B	07/18/14 17:01	JGH	96-12-8	



# Analytical Laboratory Report

Lab Sample ID: S61930.06  
 Sample Tag: Trip Blank-2  
 Collected Date/Time: 07/16/2014 00:01  
 Matrix: Methanol  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Organics - Volatiles

1,4-Dioxane	Not detected	ug/kg	300	SW8260B - SIM	07/23/14 13:53	JGH	123-91-1	
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### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	76-13-1	
Acetone	Not detected	ug/kg	500	5035/8260B	07/22/14 15:01	JGH	67-64-1	
Carbon disulfide	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-15-0	
Methyl Acetate	Not detected	ug/kg	500	5035/8260B	07/22/14 15:01	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	500	5035/8260B	07/22/14 15:01	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-71-8	
Chloromethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	74-87-3	
Vinyl chloride	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-01-4	
Bromomethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	74-83-9	
Chloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-35-4	
Methylene chloride	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	156-59-2	
Chloroform	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	71-55-6	
Cyclohexane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	500	5035/8260B	07/22/14 15:01	JGH	108-10-1	
2-Hexanone	Not detected	ug/kg	500	5035/8260B	07/22/14 15:01	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	56-23-5	
Benzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	107-06-2	
Trichloroethene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	10061-01-5	
Toluene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	106-93-4	
Chlorobenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	79-34-5	
Ethylbenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	5035/8260B	07/22/14 15:01	JGH		



# Analytical Laboratory Report

Lab Sample ID: S61930.06 (continued)

Sample Tag: Trip Blank-2

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
o-Xylene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	95-47-6	
Styrene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	98-82-8	
Bromoform	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	50	5035/8260B	07/22/14 15:01	JGH	120-82-1	





# Analytical Laboratory Report

Report ID: S61951.01(01)  
Generated on 07/22/2014

## Report to

---

Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837  
Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

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Lab Sample ID(s): S61951.01  
Project: RACER-Lansing 1,4-D Investigation B0064480.0014.00102  
Collected Date: 07/18/2014  
Submitted Date/Time: 07/21/2014 11:45  
Sampled by: Adam Richmond  
P.O. #: B0064480.0014.00102

## Report Notes

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Results relate only to items tested as received by the laboratory.  
Methods may be modified for improved performance.  
Results reported on a dry weight basis where applicable.  
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).  
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.  
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

## Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)  
IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)  
Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S61951.01	VAP-GX19_85-90	Groundwater	07/18/2014 16:30



# Analytical Laboratory Report

Lab Sample ID: S61951.01  
 Sample Tag: VAP-GX19\_85-90  
 Collected Date/Time: 07/18/2014 16:30  
 Matrix: Groundwater  
 COC Reference: 72511

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	7.7	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Extraction / Prep.

pH check for VOCs	<2	STD Units		N/A	07/22/14 10:00	WAT		
-------------------	----	-----------	--	-----	----------------	-----	--	--

### Organics - Volatiles

1,4-Dioxane	18	ug/L	5	SW8260B - SIM	07/21/14 20:20	JGH	123-91-1	
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### TCL Volatile Organics 8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	76-13-1	
Acetone	Not detected	ug/L	10	SW8260B	07/21/14 19:03	JGH	67-64-1	
Carbon disulfide	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-15-0	
Methyl Acetate	Not detected	ug/L	10	SW8260B	07/21/14 19:03	JGH	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	1634-04-4	
2-Butanone (MEK)	Not detected	ug/L	10	SW8260B	07/21/14 19:03	JGH	78-93-3	
Dichlorodifluoromethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-71-8	
Chloromethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	74-87-3	
Vinyl chloride	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-01-4	
Bromomethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	74-83-9	
Chloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-00-3	
Trichlorofluoromethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-69-4	
1,1-Dichloroethene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-35-4	
Methylene chloride	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	156-60-5	
1,1-Dichloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	156-59-2	
Chloroform	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	71-55-6	
Cyclohexane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/L	10	SW8260B	07/21/14 19:03	JGH	108-10-1	
2-Hexanone	Not detected	ug/L	10	SW8260B	07/21/14 19:03	JGH	591-78-6	
Carbon tetrachloride	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	56-23-5	
Benzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	71-43-2	
1,2-Dichloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	107-06-2	
Trichloroethene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	79-01-6	
1,2-Dichloropropane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	78-87-5	
Bromodichloromethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-27-4	
Methyl cyclohexane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	10061-01-5	
Toluene	3	ug/L	1	SW8260B	07/21/14 19:03	JGH	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	79-00-5	
Tetrachloroethene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	127-18-4	
Dibromochloromethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	124-48-1	
Chlorobenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61951.01 (continued)

Sample Tag: VAP-GX19\_85-90

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics 8260 (continued)</b>								
Ethylbenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	100-41-4	
p,m-Xylene	Not detected	ug/L	2	SW8260B	07/21/14 19:03	JGH		
o-Xylene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	95-47-6	
Styrene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	100-42-5	
Isopropylbenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	98-82-8	
Bromoform	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	95-50-1	
1,2,4-Trichlorobenzene	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	120-82-1	
1,2-Dibromoethane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	106-93-4	
1,2-Dibromo-3-chloropropane	Not detected	ug/L	1	SW8260B	07/21/14 19:03	JGH	96-12-8	



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 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

72511

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Randy Christensen  
 COMPANY ARCADIS  
 ADDRESS \_\_\_\_\_  
 CITY Brighton STATE MI ZIP CODE \_\_\_\_\_  
 PHONE NO. 810-225-1940 FAX NO. 810-229-8837 P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Randy.Christensen@arcadis-us.com QUOTE NO. \_\_\_\_\_

CONTACT NAME ASAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME RACER January 14-0 Investigation BOD64480.004.00102 SAMPLER(S) - PLEASE PRINT/SIGN NAME Adam Richmond  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

**# Containers & Preservatives**

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives													
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER							
<u>01951.01</u>	<u>7/19/14</u>	<u>10:30</u>	<u>VAP-GX19_85-90</u>	<u>SW</u>	<u>3</u>	<u>3</u>													

VOC, 1,4-D, oxane

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions

All samples rush TAT also send results to Jesse Wright at jesse.wright@arcadis-us.com

RELINQUISHED BY: Kristen Horvath  Sampler DATE 7/21/14 TIME 11:45  
 SIGNATURE/ORGANIZATION [Signature] ARCADIS  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: Kevin George DATE 7/21/14 TIME 11:45  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 7.7



# Analytical Laboratory Report

Report ID: S61966.01(02)

Generated on 07/24/2014

Replaces report S61966.01(01) generated on 07/23/2014

## Report to

Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837

Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright, Jeff Davin

## Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)

Barbara Ball (bball@meritlabs.com)

## Report Summary

Lab Sample ID(s): S61966.01-S61966.06

Project: B0064480.0014.00102 RACER Lansing / Lansing, MI

Collected Date: 07/18/2014 - 07/22/2014

Submitted Date/Time: 07/22/2014 15:15

Sampled by: Adam Richmond

P.O. #: B0064480.0014.00102

All analyses complete.

## Report Notes

Results relate only to items tested as received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)

IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)

Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

## Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S61966.01	SB-GX19_70	Soil	07/18/2014 14:53
S61966.02	SB-GX26_19	Soil	07/19/2014 10:45
S61966.03	SB-HA24_70	Soil	07/21/2014 16:00
S61966.04	SB-GX21_13	Soil	07/21/2014 12:50
S61966.05	SB-GX21_15	Soil	07/21/2014 13:00
S61966.06	Trip Blank-3	Methanol	07/22/2014 00:01



# Analytical Laboratory Report

Lab Sample ID: S61966.01  
 Sample Tag: SB-GX19\_70  
 Collected Date/Time: 07/18/2014 14:53  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR
1	4oz Glass	None	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	79	%	1	Std M 2540 B	07/22/14 19:40	ASB		
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### Organics - Volatiles

1,4-Dioxane	20	ug/kg	3	SW8260B - SIM	07/23/14 13:51	JGH	123-91-1	1
1,4-Dioxane (Replicate 01)	15	ug/kg	3	SW8260B - SIM	07/23/14 18:17	JGH	123-91-1	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	76-13-1	
Acetone	Not detected	ug/kg	760	SW5035A/8260C	07/23/14 01:53	WAT	67-64-1	
Carbon disulfide	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-15-0	
Methyl Acetate	Not detected	ug/kg	760	SW5035A/8260C	07/23/14 01:53	WAT	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	760	SW5035A/8260C	07/23/14 01:53	WAT	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-71-8	
Chloromethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	74-87-3	
Vinyl chloride	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-01-4	
Bromomethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	74-83-9	
Chloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-35-4	
Methylene chloride	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	156-59-2	
Chloroform	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	71-55-6	
Cyclohexane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	760	SW5035A/8260C	07/23/14 01:53	WAT	108-10-1	
2-Hexanone	Not detected	ug/kg	760	SW5035A/8260C	07/23/14 01:53	WAT	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	56-23-5	
Benzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	107-06-2	
Trichloroethene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	78-87-5	
Bromodichloromethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	10061-01-5	
Toluene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	79-00-5	
Tetrachloroethene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	127-18-4	

1-Tune was out of control parameters.



# Analytical Laboratory Report

Lab Sample ID: S61966.01 (continued)

Sample Tag: SB-GX19\_70

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Dibromochloromethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	106-93-4	
Chlorobenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	79-34-5	
Ethylbenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	100-41-4	
p,m-Xylene	Not detected	ug/kg	200	SW5035A/8260C	07/23/14 01:53	WAT		
o-Xylene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	95-47-6	
Styrene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	100-42-5	
Isopropylbenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	98-82-8	
Bromoform	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	80	SW5035A/8260C	07/23/14 01:53	WAT	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61966.02  
 Sample Tag: SB-GX26\_19  
 Collected Date/Time: 07/19/2014 10:45  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR
1	4oz Glass	None	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	91	%	1	Std M 2540 B	07/22/14 19:40	ASB		
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### Organics - Volatiles

1,4-Dioxane	Not detected	ug/kg	3	SW8260B - SIM	07/23/14 14:11	JGH	123-91-1	1
1,4-Dioxane (Replicate 01)	Not detected	ug/kg	2	SW8260B - SIM	07/23/14 18:37	JGH	123-91-1	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	76-13-1	
Acetone	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:14	WAT	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-15-0	
Methyl Acetate	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:14	WAT	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:14	WAT	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-71-8	
Chloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-01-4	
Bromomethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	74-83-9	
Chloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-35-4	
Methylene chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	156-60-5	
1,1-Dichloroethane	2,420	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-34-3	
cis-1,2-Dichloroethene	170	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	156-59-2	
Chloroform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	71-55-6	
Cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:14	WAT	108-10-1	
2-Hexanone	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:14	WAT	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	56-23-5	
Benzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	107-06-2	
Trichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	10061-01-5	
Toluene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	127-18-4	

1-Tune was out of control parameters.



# Analytical Laboratory Report

Lab Sample ID: S61966.02 (continued)

Sample Tag: SB-GX26\_19

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Dibromochloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	SW5035A/8260C	07/23/14 02:14	WAT		
o-Xylene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	95-47-6	
Styrene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	98-82-8	
Bromoform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:14	WAT	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61966.03  
Sample Tag: SB-HA24\_70  
Collected Date/Time: 07/21/2014 16:00  
Matrix: Soil  
COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR
1	4oz Glass	None	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	82	%	1	Std M 2540 B	07/22/14 19:40	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	5	ug/kg	2	SW8260B - SIM	07/23/14 14:31	JGH	123-91-1	1
1,4-Dioxane (Replicate 01)	5	ug/kg	3	SW8260B - SIM	07/23/14 18:57	JGH	123-91-1	

1-Tune was out of control parameters.



# Analytical Laboratory Report

Lab Sample ID: S61966.04  
 Sample Tag: SB-GX21\_13  
 Collected Date/Time: 07/21/2014 12:50  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR
1	4oz Glass	None	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	88	%	1	Std M 2540 B	07/22/14 19:40	ASB		
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### Organics - Volatiles

#### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	76-13-1	
Acetone	Not detected	ug/kg	630	SW5035A/8260C	07/23/14 02:34	WAT	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-15-0	
Methyl Acetate	Not detected	ug/kg	630	SW5035A/8260C	07/23/14 02:34	WAT	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	630	SW5035A/8260C	07/23/14 02:34	WAT	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-71-8	
Chloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-01-4	
Bromomethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	74-83-9	
Chloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-35-4	
Methylene chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	156-59-2	
Chloroform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	71-55-6	
Cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	630	SW5035A/8260C	07/23/14 02:34	WAT	108-10-1	
2-Hexanone	Not detected	ug/kg	630	SW5035A/8260C	07/23/14 02:34	WAT	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	56-23-5	
Benzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	107-06-2	
Trichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	10061-01-5	
Toluene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	79-00-5	
Tetrachloroethene	140	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	127-18-4	
Dibromochloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	79-34-5	



# Analytical Laboratory Report

Lab Sample ID: S61966.04 (continued)

Sample Tag: SB-GX21\_13

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Ethylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	SW5035A/8260C	07/23/14 02:34	WAT		
o-Xylene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	95-47-6	
Styrene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	98-82-8	
Bromoform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:34	WAT	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61966.05  
 Sample Tag: SB-GX21\_15  
 Collected Date/Time: 07/21/2014 13:00  
 Matrix: Soil  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR
1	4oz Glass	None	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Inorganics

Total Solids	91	%	1	Std M 2540 B	07/22/14 19:40	ASB		
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### Organics - Volatiles

1,4-Dioxane	19	ug/kg	2	SW8260B - SIM	07/23/14 14:50	JGH	123-91-1	1
1,4-Dioxane (Replicate 01)	21	ug/kg	3	SW8260B - SIM	07/23/14 19:17	JGH	123-91-1	

### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	76-13-1	
Acetone	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:55	WAT	67-64-1	
Carbon disulfide	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-15-0	
Methyl Acetate	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:55	WAT	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:55	WAT	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-71-8	
Chloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	74-87-3	
Vinyl chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-01-4	
Bromomethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	74-83-9	
Chloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-35-4	
Methylene chloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-09-2	
trans-1,2-Dichloroethene	260	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	156-60-5	
1,1-Dichloroethane	1,250	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-34-3	
cis-1,2-Dichloroethene	4,580	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	156-59-2	
Chloroform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	71-55-6	
Cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:55	WAT	108-10-1	
2-Hexanone	Not detected	ug/kg	620	SW5035A/8260C	07/23/14 02:55	WAT	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	56-23-5	
Benzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	107-06-2	
Trichloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	78-87-5	
Bromodichloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	10061-01-5	
Toluene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	79-00-5	
Tetrachloroethene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	127-18-4	

1-Tune was out of control parameters.



# Analytical Laboratory Report

Lab Sample ID: S61966.05 (continued)

Sample Tag: SB-GX21\_15

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
Dibromochloromethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	106-93-4	
Chlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	79-34-5	
Ethylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	SW5035A/8260C	07/23/14 02:55	WAT		
o-Xylene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	95-47-6	
Styrene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	100-42-5	
Isopropylbenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	98-82-8	
Bromoform	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	60	SW5035A/8260C	07/23/14 02:55	WAT	120-82-1	



# Analytical Laboratory Report

Lab Sample ID: S61966.06  
 Sample Tag: Trip Blank-3  
 Collected Date/Time: 07/22/2014 00:01  
 Matrix: Methanol  
 COC Reference:

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	5.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### Organics - Volatiles

1,4-Dioxane	Not detected	ug/kg	300	SW8260B - SIM	07/23/14 14:12	JGH	123-91-1	
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### TCL Volatile Organics HighLevel 5035/8260

1,1,2-Trichloro-1,2,2-trifluoroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	76-13-1	
Acetone	Not detected	ug/kg	500	SW5035A/8260C	07/23/14 03:16	WAT	67-64-1	
Carbon disulfide	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-15-0	
Methyl Acetate	Not detected	ug/kg	500	SW5035A/8260C	07/23/14 03:16	WAT	79-20-9	
tert-Methyl butyl ether (MTBE)	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	1634-04-4	
2-Butanone (MEK)	Not detected	ug/kg	500	SW5035A/8260C	07/23/14 03:16	WAT	78-93-3	
Dichlorodifluoromethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-71-8	
Chloromethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	74-87-3	
Vinyl chloride	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-01-4	
Bromomethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	74-83-9	
Chloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-00-3	
Trichlorofluoromethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-69-4	
1,1-Dichloroethene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-35-4	
Methylene chloride	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-09-2	
trans-1,2-Dichloroethene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	156-60-5	
1,1-Dichloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-34-3	
cis-1,2-Dichloroethene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	156-59-2	
Chloroform	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	67-66-3	
1,1,1-Trichloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	71-55-6	
Cyclohexane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	110-82-7	
4-Methyl-2-pentanone (MIBK)	Not detected	ug/kg	500	SW5035A/8260C	07/23/14 03:16	WAT	108-10-1	
2-Hexanone	Not detected	ug/kg	500	SW5035A/8260C	07/23/14 03:16	WAT	591-78-6	
Carbon tetrachloride	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	56-23-5	
Benzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	71-43-2	
1,2-Dichloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	107-06-2	
Trichloroethene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	79-01-6	
1,2-Dichloropropane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	78-87-5	
Bromodichloromethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-27-4	
Methyl cyclohexane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	108-87-2	
cis-1,3-Dichloropropene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	10061-01-5	
Toluene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	108-88-3	
trans-1,3-Dichloropropene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	10061-02-6	
1,1,2-Trichloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	79-00-5	
Tetrachloroethene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	127-18-4	
Dibromochloromethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	124-48-1	
1,2-Dibromoethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	106-93-4	
Chlorobenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	108-90-7	
1,1,2,2-Tetrachloroethane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	79-34-5	
Ethylbenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	100-41-4	
p,m-Xylene	Not detected	ug/kg	100	SW5035A/8260C	07/23/14 03:16	WAT		



# Analytical Laboratory Report

Lab Sample ID: S61966.06 (continued)

Sample Tag: Trip Blank-3

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles (continued)</b>								
<b>TCL Volatile Organics HighLevel 5035/8260 (continued)</b>								
o-Xylene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	95-47-6	
Styrene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	100-42-5	
Isopropylbenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	98-82-8	
Bromoform	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	75-25-2	
1,3-Dichlorobenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	541-73-1	
1,4-Dichlorobenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	106-46-7	
1,2-Dichlorobenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	95-50-1	
1,2-Dibromo-3-chloropropane	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	96-12-8	
1,2,4-Trichlorobenzene	Not detected	ug/kg	50	SW5035A/8260C	07/23/14 03:16	WAT	120-82-1	





# Analytical Laboratory Report

Supplemental Report

Report ID: S62057.01(02)

Generated on 08/04/2014

Replaces report S62057.01(01) generated on 07/30/2014

## Report to

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Attention: Jesse Wright  
Arcadis  
132 E. Washington Street  
Indianapolis, IN 46204

Phone: 317-236-2860 FAX:  
Email: jesse.wright@arcadis-us.com

## Report produced by

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Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
Kevin George (kgeorge@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

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Lab Sample ID(s): S62057.01-S62057.20  
Project: RACER Trust / B0064480.0014  
Collected Date: 07/15/2014 - 07/21/2014  
Submitted Date/Time: 07/29/2014 08:00  
Sampled by: Adam Richmond  
P.O. #: B0064480.0014

All samples completed

## Report Notes

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Results relate only to items tested as received by the laboratory.  
Methods may be modified for improved performance.  
Results reported on a dry weight basis where applicable.  
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).  
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.  
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

## Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)  
IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)  
Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

Supplemental Report

## Sample Summary (20 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S62057.01	GX24_15	Water	07/17/2014 09:55
S62057.02	GX24_24	Water	07/17/2014 10:05
S62057.03	GX24_75	Water	07/17/2014 14:35
S62057.04	GX24_21	Water	07/17/2014 10:00
S62057.05	GX19_25	Water	07/18/2014 10:37
S62057.06	GX19_70	Water	07/18/2014 14:53
S62057.07	GX21_18	Water	07/21/2014 13:15
S62057.08	GX24_26.5	Water	07/17/2014 10:07
S62057.09	GX29_24.5	Water	07/17/2014 12:40
S62057.10	HA24_70	Water	07/21/2014 16:00
S62057.11	HA24_73	Water	07/21/2014 16:20
S62057.12	HA24_76	Water	07/21/2014 16:25
S62057.13	HC24_62	Water	07/15/2014 11:20
S62057.14	HC24_59	Water	07/15/2014 11:00
S62057.15	HC24_92	Water	07/15/2014 15:05
S62057.16	HH24_30	Water	07/15/2014 10:25
S62057.17	HC19_62	Water	07/16/2014 14:10
S62057.18	HC19_65	Water	07/16/2014 14:15
S62057.19	HC29_79	Water	07/16/2014 15:35
S62057.20	HC24_74	Water	07/15/2014 13:35



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.01  
Sample Tag: GX24\_15  
Collected Date/Time: 07/17/2014 09:55  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	1,220	ug/L	10	SW8260B - SIM	07/29/14 21:39	WAT	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.02  
Sample Tag: GX24\_24  
Collected Date/Time: 07/17/2014 10:05  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	470	ug/L	50	SW8260B - SIM	07/29/14 21:19	JGH	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.03  
Sample Tag: GX24\_75  
Collected Date/Time: 07/17/2014 14:35  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	51	ug/L	1	SW8260B - SIM	07/29/14 15:42	WAT	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.04  
Sample Tag: GX24\_21  
Collected Date/Time: 07/17/2014 10:00  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	930	ug/L	10	SW8260B - SIM	07/29/14 21:59	WAT	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.05  
Sample Tag: GX19\_25  
Collected Date/Time: 07/18/2014 10:37  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	9	ug/L	5	SW8260B - SIM	07/29/14 16:01	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.06  
Sample Tag: GX19\_70  
Collected Date/Time: 07/18/2014 14:53  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	17	ug/L	5	SW8260B - SIM	07/29/14 16:21	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.07  
Sample Tag: GX21\_18  
Collected Date/Time: 07/21/2014 13:15  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	86	ug/L	1	SW8260B - SIM	07/29/14 16:42	WAT	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.08  
Sample Tag: GX24\_26.5  
Collected Date/Time: 07/17/2014 10:07  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	280	ug/L	10	SW8260B - SIM	07/29/14 20:59	WAT	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.09  
Sample Tag: GX29\_24.5  
Collected Date/Time: 07/17/2014 12:40  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	34	ug/L	5	SW8260B - SIM	07/29/14 17:01	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.10  
Sample Tag: HA24\_70  
Collected Date/Time: 07/21/2014 16:00  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	6	ug/L	5	SW8260B - SIM	07/29/14 17:21	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.11  
Sample Tag: HA24\_73  
Collected Date/Time: 07/21/2014 16:20  
Matrix: Water  
COC Reference: 73748

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	36	ug/L	5	SW8260B - SIM	07/29/14 17:41	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.12  
Sample Tag: HA24\_76  
Collected Date/Time: 07/21/2014 16:25  
Matrix: Water  
COC Reference: 73748

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	30	ug/L	5	SW8260B - SIM	07/29/14 18:01	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.13  
Sample Tag: HC24\_62  
Collected Date/Time: 07/15/2014 11:20  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	5	ug/L	5	SW8260B - SIM	07/29/14 18:21	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.14  
Sample Tag: HC24\_59  
Collected Date/Time: 07/15/2014 11:00  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	22	ug/L	5	SW8260B - SIM	07/29/14 18:41	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.15  
Sample Tag: HC24\_92  
Collected Date/Time: 07/15/2014 15:05  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	07/29/14 19:01	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.16  
Sample Tag: HH24\_30  
Collected Date/Time: 07/15/2014 10:25  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	5	ug/L	1	SW8260B - SIM	07/29/14 19:20	WAT	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.17  
Sample Tag: HC19\_62  
Collected Date/Time: 07/16/2014 14:10  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	331	ug/L	5	SW8260B - SIM	07/29/14 19:40	JGH	123-91-1	E
1,4-Dioxane (Replicate 01)	280	ug/L	30	SW8260B - SIM	08/01/14 15:09	JGH	123-91-1	Y

E-Concentration exceeds calibration range

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.18  
Sample Tag: HC19\_65  
Collected Date/Time: 07/16/2014 14:15  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	61	ug/L	5	SW8260B - SIM	07/29/14 20:00	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.19  
Sample Tag: HC29\_79  
Collected Date/Time: 07/16/2014 15:35  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	33	ug/L	5	SW8260B - SIM	07/29/14 20:20	JGH	123-91-1	



# Analytical Laboratory Report

Supplemental Report

Lab Sample ID: S62057.20  
Sample Tag: HC24\_74  
Collected Date/Time: 07/15/2014 13:35  
Matrix: Water  
COC Reference: 73749

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	4.8	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	60	ug/L	5	SW8260B - SIM	07/29/14 20:39	JGH	123-91-1	



**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Jesse Wright  
 COMPANY Arcadis  
 ADDRESS 132 E Washington Street  
 CITY Indianapolis STATE IN ZIP CODE 46204  
 PHONE NO. 317-496-9248 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Jesse.Wright@arcadis-us.com QUOTE NO. \_\_\_\_\_

CONTACT NAME SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME B0064480.0014 / RACER Trust SAMPLER(S) - PLEASE PRINT/SIGN NAME Adam Richmond  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER 1 week TAT  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE: SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	Certifications <input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water <input type="checkbox"/> DoD <input type="checkbox"/> NPDES Project Locations <input type="checkbox"/> Detroit <input type="checkbox"/> New York <input type="checkbox"/> Other _____ Special Instructions
	DATE	TIME											
62057.13	7/15/14	1120	HC 24 - 62	W	2	/							1, 4 Dioxane
.14	7/15/14	1100	HC 24 - 59	W	2	/							
.15	7/15/14	1505	HC 24 - 92	W	2	/							
.16	7/15/14	1025	HH 24 - 30	W	2	/							
.17	7/16/14	1410	HC 19 - 62	W	2	/							
.18	7/16/14	1415	HC 19 - 65	W	2	/							
.19	7/16/14	1535	HC 29 - 79	W	2	/							
.20	7/15/14	1335	HC 24 - 74	W	2	/							

RELINQUISHED BY: [Signature] / Arcadis  Sampler DATE 7/23/14 TIME 1100  
 RECEIVED BY: [Signature] / Merit DATE 7/23/14 TIME 1700  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: [Signature] / Merit Drop Box DATE 7/23/14 TIME 800  
 RECEIVED BY: [Signature] / Merit DATE 7/23/14 TIME 800  
 SEAL NO. \_\_\_\_\_ SEAL INTACT \_\_\_\_\_ INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL 4.8  
 SEAL NO. \_\_\_\_\_ SEAL INTACT \_\_\_\_\_ INITIALS \_\_\_\_\_



# Analytical Laboratory Report

Report ID: S62100.01(01)  
Generated on 08/14/2014

Report to

Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837  
Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright, Jeff Davin

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S62100.01-S62100.12  
Project: B0064480.0014.00102 RACER Lansing  
Collected Date: 07/30/2014 - 07/31/2014  
Submitted Date/Time: 08/01/2014 08:00  
Sampled by: Adam Richmond  
P.O. #: B0064480.0014.00102

Report Notes

Results relate only to items tested as received by the laboratory.  
Methods may be modified for improved performance.  
Results reported on a dry weight basis where applicable.  
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).  
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.  
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)  
IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)  
Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

## Sample Summary (12 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S62100.01	SB-GX24b_6	Soil	07/30/2014 16:05
S62100.02	SB-GX24b_9	Soil	07/30/2014 16:10
S62100.03	SB-GX24b_13	Soil	07/30/2014 16:15
S62100.04	SB-GX24b_16	Soil	07/30/2014 16:20
S62100.05	SB-GX24b_19	Soil	07/30/2014 16:25
S62100.06	SB-GX24b_23	Soil	07/30/2014 16:30
S62100.07	SB-GX24b_26	Soil	07/30/2014 16:35
S62100.08	SB-GX24b_29	Soil	07/30/2014 16:40
S62100.09	SB-GX24b_69	Soil	07/31/2014 08:55
S62100.10	SB-GX24b_73	Soil	07/31/2014 09:00
S62100.11	SB-GX24b_76	Soil	07/31/2014 09:05
S62100.12	VAP-SB-HM14_90-95	Groundwater	07/30/2014 14:00



# Analytical Laboratory Report

Lab Sample ID: S62100.01  
Sample Tag: SB-GX24b\_6  
Collected Date/Time: 07/30/2014 16:05  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	89	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	600	ug/kg	400	SW8260B - SIM	08/01/14 16:03	JGH	123-91-1	
1,4-Dioxane	170	ug/kg	10	SW8260B - SIM	08/12/14 15:36	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.02  
Sample Tag: SB-GX24b\_9  
Collected Date/Time: 07/30/2014 16:10  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### ***Inorganics***

Total Solids	87	%	1	Std M 2540 B	08/02/14 17:30	ASB		
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### ***Organics - Volatiles***

1,4-Dioxane	Not detected	ug/kg	400	SW8260B - SIM	08/01/14 16:21	JGH	123-91-1	
1,4-Dioxane	Not detected	ug/kg	3	SW8260B - SIM	08/13/14 13:39	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.03  
Sample Tag: SB-GX24b\_13  
Collected Date/Time: 07/30/2014 16:15  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	90	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	400	ug/kg	300	SW8260B - SIM	08/01/14 16:40	JGH	123-91-1	
1,4-Dioxane	90	ug/kg	10	SW8260B - SIM	08/12/14 16:15	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.04  
 Sample Tag: SB-GX24b\_16  
 Collected Date/Time: 07/30/2014 16:20  
 Matrix: Soil  
 COC Reference: 73751

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Extraction / Prep.</b>								
Acid Rain Zero Headspace Extract	Completed			SW1312	08/05/14 17:50	WAR		
<b>Inorganics</b>								
Total Solids	87	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	36	ug/L	5	SW8260B	08/06/14 14:14	JGH	123-91-1	
1,4-Dioxane	2,800	ug/kg	300	SW8260B - SIM	08/01/14 16:58	JGH	123-91-1	
1,4-Dioxane	760	ug/kg	50	SW8260B - SIM	08/12/14 19:12	WAT	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S62100.05  
 Sample Tag: SB-GX24b\_19  
 Collected Date/Time: 07/30/2014 16:25  
 Matrix: Soil  
 COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Extraction / Prep.</b>								
Acid Rain Zero Headspace Extract	Completed			SW1312	08/05/14 17:50	WAR		
<b>Inorganics</b>								
Total Solids	89	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	18	ug/L	5	SW8260B	08/06/14 14:32	JGH	123-91-1	
1,4-Dioxane	2,000	ug/kg	300	SW8260B - SIM	08/01/14 17:16	JGH	123-91-1	
1,4-Dioxane	580	ug/kg	50	SW8260B - SIM	08/12/14 19:32	WAT	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S62100.06  
Sample Tag: SB-GX24b\_23  
Collected Date/Time: 07/30/2014 16:30  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	79	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	900	ug/kg	400	SW8260B - SIM	08/01/14 17:34	JGH	123-91-1	
1,4-Dioxane	560	ug/kg	30	SW8260B - SIM	08/13/14 14:19	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.07  
Sample Tag: SB-GX24b\_26  
Collected Date/Time: 07/30/2014 16:35  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### **Inorganics**

Total Solids	85	%	1	Std M 2540 B	08/02/14 17:30	ASB		
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### **Organics - Volatiles**

1,4-Dioxane	Not detected	ug/kg	400	SW8260B - SIM	08/01/14 17:52	JGH	123-91-1	
1,4-Dioxane	100	ug/kg	30	SW8260B - SIM	08/13/14 14:39	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.08  
Sample Tag: SB-GX24b\_29  
Collected Date/Time: 07/30/2014 16:40  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	97	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/kg	400	SW8260B - SIM	08/01/14 18:10	JGH	123-91-1	
1,4-Dioxane	Not detected	ug/kg	3	SW8260B - SIM	08/13/14 14:59	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.09  
Sample Tag: SB-GX24b\_69  
Collected Date/Time: 07/31/2014 08:55  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	83	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/kg	400	SW8260B - SIM	08/01/14 18:29	JGH	123-91-1	
1,4-Dioxane	20	ug/kg	10	SW8260B - SIM	08/13/14 15:38	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.10  
 Sample Tag: SB-GX24b\_73  
 Collected Date/Time: 07/31/2014 09:00  
 Matrix: Soil  
 COC Reference: 73751

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Extraction / Prep.</b>								
Acid Rain Zero Headspace Extract	Completed			SW1312	08/05/14 17:50	WAR		
<b>Inorganics</b>								
Total Solids	84	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B	08/06/14 14:50	JGH	123-91-1	
1,4-Dioxane	Not detected	ug/kg	400	SW8260B - SIM	08/01/14 18:47	JGH	123-91-1	
1,4-Dioxane	40	ug/kg	10	SW8260B - SIM	08/12/14 17:34	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.11  
Sample Tag: SB-GX24b\_76  
Collected Date/Time: 07/31/2014 09:05  
Matrix: Soil  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	MeOH	Yes	9.6	IR
1	4oz Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Inorganics</b>								
Total Solids	87	%	1	Std M 2540 B	08/02/14 17:30	ASB		
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/kg	300	SW8260B - SIM	08/01/14 19:05	JGH	123-91-1	
1,4-Dioxane	10	ug/kg	3	SW8260B - SIM	08/12/14 17:53	WAT	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62100.12  
Sample Tag: VAP-SB-HM14\_90-95  
Collected Date/Time: 07/30/2014 14:00  
Matrix: Groundwater  
COC Reference: 73751

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
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### **Extraction / Prep.**

pH check for VOCs	<2	STD Units		N/A	08/01/14 14:30	LBR		
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### **Organics - Volatiles**

1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	08/01/14 19:24	JGH	123-91-1	
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2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

73751

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Randy Christensen  
 COMPANY ARCADIS  
 ADDRESS 10559 Citation Dr. Ste. 100  
 CITY Brighton STATE MI ZIP CODE 48116  
 PHONE NO. 810.225.1940 FAX NO. 810.229.8837 P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS randy.christensen@arcadis-us.com QUOTE NO. \_\_\_\_\_

CONTACT NAME SAME  
 COMPANY \_\_\_\_\_  
 ADDRESS \_\_\_\_\_  
 CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. \_\_\_\_\_ E-MAIL ADDRESS \_\_\_\_\_

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME B0064480.0014.00102 / RACER Lansing SAMPLER(S) - PLEASE PRINT/SIGN NAME Adam Robinson / Adam  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

**# Containers & Preservatives**

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	1,4 Dioxane SPLP	Certifications		Project Locations		Special Instructions
	DATE	TIME												<input type="checkbox"/> OHIO VAP	<input type="checkbox"/> Drinking Water	<input type="checkbox"/> DoD	<input type="checkbox"/> NPDES	
62100.01	7/30/14	1605	SB-GX246-6	S	2	1					1		X					
.02		1610	SB-GX246-9	S	2	1					1		X					
.03		1615	SB-GX246-13	S	2	1					1		X					
.04		1620	SB-GX246-16	S	2	1					1		X	X				
.05		1625	SB-GX246-19	S	2	1					1		X	X				
.06		1630	SB-GX246-23	S	2	1					1		X					
.07		1635	SB-GX246-26	S	2	1					1		X					
.08		1640	SB-GX246-29	S	2	1					1		X					
.09	7/31/14	0855	SB-GX246-69	S	2	1					1		X					
.10		0900	SB-GX246-73	S	2	1					1		X	X				
.11		0905	SB-GX246-76	S	2	1					1		X					
.12	7/30/14	1400	VAP-SB-HM14-90-95	GW	2		2						X					

RELINQUISHED BY: Adam Robinson  Sampler DATE 7/31/14 TIME 1700  
 RECEIVED BY: Merit Labs Cook/Locher/Mest DATE 7/31/14 TIME 1800  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: Merit Drop Box DATE 8/1/14 TIME 800  
 RECEIVED BY: Kevin Chase DATE 8/1/14 TIME 800  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_ NOTES: TEMP. ON ARRIVAL 9.6  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



# Analytical Laboratory Report

Report ID: S62101.01(01)  
Generated on 08/05/2014

## Report to

---

Attention: Randy Christensen  
Arcadis  
10559 Citation Drive  
Suite 100  
Brighton, MI 48116

Phone: 810-225-1940 FAX: 810-229-8837  
Email: Randy.Christensen@arcadis-us.com

Additional Contacts: Cordelia Swegal, Jesse Wright, Jeff Davin

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

Kevin George (kgeorge@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S62101.01-S62101.11  
Project: B0064480.0014.00102 / RACER Lansing  
Collected Date: 07/31/2014  
Submitted Date/Time: 08/01/2014 08:00  
Sampled by: Adam Richmond  
P.O. #: B0064480.0014.00102

## Report Notes

---

Results relate only to items tested as received by the laboratory.  
Methods may be modified for improved performance.  
Results reported on a dry weight basis where applicable.  
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).  
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.  
Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc..

## Laboratory Certifications:

Michigan DNRE (#9956), DOD/ISO 17025 (#69699), WBENC (#2005110032), Ohio EPA (#CL0002)  
IN Drinking Water (#C-MI-07), NELAC NY (#11814), NCDENR (#680), NC Drinking Water (#26702)  
Some analytes reported may not be certified. Full certification lists are available upon request.

Violetta F. Murshak  
Laboratory Director



# Analytical Laboratory Report

## Sample Summary (11 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S62101.01	GX24b_6	Groundwater	07/31/2014 16:05
S62101.02	GX24b_9	Groundwater	07/31/2014 16:10
S62101.03	GX24b_13	Groundwater	07/31/2014 16:15
S62101.04	GX24b_16	Groundwater	07/31/2014 16:20
S62101.05	GX24b_19	Groundwater	07/31/2014 16:25
S62101.06	GX24b_23	Groundwater	07/31/2014 16:30
S62101.07	GX24b_26	Groundwater	07/31/2014 16:35
S62101.08	GX24b_29	Groundwater	07/31/2014 16:40
S62101.09	GX24b_69	Groundwater	07/31/2014 08:55
S62101.10	GX24b_73	Groundwater	07/31/2014 09:00
S62101.11	GX24b_76	Groundwater	07/31/2014 09:05



# Analytical Laboratory Report

Lab Sample ID: S62101.01  
Sample Tag: GX24b\_6  
Collected Date/Time: 07/31/2014 16:05  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	71	ug/L	5	SW8260B - SIM	08/01/14 15:29	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.02  
Sample Tag: GX24b\_9  
Collected Date/Time: 07/31/2014 16:10  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	08/01/14 15:49	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.03  
Sample Tag: GX24b\_13  
Collected Date/Time: 07/31/2014 16:15  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	44	ug/L	5	SW8260B - SIM	08/01/14 16:08	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.04  
Sample Tag: GX24b\_16  
Collected Date/Time: 07/31/2014 16:20  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	490	ug/L	30	SW8260B - SIM	08/04/14 14:49	JGH	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S62101.05  
Sample Tag: GX24b\_19  
Collected Date/Time: 07/31/2014 16:25  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	320	ug/L	30	SW8260B - SIM	08/04/14 15:09	JGH	123-91-1	Y

Y-Elevated reporting limit due to high target concentration



# Analytical Laboratory Report

Lab Sample ID: S62101.06  
Sample Tag: GX24b\_23  
Collected Date/Time: 07/31/2014 16:30  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	165	ug/L	5	SW8260B - SIM	08/01/14 17:07	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.07  
Sample Tag: GX24b\_26  
Collected Date/Time: 07/31/2014 16:35  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	53	ug/L	5	SW8260B - SIM	08/01/14 17:27	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.08  
Sample Tag: GX24b\_29  
Collected Date/Time: 07/31/2014 16:40  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	08/01/14 17:46	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.09  
Sample Tag: GX24b\_69  
Collected Date/Time: 07/31/2014 08:55  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	08/01/14 18:06	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.10  
Sample Tag: GX24b\_73  
Collected Date/Time: 07/31/2014 09:00  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	8	ug/L	5	SW8260B - SIM	08/01/14 18:26	JGH	123-91-1	



# Analytical Laboratory Report

Lab Sample ID: S62101.11  
Sample Tag: GX24b\_76  
Collected Date/Time: 07/31/2014 09:05  
Matrix: Groundwater  
COC Reference: 86289

## Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	None	Yes	9.6	IR

Analysis	Results	Units	RL	Method	Run Date/Time	Analyst	CAS #	Flags
<b>Organics - Volatiles</b>								
1,4-Dioxane	Not detected	ug/L	5	SW8260B - SIM	08/01/14 18:46	JGH	123-91-1	





**Appendix F**

EVS Volumetric Data

## Appendix F

### Volumetric Estimate - Lower 1,4-Dioxane Source Area and Plume RACER Lansing - Plants 2, 3 6, Lansing, Michigan

#### Soil - Perched 1,4-Dioxane

Geologic Layers: All

Computations for 1,4-Dioxane

Isovolume Level = 1.5000E+001 ug/kg (ppb)	15
Total Soil Volume = 4.1267E+004 Cubic Feet	41,267
Total Soil Mass = 2.4745E+006 Kilograms	2,474,500
Chemical Volume = 9.3776E-003 Cubic Feet	0.009
Chemical Mass = 2.7448E-001 Kilograms	<b>0.3</b>
Average 1,4-Dioxane = 1.1093E+002 ug/kg (ppb)	111

#### Groundwater - Source Area - Deep Overburden 1,4-Dioxane (as equivalent groundwater)

Geologic Layers: All

Computations for 1,4-Dioxane

Isovolume Level = 8.5000E+000 ug/liter (ppb)	8.5
Total Soil Volume = 7.2321E+005 Cubic Feet	723,210
Total Soil Mass = 3.6231E+007 Kilograms	36,231,000
Chemical Volume = 2.0695E-002 Cubic Feet	0.021
Chemical Mass = 6.0574E-001 Kilograms	<b>0.6</b>
Water Volume = 2.6036E+005 Cubic Feet	260,360
Water Mass = 7.3722E+006 Kilograms	7,372,200
Average 1,4-Dioxane = 8.2165E+001 ug/liter (ppb)	82.2

#### Groundwater - Sitewide (Plants 2 & 3) Lower 1,4-Dioxane Plume

Geologic Layers: All

Computations for 1,4-Dioxane

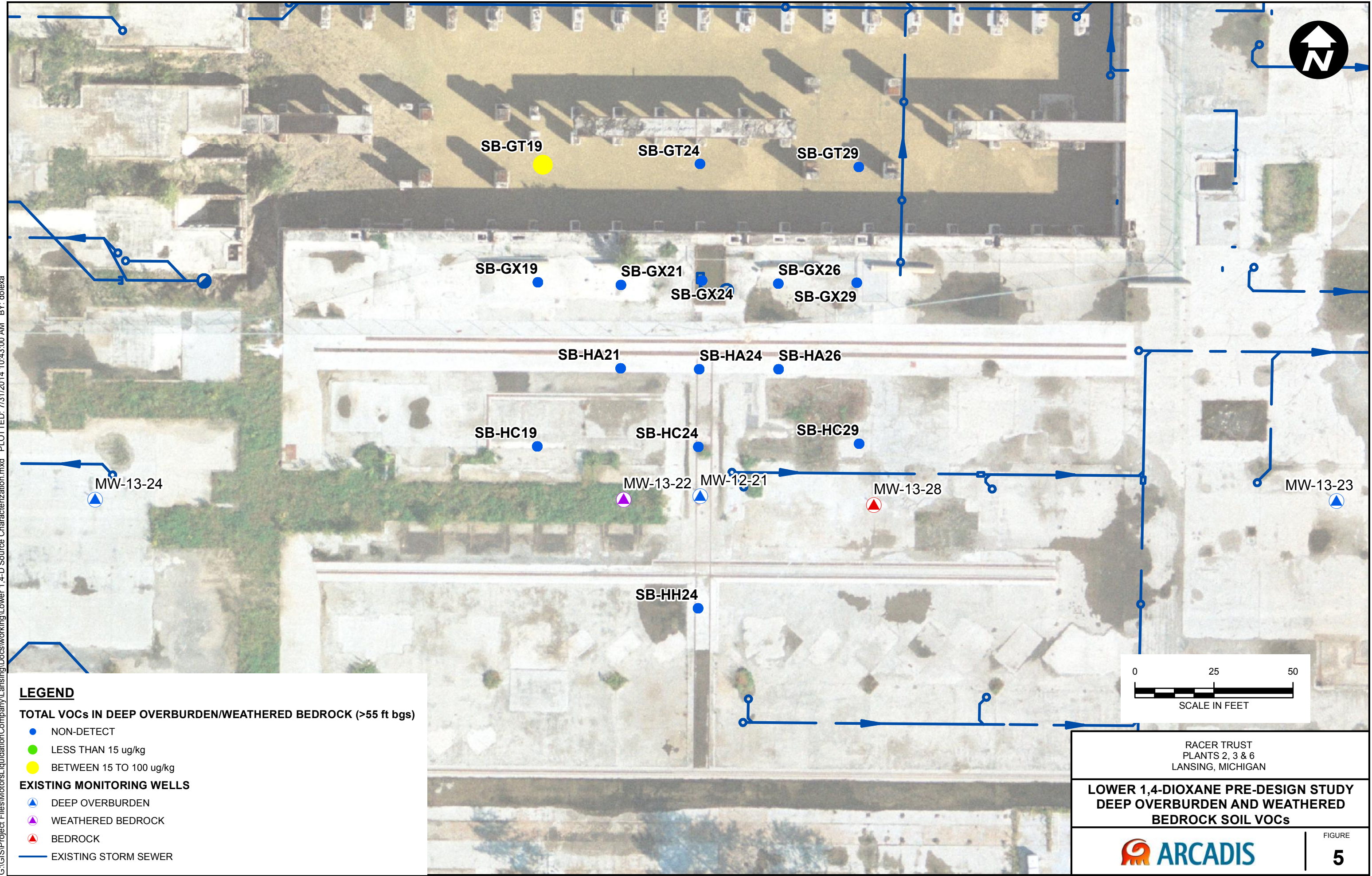
Isovolume Level = 8.5000E+000 ug/liter (ppb)	8.5
Total Soil Volume = 5.8551E+007 Cubic Feet	58,551,000
Total Soil Mass = 2.9333E+009 Kilograms	2,933,300,000
Chemical Volume = 7.4802E-001 Cubic Feet	0.748
Chemical Mass = 2.1895E+001 Kilograms	<b>21.9</b>
Water Volume = 2.1078E+007 Cubic Feet	21,078,000
Water Mass = 5.9685E+008 Kilograms	596,850,000
Average 1,4-Dioxane = 3.6683E+001 ug/liter (ppb)	36.7



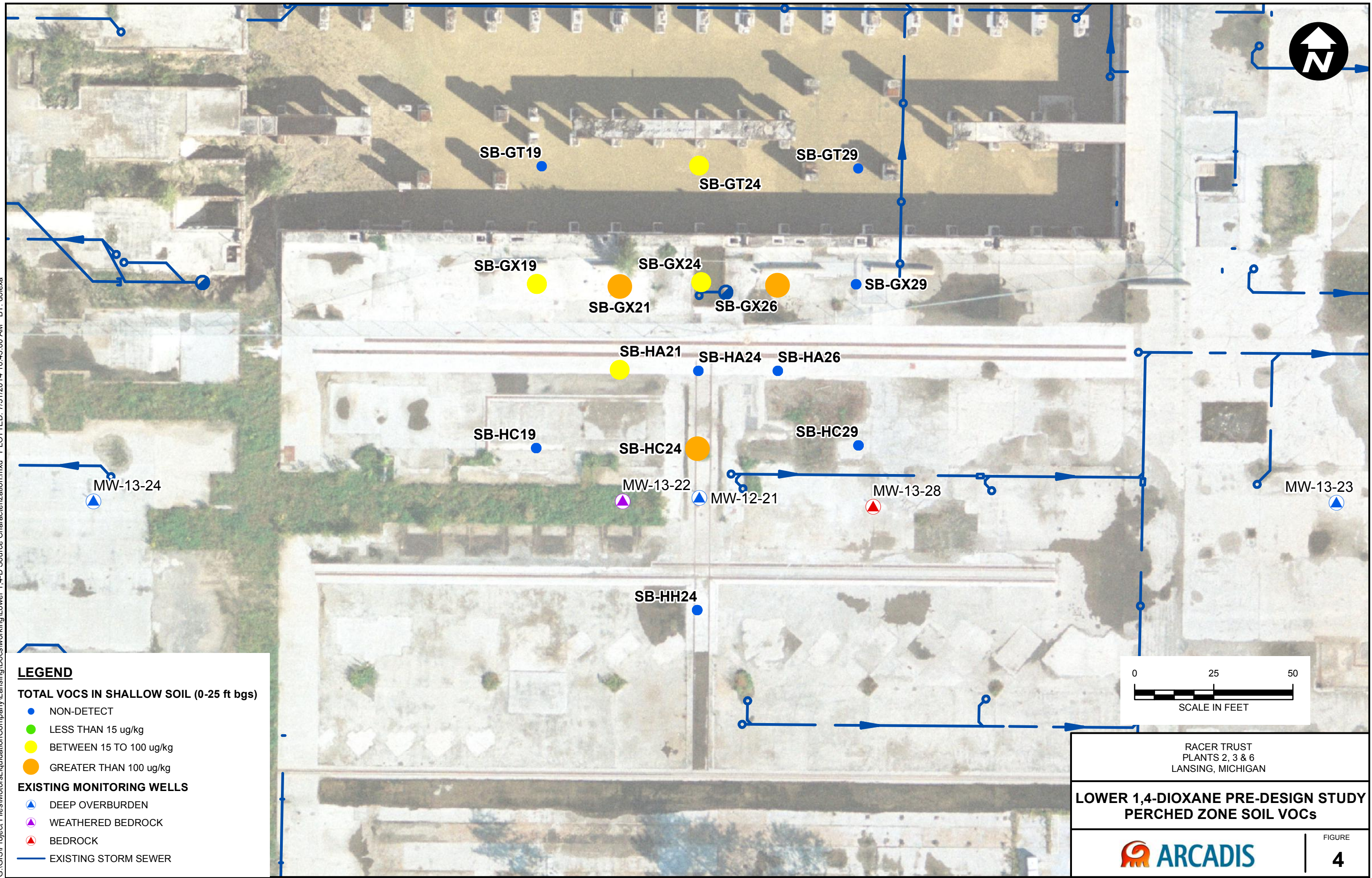
## **Appendix G**

VOC Distribution Maps

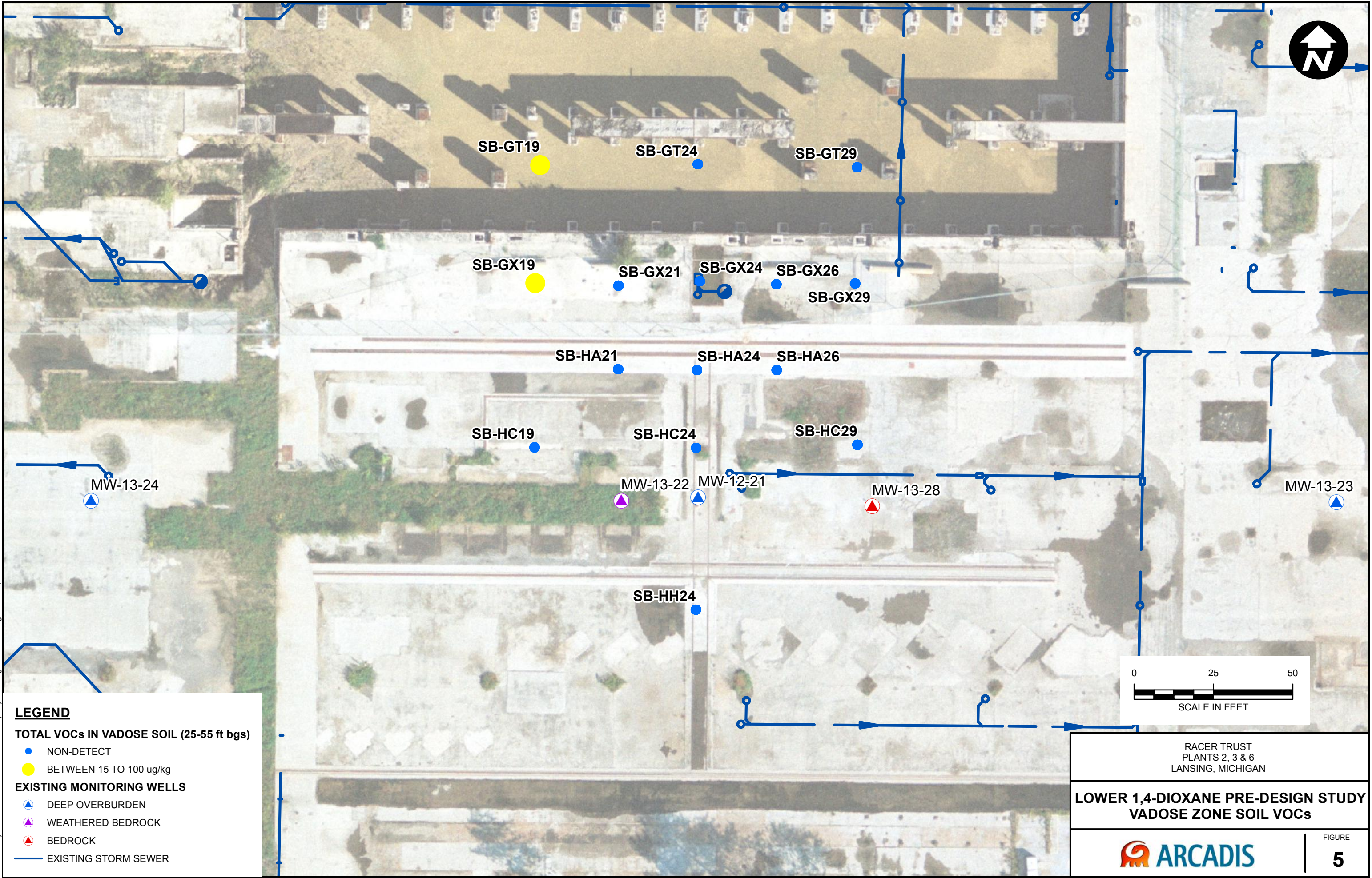
CITY: Novi; DIV: ENV; DB: TRY; PIC: PM; TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
G:\GIS\Project Files\MotorsLiquidation\Company\ Lansing\Docs\working\Lower 1,4-D Source Characterization.mxd PLOTTED: 7/31/2014 10:43:00 AM BY: dolexa



CITY: Novi; DIV: ENV; DB: TRY; PIC: PM; TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
G:\GIS\Project Files\MotorsLiqudationCompany\Lansing\Docs\working\Lower 1,4-D Source Characterization.mxd PLOTTED: 7/31/2014 10:43:00 AM BY: dolexa



CITY: Novi; DIV: ENV; DB: TRY; PIC: PM; TR: PROJECT NUMBER: COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl  
G:\GIS\Project Files\MotorsLiqu道ation\Company\ Lansing\Docs\working\Lower 1,4-D Source Characterization.mxd PLOTTED: 7/31/2014 10:43:00 AM BY: dolexa



**LEGEND**

**TOTAL VOCs IN VADOSE SOIL (25-55 ft bgs)**

- NON-DETECT
- BETWEEN 15 TO 100 ug/kg

**EXISTING MONITORING WELLS**

- ▲ DEEP OVERBURDEN
- ▲ WEATHERED BEDROCK
- ▲ BEDROCK
- EXISTING STORM SEWER



RACER TRUST  
PLANTS 2, 3 & 6  
LANSING, MICHIGAN

**LOWER 1,4-DIOXANE PRE-DESIGN STUDY  
VADOSE ZONE SOIL VOCs**



FIGURE

**5**



## **Appendix H**

Materials Testing Consultants  
Geotechnical Laboratory Report



August 12, 2014  
Project No. 141244

Jesse Wright  
Arcadis U.S., Inc  
132 East Washington Street  
Suite 600  
Indianapolis, IN 46204

Reference: RACER Lansing  
Geotechnical Testing

Dear Mr. Wright:

Materials Testing Consultants, Inc. performed geotechnical testing on four samples retrieved from the referenced project. The following tests were performed:

Laboratory Determined Density, ASTM D7263  
Moisture Content, ASTM D2216  
Specific Gravity, ASTM D854  
Hydraulic Conductivity by Flex-Wall Permeameter, ASTM D5084  
Permeability of Granular Soils (Constant Head), ASTM D2434

Completed test Index Test results are shown in the two table of Index Test Results below. Test reports for Hydraulic Conductivity and Particle Size Analysis are attached.

Specimen Number	Location	Depth (ft)	Moisture	Dry Density (lb/ft <sup>3</sup> )	Specific Gravity	Void Ratio	Porosity
105435	SB-GX24b	10-12	9.8%	131.5	2.79	0.33	0.25
105436	SB-GX24b	20-22	11.1%	132.9	2.76	0.30	0.23
105437	SB-GX24b	70-72	17.6%	116.5	2.77	0.48	0.33
105438	SB-GX24b	90-92	13.8%	104.4	2.74	0.64	0.39

Specimen Number	Location	Depth (ft)	USCS Classification	Hydraulic Conductivity, (cm/sec)
105435	SB-GX24b	10-12	CL	2.01 x 10 <sup>-6</sup>
105436	SB-GX24b	20-22	CL	3.60 x 10 <sup>-8</sup>
105437	SB-GX24b	70-72	CL	4.08 x 10 <sup>-5</sup>
105438	SB-GX24b	90-92	ML	5.16 x 10 <sup>-5</sup>

**Materials Testing Consultants, INC.**

Arcadis U.S., Inc.  
Project No. 141271  
September 12, 2014

Should you have any questions or require additional assistance, please contact me at your earliest convenience.

Sincerely,

**MATERIALS TESTING CONSULTANTS, INC.**



Timothy J. Lautenbach, P.E.  
Laboratory Manager

Attachments:

Report of Hydraulic Conductivity, ASTM D5084  
Report of Permeability of Granular Soils (Constant Head), ASTM D2434



PROJECT RACER Lansing  
CLIENT Arcadis U.S., Inc.  
CONTRACTOR \_\_\_\_\_  
ENGINEER/ARCHITECT \_\_\_\_\_

**MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D 5084**

MTC SAMPLE NO.: 105436 TEST DATE: 8-20-2014  
SAMPLE LOCATION: SB-GX24b Depth - 10-12 ft SAMPLE CONDITION: Undisturbed  
SAMPLE DESCRIPTION: Grey Lean Clay  
TYPE OF SAMPLE: Undisturbed Shelby Tube Sample

SAMPLE DIMENSIONS - INITIAL

DIAMETER (IN): 2.79 HEIGHT (IN): 2.46 AREA (SQ IN): 6.10  
DRY UNIT WEIGHT (PCF): 131.6 WATER CONTENT (%): 9.8

TYPE OF PERMEANT: De-Aired Water  
MAXIMUM BACK PRESSURE USED (PSI): 50.0 psi  
MAXIMUM EFFECTIVE CONSOLIDATION STRESS: 6.0 psi  
MINIMUM EFFECTIVE CONSOLIDATION STRESS: 1.0 psi  
RANGE OF HYDRAULIC GRADIENT: 78.5-83.8

SAMPLE DIMENSIONS - FINAL

DIAMETER (IN): 2.75 HEIGHT (IN): 2.41 AREA (SQ IN): 5.95  
DRY UNIT WEIGHT (PCF): 137.2 WATER CONTENT (%): 11.1 SATURATION: 105%

AVERAGE HYDRAULIC CONDUCTIVITY (CM/SEC): 2.01 x10<sup>-6</sup>

REMARKS: \*Specific Gravity Measured at 2.79

REPORT BY: T. Lautenbach

REVIEWED BY: 



PROJECT RACER Lansing  
CLIENT Arcadis U.S., Inc.  
CONTRACTOR \_\_\_\_\_  
ENGINEER/ARCHITECT \_\_\_\_\_

**MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D 5084**

MTC SAMPLE NO.: 105436 TEST DATE: 8-20-2014  
SAMPLE LOCATION: SB-GX24b Depth – 20-22 ft SAMPLE CONDITION: Undisturbed  
SAMPLE DESCRIPTION: Grey Lean Clay  
TYPE OF SAMPLE: Undisturbed Shelby Tube Sample

SAMPLE DIMENSIONS - INITIAL

DIAMETER (IN): 2.77 HEIGHT (IN): 3.03 AREA (SQ IN): 6.02  
DRY UNIT WEIGHT (PCF): 132.9 WATER CONTENT (%): 11.1

TYPE OF PERMEANT: De-Aired Water  
MAXIMUM BACK PRESSURE USED (PSI): 50.0 psi  
MAXIMUM EFFECTIVE CONSOLIDATION STRESS: 12.0 psi  
MINIMUM EFFECTIVE CONSOLIDATION STRESS: 1.0 psi  
RANGE OF HYDRAULIC GRADIENT: 299.8-301.2

SAMPLE DIMENSIONS - FINAL

DIAMETER (IN): 2.75 HEIGHT (IN): 3.02 AREA (SQ IN): 5.95  
DRY UNIT WEIGHT (PCF): 133.8 WATER CONTENT (%): 10.7 SATURATION: 102%

AVERAGE HYDRAULIC CONDUCTIVITY (CM/SEC): 3.60 x10<sup>-8</sup>

REMARKS: \*Specific Gravity Measured at 2.76

REPORT BY: T. Lautenbach

REVIEWED BY: 



PROJECT RACER Lansing  
CLIENT Arcadis U.S., Inc.  
CONTRACTOR \_\_\_\_\_  
ENGINEER/ARCHITECT \_\_\_\_\_

**MEASUREMENT OF HYDRAULIC CONDUCTIVITY OF SATURATED POROUS MATERIALS USING A FLEXIBLE WALL PERMEAMETER ASTM D 5084**

MTC SAMPLE NO.: 105437 TEST DATE: 8-11-2014  
SAMPLE LOCATION: SB-GX24b Depth – 70-72 ft SAMPLE CONDITION: Undisturbed  
SAMPLE DESCRIPTION: Grey Lean Clay  
TYPE OF SAMPLE: Undisturbed Shelby Tube Sample

SAMPLE DIMENSIONS - INITIAL

DIAMETER (IN): 2.75 HEIGHT (IN): 2.58 AREA (SQ IN): 5.94  
DRY UNIT WEIGHT (PCF): 116.6 WATER CONTENT (%): 17.6

TYPE OF PERMEANT: De-Aired Water  
MAXIMUM BACK PRESSURE USED (PSI): 50.0 psi  
MAXIMUM EFFECTIVE CONSOLIDATION STRESS: 36.0.0 psi  
MINIMUM EFFECTIVE CONSOLIDATION STRESS: 1.0 psi  
RANGE OF HYDRAULIC GRADIENT: 30.15-44.42

SAMPLE DIMENSIONS - FINAL

DIAMETER (IN): 2.78 HEIGHT (IN): 2.55 AREA (SQ IN): 6.05  
DRY UNIT WEIGHT (PCF): 112.3 WATER CONTENT (%): 18.7 SATURATION: 96%

AVERAGE HYDRAULIC CONDUCTIVITY (CM/SEC): 4.08 x10<sup>-5</sup>

REMARKS: \*Specific Gravity Measured at 2.77

REPORT BY: T. Lautenbach

REVIEWED BY: 



PROJECT RACER Lansing  
 CLIENT Arcadis U.S., Inc.  
 CONTRACTOR \_\_\_\_\_  
 ENGINEER/ARCHITECT \_\_\_\_\_

**PERMEABILITY TEST ON GRANULAR SOIL ASTM D 2434**

MTC SAMPLE NO.: 105438 TEST DATE: 8-11-2014  
 SAMPLE LOCATION: SB GX24b Depth 90-92 ft SAMPLE DATE: 7-31-2014  
 DESCRIPTION OF SOIL: Gray Silt USCS CLASSIFICATION: ML  
 SAMPLE CONDITION: As-Received Moisture PERMEANT: De-aired Tap Water  
 SAMPLE DIAMETER (cm): 7.60 SOIL WEIGHT (g): 446.6  
 SAMPLE AREA (cm<sup>2</sup>): 45.39 SOIL HEIGHT (cm): 5.17  
 DRY UNIT WEIGHT (PCF): 104.4 VOID RATIO: 0.6352  
 OVERSIZE PARTICLES (%): NA SPECIFIC GRAVITY (D854): 2.74

**TEST DATA**

TEST NUMBER	MANOMETERS, mm		HEAD H, (CM)	QUANTITY Q, (CM <sup>3</sup> )	TIME T, (SEC)	VELOCITY Q/At	HYDRAULIC GRADIENT H/L	TEMP (°C)	COEFFICIENT OF PERMEABILITY (CM/SEC)
	H <sub>1</sub>	H <sub>2</sub>							
1	163.7	15.9	147.8	45.5	600	0.00167	28.59	21.6	5.62 x 10 <sup>-5</sup>
2	166.4	15.9	150.5	45.6	600	0.00167	29.12	21.7	5.52 x 10 <sup>-5</sup>
3	171.3	15.9	155.4	45.2	600	0.00166	30.07	21.8	5.29 x 10 <sup>-5</sup>
4	173.8	15.9	158.0	47.1	624	0.00166	30.56	21.9	5.19 x 10 <sup>-5</sup>
5	176.2	15.9	160.4	45.4	600	0.00167	31.02	22.4	5.08 x 10 <sup>-5</sup>
6	178.9	15.9	163.0	45.7	600	0.00168	31.54	22.0	5.07 x 10 <sup>-5</sup>
7									
8									

AVERAGE: 5.16 x 10<sup>-5</sup> cm/sec

REMARKS: Average Coefficient of Permeability (Hydraulic Conductivity) is taken from tests 3 through 6 selected by charting the Velocity vs. Hydraulic Gradient data.

REPORT BY: T. Lautenbach

REVIEWED BY: 