

TO
Christine Matlock, EGLE

DATE
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FROM
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PROJECT NUMBER
30171056

SUBJECT
MW-16-79 Abandonment Plan
RACER Trust Lansing, Plant 2

DEPARTMENT
Resilience

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Well MW-16-79 is a weathered bedrock well that has been used as a sentinel well for 1,4-dioxane monitoring southeast of the Lower 1,4-Dioxane Plume. The location of MW-16-79 and surrounding borings is provided as **Figure 1**. The well is screened 68-73 feet below ground surface (ft bgs) in weathered sandstone. The top of the sandstone is noted at 62 ft bgs at this location and the overlying sediment is dominated by silt and clay. Boring logs are included as **Attachment 1**. During the November 1, 2022, gauging event a thin layer, or sheen, of light non-aqueous phase liquid (LNAPL) (i.e., <0.1 ft thick) was detected in the well and confirmed with a bailer. The LNAPL was bailed out of the well and adsorbent sock was placed in the well for a period of two weeks. The sock was removed on November 15th and had minimal LNAPL staining. Follow-up gauging was also completed on December 5th and did not identify the presence of LNAPL.

Well MW-16-79 was installed in 2016 as a sentinel well for 1,4-dioxane monitoring southeast of the Lower 1,4-Dioxane Plume. Since then, it has been sampled 16 times. A summary of the analytical results for MW-16-79 is included as **Table 1**. During the 16 sample events, 1,4-dioxane was detected once at a concentration of 2 µg/L in December 2019. The well has also been periodically sampled for volatile organic compounds (VOCs) and results were all non-detect except for acetone (14 µg/L) following installation in 2016. Semi volatile organic compounds (SVOCs) were sampled after installation in 2016 and were also non-detect.

Following the detection of the LNAPL, LNAPL sampling was attempted but the volume removed was not sufficient to submit for laboratory analysis. After removal of the LNAPL, a groundwater sample was collected on November 2, 2022, and submitted to Merit Laboratories in Lansing for analysis of VOCs, SVOCs and 1,4-dioxane. The results of the sampling indicate the groundwater was non-detect for VOCs and 1,4-dioxane and had low concentrations of SVOCs, including chrysene (9 µg/L), phenanthrene (9 µg/L) and pyrene (5 µg/L). The Laboratory analytical report is included as **Attachment 2**.

There were six borings completed in the vicinity of well MW-16-79 during the 2011-2012 RCRA Facility Investigation (RFI) activities. Boring P2-SB-02 was completed as part of the “miscellaneous gap filler” borings during the 2011 Phase 1 RFI activities. Step-outs around P2-SB-02 were completed during the 2012 Phase 2 RFI activities. These borings are shown on **Figure 1**. Soil sample results for these locations are summarized on **Table 2**. Review of **Table 2** shows that VOCs, including tetrachloroethene (PCE), were detected at boring P2-SB-02. Several SVOCs were also detected in the area at low concentrations including fluoranthene, fluorene,

naphthalene, phenanthrene and pyrene; compounds common with oil and grease impacts. Further, review of the boring logs (**Attachment 1**) shows that at several of the boring locations (SB-A5.3-OR159, SB-A5.3-OV154 SB-A5.3-OV163, and VAP-A5.3-OV159) odors and/or staining, smearing or other traces of residual oils were observed in the area. Well MW-16-79 was installed at grid location OR159 with odors noted (but no other indications of LNAPL) observed in the clay noted between 2 and 17 ft bgs.

Based on the data collected around well MW-16-79, there appears to be intermittent residual LNAPL present in shallow soils the area. The most likely explanations for the LNAPL present in MW-16-79 are:

- 1) Migration of LNAPL down around the outside of the well casing through the grout (i.e., leaking seal) into the well screen.
- 2) Perched groundwater and LNAPL entering the well through a shallow break in the PVC casing, or casing joint, thereby allowing shallow water/LNAPL to enter the casing and accumulate at the water surface in the well.

The well screen for MW-16-79 is installed at 68 to 73 ft bgs, or 794.07 to 789.07 feet above mean sea level (ft msl), in weathered sandstone. The groundwater potentiometric surface at MW-16-79 has been rising since 2016 with the groundwater potentiometric surface noted above the top of the well screen since April 2017. In 2022, groundwater elevation measured in the well in was 801.98 ft msl in May and 799.16 ft msl in November. This data suggests it is unlikely that the LNAPL migrates down around the well casing, as it would need to sink through a water column to get to the well screen. Therefore, the most feasible explanation is LNAPL entry into the well through a loose joint or crack in the well casing. Another possibility is the LNAPL was dragged down during installation to the screen interval during installation and was not detected until 2022. The analytical results do not seem to support this theory and it is unlikely that LNAPL would have gone unnoticed over the course of 16 sampling events.

Based on discussion with EGLE during our quarterly meeting on December 16, 2022, and follow-up discussion on January 27, 2023, we are proposing to abandon MW-16-79 to eliminate any potential pathway that may be present from the perched aquifer to the deeper weathered bedrock. RACER proposes the following approach for well abandonment:

- An absorbent sock will be placed in MW-16-79 to remove any additional LNAPL the week of February 6, 2023. Prior to abandonment, the sock will be removed, and the well will be gauged with an interface probe. If LNAPL is present the LNAPL will be removed with a bailer prior to abandonment.
- The MW-16-79 well casing will be pressure grouted from the bottom up with a thick bentonite grout to a depth of approximately 10 feet bgs and allowed to setup for 24 hours.
- Once the grout has setup, the upper portion of MW-16-79 will be over drilled using a 10-inch sonic casing to a depth at least 2-feet into the underlying glacial till (~20-25 feet bgs). The upper portion of MW-16-79 will then be removed from the borehole.
- Once the casing is removed, the borehole extending into the clay till will be abandoned with neat cement mixed with 5-10% bentonite to reduce the potential for shrinkage of the concrete and will be added from the bottom up using a tremie line to seal the borehole (~0-25 feet bgs).
- The borehole will be patched with cement to bring it up to grade with the surrounding slab.

Based on the available analytical results for samples from this well, there is no indication that any significant contamination has made it into the weathered bedrock groundwater at this location. However, to further evaluate these results, additional sampling will be completed downgradient during the first quarter 2023 groundwater

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monitoring event. Wells MW-16-78 and MW-21-140 will be sampled during the first quarter 2023 for analysis of VOCs, 1,4-dioxane, SVOCs and PFAS. Further, MW-16-78 and MW-21-140 will be added to the 2023 revised Interim Groundwater Monitoring Plan (currently in review) for annual sampling of VOCs, 1,4-dioxane, SVOCs and PFAS.

Abandonment of well MW-16-79 will occur after EGLE approval and pending driller availability. Activities completed pursuant to this plan will be documented in a brief report and submitted to EGLE.

Enclosures:

Figure 1 – MW-16-79 Area

Table 1 – MW-16-79 Historical Analytical Results

Table 2 – Area 5-3 Historical Soil Analytical Results

Attachment 1 – Area 5-3 Soil Boring Logs

Attachment 2 – Laboratory Analytical Reports

Figures

Tables

Table 1: MW-16-79 Historical Analytical Results
 RACER Trust Lansing
 Lansing, Michigan



Location ID:	P201	P201		MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79
Date Collected:	Residential	Groundwater		09/21/16	12/20/16	04/26/17	12/05/17	05/08/18	12/11/18	06/04/19	12/04/19	06/09/20	12/07/20	03/03/21	06/03/21	08/31/21	12/02/21	06/02/22	11/02/22	
Sample Name:	Drinking Water	Surface Water	Units	MW-16-79_092316	MW-16-79_122016	MW-16-79_042617	MW-16-79_120517	MW-16-79_050818	MW-16-79_121118	MW-16-79_060419	MW-16-79_120419	MW-16-79_060920	MW-16-79_120720	MW-16-79_030321	MW-16-79_060321	MW-16-79_083121	MW-16-79_120221	MW-16-79_060222	MW-16-79_110222	
Field																				
Conductance, specific	--	--	mS/cm	771	NA	890	1,011	NA	NA	1.1	1.18	0.94	0.82	0.67	0.99	1.13	1.03	0.97	NA	NA
Dissolved oxygen (DO)	--	--	mg/L	0.68	NA	0.94	2.54	NA	NA	0.86	1.1	0.79	0.34	0.2	0.75	0.64	0.42	0.71	NA	NA
Oxidation reduction potential (ORP), field	--	--	millivolts	-125.20	NA	-99	-8.8	NA	NA	51.5	-64.8	-70.9	-78.8	-42.1	-80.9	-114.6	-71	-73.4	NA	NA
pH	6.5 to 8.5	6.5 to 9.0	s.u.	7.39	NA	7.26	7.08	NA	NA	7.12	7.24	7.14	7.24	7.15	6.91	7.16	7.02	7.14	NA	NA
Temperature, field	--	--	Deg C	19.18	NA	19.4	9.16	NA	NA	20	10.2	19.2	11	12.3	23.8	30.1	12.5	15.7	NA	NA
Turbidity (field)	--	--	NTU	185	NA	546	106	NA	NA	20.3	25.5	50.7	7.76	1.18	20.1	32.6	24.1	84.5	NA	NA
Volatile Organics (via EPA Method SW5030C/8260C)																				
1,1,1,2-Tetrachloroethane	77	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,1,1-Trichloroethane	200	89	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,1,2,2-Tetrachloroethane	8.5	78	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,1,2-Trichloroethane	5.0	330	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,1-Dichloroethane	880	740	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,1-Dichloroethene	7.0	130	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2,3-Trichlorobenzene	--	--	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
1,2,3-Trichloropropane	42	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2,3-Trimethylbenzene	--	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2,4-Trichlorobenzene	70	99	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
1,2,4-Trimethylbenzene	63	17	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dibromo-3-chloropropane (DBCP)	0.2	--	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
1,2-Dibromoethane (Ethylene dibromide)	0.05	5.7	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dichlorobenzene	600	13	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dichloroethane	5.0	360	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,2-Dichloropropane	5.0	230	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,3,5-Trimethylbenzene	72	45	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,3-Dichlorobenzene	6.6	28	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,4-Dichlorobenzene	75	17	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
1,4-Dioxane	7.2	280	ug/L	<3	<3	<3	<3	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
2-Butanone (Methyl ethyl ketone) (MEK)	13,000	2,200	ug/L	<10	NA	<10	NA	NA	NA	<25	NA	NA	NA	NA	NA	NA	NA	NA	NA	<25
2-Hexanone	1,000	--	ug/L	<10	NA	<10	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50
2-Methylnaphthalene	260	19	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
2-Phenylbutane (sec-Butylbenzene)	80	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	1,800	--	ug/L	<10	NA	<10	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50
Acetone	730	1,700	ug/L	14	NA	<10	NA	NA	NA	<50	NA	NA	NA	NA	NA	NA	NA	NA	NA	<50
Acrylonitrile	2.6	2	ug/L	NA	NA	NA	NA	NA	NA	<2	NA	NA	NA	NA	NA	NA	NA	NA	NA	<2
Benzene	5.0	200	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Bromobenzene	18	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Bromodichloromethane	80	--	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Bromoform	80	--	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Bromomethane (Methyl bromide)	10	5.0	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Carbon disulfide	800	--	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Carbon tetrachloride	5.0	38	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Chlorobenzene	100	25	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Chlorobromomethane	--	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Chloroethane	430	1,100	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Chloroform (Trichloromethane)	80	350	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Chloromethane (Methyl chloride)	260	--	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
cis-1,2-Dichloroethene	70	620	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
cis-1,3-Dichloropropene	--	--	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Cyclohexane	--	--	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cymene (p-Isopropyltoluene)	--	--	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Dibromochloromethane	80	--	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Dibromomethane	80	--	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Dichlorodifluoromethane (CFC-12)	1,700	--	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Ethyl ether	10	--	ug/L	NA	NA	NA	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	<10
Ethylbenzene	74	18	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Hexachloroethane	7.3	6.7	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Iodomethane	--	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Isopropyl benzene	800	28	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Methyl acetate	--	--	ug/L	<10	NA	<10	NA	NA	NA	<10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl cyclohexane	--	--	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl tert butyl ether (MTBE)	40	7,100	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Methylene chloride	5.0	1,500	ug/L	<1	NA	<1	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
Naphthalene	520	11	ug/L	NA	NA	NA	NA	NA	NA	<5	NA	NA	NA	NA	NA	NA	NA	NA	NA	<5
N-Butylbenzene	80	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
N-Propylbenzene	80	--	ug/L	NA	NA	NA	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
Styrene	100	80	ug/L	<1	NA	<1	NA	NA	NA	<1	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1
tert-Butylbenzene	80</																			

Table 1: MW-16-79 Historical Analytical Results
 RACER Trust Lansing
 Lansing, Michigan



Location ID:	P201	P201		MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79	MW-16-79
Date Collected:	Residential	Groundwater		09/21/16	12/20/16	04/26/17	12/05/17	05/08/18	12/11/18	06/04/19	12/04/19	06/09/20	12/07/20	03/03/21	06/03/21	08/31/21	12/02/21	06/02/22	11/02/22
Sample Name:	Drinking Water	Surface Water	Units	MW-16-79_092316	MW-16-79_122016	MW-16-79_042617	MW-16-79_120517	MW-16-79_050818	MW-16-79_121118	MW-16-79_060419	MW-16-79_120419	MW-16-79_060920	MW-16-79_120720	MW-16-79_030321	MW-16-79_060321	MW-16-79_083121	MW-16-79_120221	MW-16-79_060222	MW-16-79_110222
Inorganics-Filtered (via EPA Method 6020)																			
Antimony (dissolved)	--	--	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arsenic (dissolved)	0.01	0.01	mg/L	<0.002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Barium (dissolved)	--	--	mg/L	0.081	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Boron (Dissolved)	--	--	mg/L	0.19	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium (dissolved)	--	--	mg/L	<0.0005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium (dissolved)	0.1	0.16	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cobalt (dissolved)	--	--	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper (dissolved)	1.0	0.02	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron (dissolved)	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead (dissolved)	0.004	0.044	mg/L	<0.003	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese (dissolved)	--	--	mg/L	0.104 *	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury (dissolved)	--	--	mg/L	<0.0002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel (dissolved)	0.1	0.12	mg/L	0.050 *	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Selenium (dissolved)	--	--	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Silver (dissolved)	--	--	mg/L	<0.0005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Vanadium (dissolved)	0.0045	0.027	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc (dissolved)	--	--	mg/L	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
General Chemistry																			
Nitrate (as N)	10	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phosphorus	63	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total organic carbon (TOC)	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total dissolved solids (TDS)	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total kjeldahl nitrogen (TKN)	--	--	mg/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Per- and Polyfluoroalkyl Substances (PFAS) (via EPA Method 537 Modified)																			
11Cl-PF3OUdS (F-53B Minor)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4:2 FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6:2FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8:2FTS	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9Cl-PF3ONS (F-53B Major)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ADONA	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hexafluoropropylene oxide dimer acid (HFPO-DA) (GenX)	370	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	420	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorobutanoic acid (PFBA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorodecanoic acid (PFDA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorododecanoic acid (PFDoA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanesulfonic Acid (PFHpS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	51	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	400,000	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanesulfonic acid (PFNS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorononanoic acid (PFNA)	6	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane Sulfonamide (PFOSA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctane sulfonic acid (PFOS)	16	12	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorooctanoic acid (PFOA)	8	12,000	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanesulfonic acid (PFPeS)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotetradecanoic acid (PFTeA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluorotridecanoic Acid (PFTriA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Perfluoroundecanoic acid (PFUnA)	--	--	ng/L	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes
 1 concentration above the standard in Column B are shaded gray
 0 concentrations above the standard in Column C are shaded gray

Table 2: Area 5-3 Historical Soil Analytical Results
RACER Trust Plant 2
Lansing, Michigan



Location ID: Sample Depth(ft): Date Collected:	Units	P201 Residential Drinking Water Protection Criteria ^(a)	P201 Groundwater Surface Water Interface Protection Criteria ^(b)	Statewide Default Background Levels ^(c)	P2-SB-02 5 - 6 09/06/11	P2-SB-02 29 - 30 09/07/11	SB-A5.3-OR159 1 - 2 05/30/12	SB-A5.3-OR159 7 - 8 05/30/12	SB-A5.3-OR159 14.5 - 15.5 05/30/12	SB-A5.3-OV154 1.3 - 2 05/30/12	SB-A5.3-OV154 7.5 - 8.5 05/30/12	SB-A5.3-OV154 16 - 17 05/30/12	SB-A5.3-OV163 1.3 - 2 05/30/12	SB-A5.3-OV163 6 - 7 05/30/12	SB-A5.3-OV163 16 - 17 05/30/12	SB-A5.3-PA159 1 - 2 05/31/12	SB-A5.3-PA159 5 - 6 05/31/12	SB-A5.3-PA159 9 - 10 05/31/12	SB-A5.3-PA159 10 - 11 05/31/12
Volatile Organics																			
1,1,1-Trichloroethane	µg/kg	4,000	1,800	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	890 J	240 [330 J]
1,1,2,2-Tetrachloroethane	µg/kg	170	1,600(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,1,2-Trichloroethane	µg/kg	100	6,600(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,1-Dichloroethane	µg/kg	18,000	15,000	--	270	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	1,800 J	1,200 [1,600]
1,1-Dichloroethene	µg/kg	140	2,600	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	400 nd	260 [310] ^a
1,2,4-Trichlorobenzene	µg/kg	4,200	5,900(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2,4-Trimethylbenzene	µg/kg	2,100	570	--	NA	NA	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	10(M)	ID	--	<3	<3 [<3]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	20(M)	110(X)	--	<1	<1 [<1]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2-Dichlorobenzene	µg/kg	14,000	280	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2-Dichloroethane	µg/kg	100	7,200(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,2-Dichloropropane	µg/kg	100	4,600(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,3,5-Trimethylbenzene	µg/kg	1,800	1,100	--	NA	NA	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,3-Dichlorobenzene	µg/kg	170	680	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,4-Dichlorobenzene	µg/kg	1,700	360	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
1,4-Dioxane	µg/kg	1,700	5,600(X)	--	<300	<300 [<300]	<820	<800	<790 [<820]	<880	<780	<770	<760	<780	<820	<790	<810	<860	<770 [<810]
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	2.60E+05	44,000	--	<630	<660 [<690]	<820	<800	<790 [<820]	<880	<780	<770	<760	<780	<820	<790	<810	<860	<770 [<810]
2-Hexanone	µg/kg	20,000	ID	--	<630	<660 [<690]	<820	<800	<790 [<820]	<880	<780	<770	<760	<780	<820	<790	<810	<860	<770 [<810]
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	36,000	ID	--	<630	<660 [<690]	<820 J	<800 J	<790 J [<820 J]	<880 J	<780 J	<770 J	<760 J	<780 J	<820	<790	<810	<860 J	<770 [<810]
Acetone	µg/kg	15,000	34,000	--	<630	<660 [<690]	<2,100	<2,000	<2,000 [<2,100]	<2,200	<1,900	<1,900	<1,900	<2,000	<2,000 J	<2,000	<2,000 J	<2,200	<1,900 [<2,000 J]
Benzene	µg/kg	100	4,000(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Bromodichloromethane	µg/kg	1,600(W)	ID	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Bromoform	µg/kg	1,600(W)	ID	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Bromomethane (Methyl bromide)	µg/kg	200	100	--	<60	<70 [<70]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	µg/kg	16,000	ID	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Carbon tetrachloride	µg/kg	100	760(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	62 J	<77 [<81]
Chlorobenzene	µg/kg	2,000	500	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Chloroethane	µg/kg	8,600	22,000(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Chloroform (Trichloromethane)	µg/kg	1,600(W)	7,000	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Chloromethane (Methyl chloride)	µg/kg	5,200	ID	--	<60	<70 [<70]	<210	<200	<200 [<210]	<220	<190	<190	<190	<200	<200	<200	<200	<220	<190 [<200]
cis-1,2-Dichloroethene	µg/kg	1,400	12,000	--	<60	<70 [<70]	<82	28 J	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
cis-1,3-Dichloropropene	µg/kg	170	180(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Cyclohexane	µg/kg	--	--	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Dibromochloromethane	µg/kg	1,600(W)	ID	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Dichlorodifluoromethane (CFC-12)	µg/kg	95,000	ID	--	<60	<70 [<70]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	µg/kg	1,500	360	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Isopropyl benzene	µg/kg	91,000	3,200	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
m&p-Xylene	µg/kg	5,600	980	--	<100	<100 [<100]	<160	<160	<160 [<160]	<180	<160	<150	<150	<160	<160	<160	<160	<170	<150 [<160]
Methyl acetate	µg/kg	--	--	--	<630	<660 [<690]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl cyclohexane	µg/kg	--	--	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Methyl tert butyl ether (MTBE)	µg/kg	800	1.40E+05(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Methylene chloride	µg/kg	100	30,000(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Naphthalene	µg/kg	35,000	730	--	NA	NA	1,900 ^b	170	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
o-Xylene	µg/kg	5,600	980	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Styrene	µg/kg	2,700	2,100(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Tetrachloroethene	µg/kg	100	1,200(X)	--	660 ^a	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Toluene	µg/kg	16,000	5,400	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
trans-1,2-Dichloroethene	µg/kg	2,000	30,000(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
trans-1,3-Dichloropropene	µg/kg	170	180(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Trichloroethene	µg/kg	100	4,000(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Trichlorofluoromethane (CFC-11)	µg/kg	52,000	NA	--	<60	<70 [<70]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrichloroethane (Freon 113)	µg/kg	5.50E+05(C)	1,700	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77	<76	<78	<82	<79	<81	<86	<77 [<81]
Vinyl chloride	µg/kg	40	260(X)	--	<60	<70 [<70]	<82	<80	<79 [<82]	<88	<78	<77							

Table 2: Area 5-3 Historical Soil Analytical Results
 RACER Trust Plant 2
 Lansing, Michigan



Location ID: Sample Depth(ft): Date Collected:	Units	P201 Residential Drinking Water Protection Criteria ^(a)	P201 Groundwater Surface Water Interface Protection Criteria ^(b)	Statewide Default Background Levels ^(c)	P2-SB-02 5 - 6 09/06/11	P2-SB-02 29 - 30 09/07/11	SB-A5.3-OR159 1 - 2 05/30/12	SB-A5.3-OR159 7 - 8 05/30/12	SB-A5.3-OR159 14.5 - 15.5 05/30/12	SB-A5.3-OV154 1.3 - 2 05/30/12	SB-A5.3-OV154 7.5 - 8.5 05/30/12	SB-A5.3-OV154 16 - 17 05/30/12	SB-A5.3-OV163 1.3 - 2 05/30/12	SB-A5.3-OV163 6 - 7 05/30/12	SB-A5.3-OV163 16 - 17 05/30/12	SB-A5.3-PA159 1 - 2 05/31/12	SB-A5.3-PA159 5 - 6 05/31/12	SB-A5.3-PA159 9 - 10 05/31/12	SB-A5.3-PA159 10 - 11 05/31/12
Semi-Volatile Organics																			
1-Methylnaphthalene	µg/kg	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,2'-Oxybis(1-chloropropane) (bis(2-Chloroisopropyl) ether)	µg/kg	--	--	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4,5-Trichlorophenol	µg/kg	39,000	NA	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4,6-Trichlorophenol	µg/kg	2,400	330(M)	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4-Dichlorophenol	µg/kg	1,500	330(M)	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4-Dimethylphenol	µg/kg	7,400	7,600	--	130 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4-Dinitrophenol	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,4-Dinitrotoluene	µg/kg	430	NA	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2,6-Dinitrotoluene	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Chloronaphthalene	µg/kg	6.20E+05	NA	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Chlorophenol	µg/kg	900	360	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Methyl-4,6-dinitrophenol	µg/kg	830(M)	NA	--	<600	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Methylnaphthalene	µg/kg	57,000	4,200	--	570	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Methylphenol	µg/kg	7,400	1,000(M)	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Nitroaniline	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
2-Nitrophenol	µg/kg	400	ID	--	<40 J	<40 J [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
3&4-Methylphenol	µg/kg	7,400	1,000(M)	--	<40	<40 [<40]	<3,000 J	<1,000 J	<4,000 J [$<2,000$ J]	<80	<2,000 J	<70	<800 J	<8,000 J	<70	<100	<800 J	<2,000 J	<70 [<70]
3,3'-Dichlorobenzidine	µg/kg	2,000(M)	2,000(M)	--	<600	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
3-Nitroaniline	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Bromophenyl phenyl ether	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Chloro-3-methylphenol	µg/kg	5,800	280	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Chloroaniline	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Chlorophenyl phenyl ether	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Nitroaniline	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
4-Nitrophenol	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Acenaphthene	µg/kg	3.00E+05	8,700	--	830	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Acenaphthylene	µg/kg	5,900	ID	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Acetophenone	µg/kg	30,000	ID	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Anthracene	µg/kg	41,000	ID	--	750	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Atrazine	µg/kg	60	150	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Benzaldehyde	µg/kg	--	--	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Benzo(a)anthracene	µg/kg	NLL	NLL	--	540 J	<40 [<40]	<1,000 J	1,500 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	260	<400 J	<800 J	<40 [<40]
Benzo(a)pyrene	µg/kg	NLL	NLL	--	<600	<40 [<40]	<1,000 J	1,400 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	220	<400 J	<800 J	<40 [<40]
Benzo(b)fluoranthene	µg/kg	NLL	NLL	--	<600	<40 [<40]	<1,000 J	2,400 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	440 J	<400 J	<800 J	<40 [<40]
Benzo(g,h,i)perylene	µg/kg	NLL	NLL	--	<600	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	160	<400 J	<800 J	<40 [<40]
Benzo(k)fluoranthene	µg/kg	NLL	NLL	--	<600	<40 [<40]	<1,000 J	2,500 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	450 J	<400 J	<800 J	<40 [<40]
Biphenyl (1,1-Biphenyl)	µg/kg	--	--	--	250 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
bis(2-Chloroethoxy)methane	µg/kg	--	--	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
bis(2-Chloroethyl)ether	µg/kg	100	100(M)	--	<40 J	<40 J [<40 J]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
bis(2-Ethylhexyl)phthalate (DEHP)	µg/kg	NLL	NLL	--	<600	<40 [<40]	<3,000 J	<1,000 J	<4,000 J [$<2,000$ J]	<80	<2,000 J	<70	<800 J	<8,000 J	<70	<100	<800 J	<2,000 J	<70 [<70]
Butyl benzylphthalate (BBP)	µg/kg	2.20E+06(C)	1.20E+05(X)	--	<600	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Caprolactam	µg/kg	1.20E+05	NA	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Carbazole	µg/kg	9,400	1,100	--	<40	<40 [<40]	<1,000 J	<600 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	<70	<400 J	<800 J	<40 [<40]
Chrysene	µg/kg	NLL	NLL	--	1,990 J	<80 [<80]	2,000 J	1,700 J	<2,000 J [$<1,000$ J]	<40	<1,000 J	<40	<400 J	<4,000 J	<40	280	<400 J	<800 J	<40 [<40]
Dibenz(a,h)anthracene	µg/kg	NLL	NLL	--	<80 I	<80 [<80]	<3,000 J	<1,000 J	<4,000 J [$<2,000$ J]										

Table 2: Area 5-3 Historical Soil Analytical Results
 RACER Trust Plant 2
 Lansing, Michigan



Location ID: Sample Depth(ft): Date Collected:	Units	P201 Residential Drinking Water Protection Criteria ^(a)	P201 Groundwater Surface Water Interface Protection Criteria ^(b)	Statewide Default Background Levels ^(c)	P2-SB-02 5 - 6 09/06/11	P2-SB-02 29 - 30 09/07/11	SB-A5.3-OR159 1 - 2 05/30/12	SB-A5.3-OR159 7 - 8 05/30/12	SB-A5.3-OR159 14.5 - 15.5 05/30/12	SB-A5.3-OV154 1.3 - 2 05/30/12	SB-A5.3-OV154 7.5 - 8.5 05/30/12	SB-A5.3-OV154 16 - 17 05/30/12	SB-A5.3-OV163 1.3 - 2 05/30/12	SB-A5.3-OV163 6 - 7 05/30/12	SB-A5.3-OV163 16 - 17 05/30/12	SB-A5.3-PA159 1 - 2 05/31/12	SB-A5.3-PA159 5 - 6 05/31/12	SB-A5.3-PA159 9 - 10 05/31/12	SB-A5.3-PA159 10 - 11 05/31/12
PCBs																			
Aroclor-1016 (PCB-1016)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221 (PCB-1221)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232 (PCB-1232)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242 (PCB-1242)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248 (PCB-1248)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254 (PCB-1254)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260 (PCB-1260)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Metals																			
Antimony	mg/kg	4.3	94(X)	--	<0.12	<0.13 [<0.13]	<0.20	<0.22	<0.21 [<0.21]	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.21	<0.20	<0.20 [<0.2]
Arsenic	mg/kg	4.6	4.6	5.8	0.87	3.15 [3.1]	0.55	0.58	1.15 [1.47]	0.63	0.82	1.40	2.71	1.39	2.72	0.86	2.12	0.87	0.57 [0.57]
Barium	mg/kg	1,300	(G)	75	49.3	37.2 [40]	14.0	59.9	17.0 [21.5]	91.2^l	30.7	30.7	32.5	6.06	19.3	66.0	60.9	28.8	35.5 [35.3]
Beryllium	mg/kg	51	(G)	--	0.23	0.20 [0.16]	<0.20	0.34	<0.21 [<0.21]	0.96	<0.20	0.22	0.23	<0.20	<0.20	0.40	0.25	<0.20	<0.20 [<0.2]
Boron	mg/kg	10	140(X)	--	<4.92	<5.14 [<5.06]	<4.1	<4.4	<4.2 [<4.2]	<4.2	<4.0	<4.0	7.05	<4.1	<4.1	<4.0	<4.2	<4.0	<4.0 [<4.1]
Cadmium	mg/kg	6	(G,X)	1.2	0.18	<0.13 [<0.13]	<0.10	0.29	<0.10 [<0.1]	0.18	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10 [<0.1]
Chromium III	mg/kg	1.00E+06(D)	(G,X)	18	4.02	3.54 [4.05]	3.08	7.57	3.16 [5.12]	9.34	7.13	6.33	9.72	2.62	3.75	10.3	10.1	5.68	6.19 [5.75]
Cobalt	mg/kg	0.8	2	6.8	3.37	3.40 [3.36]	10.6^{abi}	3.98	2.28 [2.81]	7.62^{abi}	2.60	3.74	28.3^{abi}	1.86	3.01	7.81^{abi}	7.88^{abi}	5.15	2.97 [2.69]
Copper	mg/kg	5,800	(G)	32	7.83	10.0 [10.2]	4.02	12.1	5.42 [7.66]	4.66	7.59	9.04	13.1	4.23	6.15	6.33	11.3	9.10	8.51 [7.31]
Lead	mg/kg	700	(G,X)	21	4.47	5.72 [5.9]	3.91	12.2	3.47 [3.51]	9.49	3.60	4.17	6.03	2.13	3.34	8.73	6.81	4.19	1.96 [1.84]
Manganese	mg/kg	1	(G,X)	440	267	250 [268]	99.6	148	173 [198]	256	187	220	264	113	177	148	343	255	147 [137]
Mercury	mg/kg	1.7	0.05(M)	0.13	0.0124	0.0102 [0.0113]	0.0078	0.0385	<0.0057 [<0.0054]	0.0531	0.0075	0.0091	<0.0058	<0.0058	0.0064	0.0212	0.0182	0.0075	<0.0056 [<0.0057]
Nickel	mg/kg	100	(G)	20	6.94	10.1 [10]	3.66	8.36	6.47 [8.41]	8.47	8.82	10.8	11.9	4.68	8.44	9.13	14.2	10.4	8.35 [6.71]
Selenium	mg/kg	4	0.4	0.41	0.21	0.17 [<0.13]	<0.20 J	<0.22 J	<0.21 J [<0.21 J]	<0.21 J	0.23 J	0.21 J	<0.20 J	<0.20	0.20 J	<0.20	<0.20	<0.20	<0.20 [<0.2]
Silver	mg/kg	4.5	0.1(M)	1	<0.12	<0.13 [<0.13]	1.33^{bi}	<0.11	<0.10 [<0.1]	0.10	<0.10	<0.10	2.42^{bi}	0.13	<0.10	0.70	<0.10	<0.10	<0.10 [<0.1]
Thallium	mg/kg	2.3	4.2(X)	--	<0.12	<0.13 [<0.13]	<0.20	<0.22	<0.21 [<0.21]	<0.21	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.21	<0.20	<0.20 [<0.2]
Vanadium	mg/kg	72	430	--	6.46	5.87 [6.17]	6.28	15.2	5.81 [7.17]	11.0	7.47	9.29	11.3	3.40	6.32	9.95	17.3	10.4	7.40 [6.71]
Zinc	mg/kg	2,400	(G)	47	11.0	16.5 [17.1]	11.3	29.6	13.3 [16.1]	19.7	19.0	16.2	13.0	10.1	14.7	16.7	19.8	17.5	7.49 [7.01]
Miscellaneous																			
Total solids	%	--	--	--	88	85 [84]	79	79	89 [90]	84	90	91	87	86	92	89	87	81	89 [89]

See Notes on Last Page.

Table 2: Area 5-3 Historical Soil Analytical Results
 RACER Trust Plant 2
 Lansing, Michigan



Location ID: Sample Depth(ft): Date Collected:	Units	P201 Residential Drinking Water Protection Criteria ^(a)	P201 Groundwater Surface Water Interface Protection Criteria ^(b)	Statewide Default Background Levels ^(c)	VAP-A5.3-OV159* 7 - 8 05/10/12	VAP-A5.3-OV159* 12 - 13 05/10/12	VAP-A5.3-OV159* 17 - 18 05/10/12	VAP-A5.3-OV159* 22 - 23 05/10/12	VAP-A5.3-OV159* 26 - 27 05/10/12	VAP-A5.3-OV159* 31 - 32 05/10/12	VAP-A5.3-OV159* 36 - 37 05/10/12	VAP-A5.3-OV159* 41 - 42 05/10/12	VAP-A5.3-OV159* 46 - 47 05/10/12
Volatile Organics													
1,1,1-Trichloroethane	µg/kg	4,000	1,800	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,1,2,2-Tetrachloroethane	µg/kg	170	1,600(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,1,2-Trichloroethane	µg/kg	100	6,600(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,1-Dichloroethane	µg/kg	18,000	15,000	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,1-Dichloroethene	µg/kg	140	2,600	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2,4-Trichlorobenzene	µg/kg	4,200	5,900(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2,4-Trimethylbenzene	µg/kg	2,100	570	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2-Dibromo-3-chloropropane (DBCP)	µg/kg	10(M)	ID	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2-Dibromoethane (Ethylene dibromide)	µg/kg	20(M)	110(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2-Dichlorobenzene	µg/kg	14,000	280	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2-Dichloroethane	µg/kg	100	7,200(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,2-Dichloropropane	µg/kg	100	4,600(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,3,5-Trimethylbenzene	µg/kg	1,800	1,100	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,3-Dichlorobenzene	µg/kg	170	680	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,4-Dichlorobenzene	µg/kg	1,700	360	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
1,4-Dioxane	µg/kg	1,700	5,600(X)	--	<790	<770	<700	<790	<740	<850	<730 [-730]	<680	<740
2-Butanone (Methyl ethyl ketone) (MEK)	µg/kg	2.60E+05	44,000	--	<790	<770	<700	<790	<740	<850	<730 [-730]	<680	<740
2-Hexanone	µg/kg	20,000	ID	--	<790	<770	<700	<790	<740	<850	<730 [-730]	<680	<740
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	µg/kg	36,000	ID	--	<790	<770	<700	<790	<740	<850	<730 [-730]	<680	<740
Acetone	µg/kg	15,000	34,000	--	<2,000	3,300 JB	2,700 JB	2,100 JB	2,400 JB	2,300 JB	1,800 JB [2,300 JB]	<1,700	<1,900
Benzene	µg/kg	100	4,000(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Bromodichloromethane	µg/kg	1,600(W)	ID	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Bromoform	µg/kg	1,600(W)	ID	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Bromomethane (Methyl bromide)	µg/kg	200	100	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Carbon disulfide	µg/kg	16,000	ID	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Carbon tetrachloride	µg/kg	100	760(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Chlorobenzene	µg/kg	2,000	500	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Chloroethane	µg/kg	8,600	22,000(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Chloroform (Trichloromethane)	µg/kg	1,600(W)	7,000	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Chloromethane (Methyl chloride)	µg/kg	5,200	ID	--	<200	<190	<170	<200	<180	<210	<180 [-180]	<170	<190
cis-1,2-Dichloroethene	µg/kg	1,400	12,000	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
cis-1,3-Dichloropropene	µg/kg	170	180(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Cyclohexane	µg/kg	--	--	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Dibromochloromethane	µg/kg	1,600(W)	ID	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Dichlorodifluoromethane (CFC-12)	µg/kg	95,000	ID	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	µg/kg	1,500	360	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Isopropyl benzene	µg/kg	91,000	3,200	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
m&p-Xylene	µg/kg	5,600	980	--	<160	<150	<140	<160	<150	<170	<150 [-150]	<140	<150
Methyl acetate	µg/kg	--	--	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methyl cyclohexane	µg/kg	--	--	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Methyl tert butyl ether (MTBE)	µg/kg	800	1.40E+05(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Methylene chloride	µg/kg	100	30,000(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Naphthalene	µg/kg	35,000	730	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
o-Xylene	µg/kg	5,600	980	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Styrene	µg/kg	2,700	2,100(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Tetrachloroethene	µg/kg	100	1,200(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Toluene	µg/kg	16,000	5,400	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
trans-1,2-Dichloroethene	µg/kg	2,000	30,000(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
trans-1,3-Dichloropropene	µg/kg	170	180(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Trichloroethene	µg/kg	100	4,000(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Trichlorofluoromethane (CFC-11)	µg/kg	52,000	NA	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Trifluorotrchloroethane (Freon 113)	µg/kg	5.50E+05(C)	1,700	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Vinyl chloride	µg/kg	40	260(X)	--	<79	<77	<70	<79	<74	<85	<73 [-73]	<68	<74
Xylene (total)	µg/kg	5,600	980	--	<239	<227	<210	<239	<224	<255	<223 [-223]	<208	<224

Table 2: Area 5-3 Historical Soil Analytical Results
 RACER Trust Plant 2
 Lansing, Michigan



Location ID: Sample Depth(ft): Date Collected:	Units	P201 Residential Drinking Water Protection Criteria ^(a)	P201 Groundwater Surface Water Interface Protection Criteria ^(b)	Statewide Default Background Levels ⁽ⁱ⁾	VAP-A5.3-OV159* 7 - 8 05/10/12	VAP-A5.3-OV159* 12 - 13 05/10/12	VAP-A5.3-OV159* 17 - 18 05/10/12	VAP-A5.3-OV159* 22 - 23 05/10/12	VAP-A5.3-OV159* 26 - 27 05/10/12	VAP-A5.3-OV159* 31 - 32 05/10/12	VAP-A5.3-OV159* 36 - 37 05/10/12	VAP-A5.3-OV159* 41 - 42 05/10/12	VAP-A5.3-OV159* 46 - 47 05/10/12
PCBs													
Aroclor-1016 (PCB-1016)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1221 (PCB-1221)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1232 (PCB-1232)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1242 (PCB-1242)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1248 (PCB-1248)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1254 (PCB-1254)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aroclor-1260 (PCB-1260)	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total PCBs	µg/kg	NLL	NLL	--	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganics-Metals													
Antimony	mg/kg	4.3	94(X)	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Arsenic	mg/kg	4.6	4.6	5.8	0.87 J	1.05 J	1.94 J	1.96 J	2.44 J	3.15 J	3.41 J [3.38 J]	3.56 J	4.45 J
Barium	mg/kg	1,300	(G)	75	56.3	40.2	23.6	26.4	19.0	20.6	31.4 [31.1]	33.1	58.0
Beryllium	mg/kg	51	(G)	--	0.29	0.22	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.29
Boron	mg/kg	10	140(X)	--	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Cadmium	mg/kg	6	(G,X)	1.2	<0.10 J	<0.10 J	<0.10 J	<0.10 J	<0.10 J	0.21 J	0.54 J [0.14 J]	0.17 J	0.22 J
Chromium III	mg/kg	1.00E+06(D)	(G,X)	18	7.82	6.17	2.72	2.86	2.39	2.56	3.77 [3.59]	3.23	5.58
Cobalt	mg/kg	0.8	2	6.8	4.14	2.75	2.22	2.50	1.97	2.69	3.58 [3.46]	3.75	6.28
Copper	mg/kg	5,800	(G)	32	11.4	9.15	6.46	7.32	6.79	7.71	11.0 [10.3]	9.70	16.7
Lead	mg/kg	700	(G,X)	21	5.67 J	5.12 J	3.33 J	3.63 J	3.68 J	3.95 J	4.82 J [5.51 J]	5.25 J	8.02 J
Manganese	mg/kg	1	(G,X)	440	296	263	208	211	199	244	268 [260]	269	357
Mercury	mg/kg	1.7	0.05(M)	0.13	0.0156	0.0150	0.0083	0.0083	0.0080	0.0078	0.0098 [0.0105]	0.0116	0.0160
Nickel	mg/kg	100	(G)	20	12.6	11.6	7.42	7.78	6.39	8.80	10.6 [10.8]	11.4	18.5
Selenium	mg/kg	4	0.4	0.41	0.31	<0.20	<0.20	<0.20	<0.20	<0.20	0.30 [0.21]	0.20	0.41
Silver	mg/kg	4.5	0.1(M)	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Thallium	mg/kg	2.3	<0.20	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.26
Vanadium	mg/kg	72	430	--	10.6	8.50	4.61	4.78	3.75	4.40	5.85 [5.74]	5.51	8.67
Zinc	mg/kg	2,400	(G)	47	17.1 J	16.4 J	10.0 J	12.1 J	13.9 J	23.1 J	61.6 J [19.5 J]¹	22.1 J	29.5 J
Miscellaneous													
Total solids	%	--	--	--	84	86	90	91	90	90	91 [91]	90	86

See Notes on Last Page.

Table Notes:

Bold fonts represent data where detections were noted above the MDL but below MDEQ Part 201 Generic Cleanup Criteria.

Gray shading indicates result exceeding one or more MDEQ Part 201 Generic Cleanup Criteria and Screening Levels, Dated March 25, 2011.

Data shown in [] represent duplicate sample analytical results.

mg/kg - milligrams per kilogram

µg/kg - micrograms per kilogram

^a - Sample was analyzed in on-site lab with instruments calibrated to screening mode. This data was not validated

^a - Sample exceeds Residential Drinking Water Protection Criteria

^b - Sample exceeds Groundwater Surface Water Interface Protection Criteria

¹ - Sample exceeds Statewide Background Default Levels

EGLE Criteria Footnotes: (as revised September 28, 2012)

-- = Not listed in EGLE Criteria Tables.

ID = Insufficient data to develop a criterion.

NA = Not available.

NLL = Not likely to leach.

NLV = Not likely to volatilize.

C = Value presented is a screening level based on the chemical-specific generic soil saturation concentration (C_{sat}) since the calculated risk-based criterion is greater than C_{sat}.

D = Calculated criterion exceeds 100 percent, hence it is reduced to 100 percent or 1.0E+9 parts per billion (ppb).

G = Groundwater surface water interface (GSI) criterion depends on the pH or water hardness, or both, of the receiving surface water. The final chronic value (FCV) for the protection of aquatic life shall be calculated based on the pH or hardness of the receiving surface water. A hardness value of 257 mg/L was used.

M = Calculated criterion is below the analytical target detection limit, therefore, the criterion defaults to the target detection limit.

W = Concentrations of trihalomethanes in soil shall be added together to determine compliance with the drinking water protection criterion of 1,600 µg/kg.

X = The GSI criterion shown in the generic cleanup criteria tables is not protective for surface water that is used as a drinking water source.

Lab Data Qualifiers:

J = The compound/constituent was positively identified; however, the associated numerical value is an estimated concentration only.

Attachment 1

Area 5-3 Soil Boring Logs

Date Start: 06/13/2016 Date Finish: 06/13/2016 Drilling Company: Cascade Driller's Name: Scott Parkes Drilling Method: Rotosonic Sampling Method: 4X6 Casing Rig Type: Rotosonic Water Level Start (ft. bgs.): Water Level Finish (ft. btoc.):	Northing: NA Easting: NA Casing Elevation: NA Borehole Depth (ft. bgs.): 75.0 Surface Elevation: NA Descriptions By: K. Voet/A. Villhauer	Well/Boring ID: SB-A5.3-OR159/MW-16-79 Client: RACER Location: RACER Lansing Plant 2 Weather Conditions: 60 F, Cloudy
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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'	NA	NA		(0.0 - 2.0') CONCRETE			
5	-5	2	2.0-7.0'	2.0	0.5		(2.0 - 11.5') CLAY, high plasticity, slow dilatancy; moist; soft; black (10YR 2/1). NOTE: Slight odor; debris in concrete and soil; metal grating.			
10	-10	3	7.0-17.0'	10.0	0.5		(11.5 - 17.0') CLAY, medium plasticity, no dilatancy, trace fine sand, trace granules to medium pebbles, subround to round; moist; soft; dark gray (10YR 4/1). NOTE: Strong odor.			
15	-15				0.8		(17.0 - 19.5') CLAY, medium plasticity, no dilatancy, trace silt, trace fine sand; soft; dark gray (10YR 4/1).			
20	-20	4	17.0-27.0'	10.0	0.1		(19.5 - 29.5') SILT and CLAY, low plasticity, no dilatancy, little fine sand, trace granules to small pebbles, subround; moist; medium stiff; dark gray (10YR 4/1).			
					0.1					Bentonite (0-65' bgs)

Remarks: bgs = below ground surface
No staining observed



Date Start: 06/13/2016 Date Finish: 06/13/2016 Drilling Company: Cascade Driller's Name: Scott Parkes Drilling Method: Rotosonic Sampling Method: 4X6 Casing Rig Type: Rotosonic Water Level Start (ft. bgs.): Water Level Finish (ft. btoc.):	Northing: NA Easting: NA Casing Elevation: NA Borehole Depth (ft. bgs.): 75.0 Surface Elevation: NA Descriptions By: K. Voet/A. Villhauer	Well/Boring ID: SB-A5.3-OR159/MW-16-79 Client: RACER Location: RACER Lansing Plant 2 Weather Conditions: 60 F, Cloudy
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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
25	-25				0.1					
					0.1					
					0.1					
30	-30	5	27.0-37.0'	10.0	0.1			(29.5 - 30.5') SAND, fine to medium, some silt, trace granules to medium pebble, subround poorly sorted; moist; dark gray (10YR 4/1).		
					0.1			(30.5 - 56.0') SILT, low plasticity, no dilatancy, little clay, little fine sand, trace granules to medium pebble, subround to subangular; moist; medium stiff; dark gray (10YR 4/1).		
					0.1					2" PVC well casing (0-68' bgs)
35	-35				0.1					
					0.1					
					0.1					
40	-40	6	37.0-47.0'	10.0	0.1					
					0.1					
					0.1					
45	-45				0.1					
					0.1					
					0.1					
50	-50				0.1					
					0.1					
					0.1					

Remarks: bgs = below ground surface
No staining observed



Date Start: 06/13/2016
Date Finish: 06/13/2016
Drilling Company: Cascade
Driller's Name: Scott Parkes
Drilling Method: Rotosonic
Sampling Method: 4X6 Casing
Rig Type: Rotosonic
Water Level Start (ft. bgs.):
Water Level Finish (ft. btoc.):

Northing: NA
Easting: NA
Casing Elevation: NA

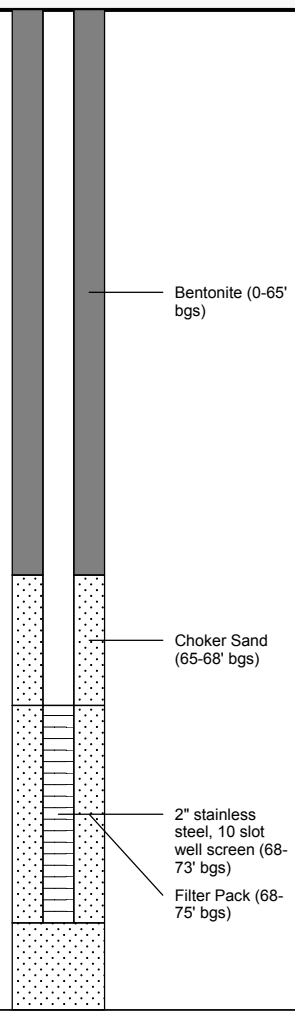
Borehole Depth (ft. bgs.): 75.0
Surface Elevation: NA

Descriptions By: K. Voet/A. Villhauer

Well/Boring ID: SB-A5.3-OR159/MW-16-79
Client: RACER
Location: RACER Lansing Plant 2

Weather Conditions: 60 F, Cloudy

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
55	-55	7	47.0-57.0'	10.0	0.1					
					0.1			(56.0 - 59.0') SAND, fine, trace silt, trace granules to coarse pebbles, subangular; moist; well sorted; grayish brown (10YR 5/2).		
60	-60				0.1			(59.0 - 62.0') SILT and CLAY, low plasticity, no dilatancy, little fine sand, trace granules to small pebbles, subangular; moist; stiff; dark gray (10YR 4/1).		
		8	57.0-67.0'	10.0	0.1			(62.0 - 75.0') SANDSTONE, weathered, interbedded with shale; dark grayish brown (10YR 4/2).		
65	-65				0.1					
					0.1					
70	-70	9	67.0-72.0	5.0	0.3			NOTE: VAP groundwater samples collected from 62' to 67' and 70' to 75' bgs.		
					0.4					
		10	72.0-75.0'	0.0	NA			NOTE: Hot rock melted bag.		
					NA					
75	-75							End of boring at 75' bgs.		




Remarks: bgs = below ground surface
 No staining observed



Date Start/Finish: 9/6/11-9/7/11 Drilling Company: MATECO Drilling Driller's Name: Jack Drilling Method: Sonic Drilling Sampling Method: Sonic Rig Type: Sonic	Northing: NA Easting: NA Casing Elevation: NA Borehole Depth: 30' bgs Surface Elevation: NA Descriptions By: Austin Westhuis	Well/Boring ID: P2-SB-2 Client: RACER Trust Location: Lansing Plant 2 Lansing, MI
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
					0.2				
					3.2				
					0.0				
					0.0				
-20	-20	5	(18-23)	4	0.2				
					0.1				
					1.1				
					0.4				
					0.0				
-25	-25	6	(23-28)	4	1.2			(25-30) SILT, little clay, high plasticity; trace small pebbles, subround; moist; medium stiff; gray (10YR 5/1).	
					1.0				
					2.2				
					0.8				
		7	(28-30)	2	0.1	X			
-30	-30							End of boring at 30' bgs	

 <i>Infrastructure · Water · Environment · Buildings</i>	Remarks: BGS = Below ground surface Groundwater not encountered. No odor or staining observed.
--	---

Date Start/Finish: 5.30.12
Drilling Company: Stock
Driller's Name: Chris Baker
Drilling Method: Geoprobe
Sampling Method: Macrocore
Rig Type: Geoprobe

Northing:
Easting:
Casing Elevation:

Borehole Depth: 17.0' bgs.
Surface Elevation:

Descriptions By: M.Meckley

Well/Boring ID: SB-A5.3-OR159
Client: RACER

Location: RACER Lansing Plant 2
 2801 West Saginaw
 Lansing, MI 48909


DEPTH (feet bgs.)	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	0							(0.0'-1.9') CONCRETE	
		1	1.0-5.0	5.0				(1.9'-5.0') SAND, very fine to fine, little medium; and CLAY, little silt, high plasticity; rapid dilatancy; soft; wet; very drak grayish brown (10YR 3/2). NOTE: SAND, some; at 3.0' bgs. NOTE: Trace granules to small pebbles, subangular; at 4.0' bgs.	
5	-5	2	5.0-9.0	2.9				(5.0'-8.5') CLAY, trace silt, high plsticity; rapid dilatancy; soft; trace grnaules, subangular; dry; very dark gray (10YR 3/1). with greenish gray (GLE Y1 5/5GY). NOTE: Odor observed. NOTE: Small seam of medium pebbles, angular; wet; at 7.2' bgs. NOTE: Dark yellowish brown (10YR 4/6) observed with other colors; also small sand seams, fine grained; at 7.5' bgs.	
10	-10	3	9.0-13.0	4.0				(8.5'-13.0') CLAY, medium plasticity; medium stiff to stiff; little silt; trace small pebbles, subrounded; no dilatancy; dry; dark yellowish brown (10YR 4/6) with gray (10YR 6/1).	

Remarks: bgs = below ground surface
 Groundwater encountered from 1.9' to 5.0' and at 7.2' bgs.
 Odor detected from 5.0'-8.5' and 13.0' to 17.0' bgs.
 Product observed on outside of boring (on plstic cone).
 No staining observed.




Date Start/Finish: 5.30.12 Drilling Company: Stock Driller's Name: Chris Baker Drilling Method: Geoprobe Sampling Method: Macrocore Rig Type: Geoprobe	Northing: Easting: Casing Elevation: Borehole Depth: 17.0' bgs. Surface Elevation: Descriptions By: M.Meckley	Well/Boring ID: SB-A5.3-OR159 Client: RACER Location: RACER Lansing Plant 2 2801 West Saginaw Lansing, MI 48909
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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	Well/Boring Construction
15	-15	4	13.0-17.0	4.0	0.4			(13.0'-17.0') CLAY, little silt, high plasticity; rapid dilatancy; soft; dry; dark grayish brown (10YR 4/2). NOTE: Slight odor.	
					0.7			NOTE: SAND seam, little very fine to small; at 15.0' bgs.	
					0.1			NOTE: Product observed on outside of boring (on plastic cone).	
					0.1			End of boring at 17.0' bgs.	

	Remarks: bgs = below ground surface Groundwater encountered from 1.9' to 5.0' and at 7.2' bgs. Odor detected from 5.0'-8.5' and 13.0' to 17.0' bgs. Product observed on outside of boring (on plastic cone). No staining observed.
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Date Start/Finish: 5.30.12 Drilling Company: Stock Driller's Name: Chris Baker Drilling Method: Geoprobe Sampling Method: Macrocore Rig Type: Geoprobe	Northing: Easting: Casing Elevation: Borehole Depth: 17.0' bgs. Surface Elevation: Descriptions By: M.Meckley	Well/Boring ID: SB-A5.3-OV154 Client: RACER Location: RACER Lansing Plant 2 2801 West Saginaw Lansing, MI 48909
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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	Well/Boring Construction
0	0							(0.0'-1.3') CONCRETE	
		1	1.0-5.0	5.0		X		(1.3'-17.0') CLAY, some silt, low plasticity; no dilatancy; medium stiff; little fine sand; dry; very dark yellowish brown (10YR 4/4). NOTE: Color change, dark yellow brown (10YR 4/4) with gray (10YR 5/1); trace sand; at 3.0' bgs.	
								NOTE: Black smearing; odor observed; at 6.0' bgs.	
		2	5.0-9.0	4.0		X		NOTE: Little very fine sand; 2" seam of reddish brown (5YR 4/2); at 6.5' bgs. NOTE: Gray (10YR 5/1) mottling; trace granules, subangular to subrounded; starting at 7.0' bgs.	
								NOTE: Slight product observed on the outside of boring; small sand seams observed; at 8.0' bgs.	
								NOTE: Color change, dark yellowish brown (10YR 4/6); from 9.0'-10.0' bgs.	
								NOTE: Color change, dark grayish brown (10YR 4/2), medium plasticity; rapid dilatancy 10.0' bgs.	
		3	9.0-13.0	4.0		X			

	Remarks: bgs = below ground surface No groundwater encountered. Odor detected at 6.0' bgs. Black staining observed at 6.0' bgs. Product observed on outside of boring at 8.0' bgs.
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Date Start/Finish: 5.30.12 Drilling Company: Stock Driller's Name: Chris Baker Drilling Method: Geoprobe Sampling Method: Macrocore Rig Type: Geoprobe	Northing: Easting: Casing Elevation: Borehole Depth: 17.0' bgs. Surface Elevation: Descriptions By: M.Meckley	Well/Boring ID: SB-A5.3-OV154 Client: RACER Location: RACER Lansing Plant 2 2801 West Saginaw Lansing, MI 48909
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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	Well/Boring Construction
15	-15	4	13.0-17.0	4.0	0.0			NOTE: Trace small to medium pebbles, subrounded to subangular; at 14.0' bgs.	
20	-20				0.0	X		End of boring at 17.0' bgs.	
25	-25				0.0				

 <p>ARCADIS Infrastructure · Water · Environment · Buildings</p>	Remarks: bgs = below ground surface No groundwater encountered. Odor detected at 6.0' bgs. Black staining observed at 6.0' bgs. Product observed on outside of boring at 8.0' bgs.
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Date Start/Finish: 5.30.12 Drilling Company: Stock Driller's Name: Chris Baker Drilling Method: Geoprobe Sampling Method: Macrocore Rig Type: Geoprobe	Northing: Easting: Casing Elevation: Borehole Depth: 17.0' bgs. Surface Elevation: Descriptions By: M.Meckley	Well/Boring ID: SB-A5.3-OV163 Client: RACER Location: RACER Lansing Plant 2 2801 West Saginaw Lansing, MI 48909
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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	Well/Boring Construction
0	0							(0.0'-0.3') CONCRETE. NOTE: Ground through concrete and debris; could not hand auger.	
		1	1.0-5.0	5.0		X		(0.3'-2.5') SAND, very fine to medium; some silt; some clay; poorly sorted; trace granules, subangular; moist; gray (10YR 6/1). NOTE: lighter due due to ground concrete.	
								(2.5'-7.0') SAND, medium, little fine; trace clay; well sorted; wet; grayish brown (10YR 5/2).	
5	-5							NOTE: Sheen observed and odor detected from 5.0'-7.0' bgs.	
		2	5.0-9.0	3.0		X		(7.0'-17.0') CLAY, little silt, low plasticity; no dilatancy; medium stiff to stiff; trace very fine sand; dry; dark yellowish brown (10YR 4/6).	
								NOTE: Very stiff to hard; no sand; trace silt; at 10.0' bgs.	
10	-10							NOTE: Stiff to medium stiff at 11.5' bgs.	
		3	9.0-13.0	4.0					

	Remarks: bgs = below ground surface Groundwater encountered from 2.5'-7.0' bgs. Sheen observed 5.0'-7.0' bgs. No odor.
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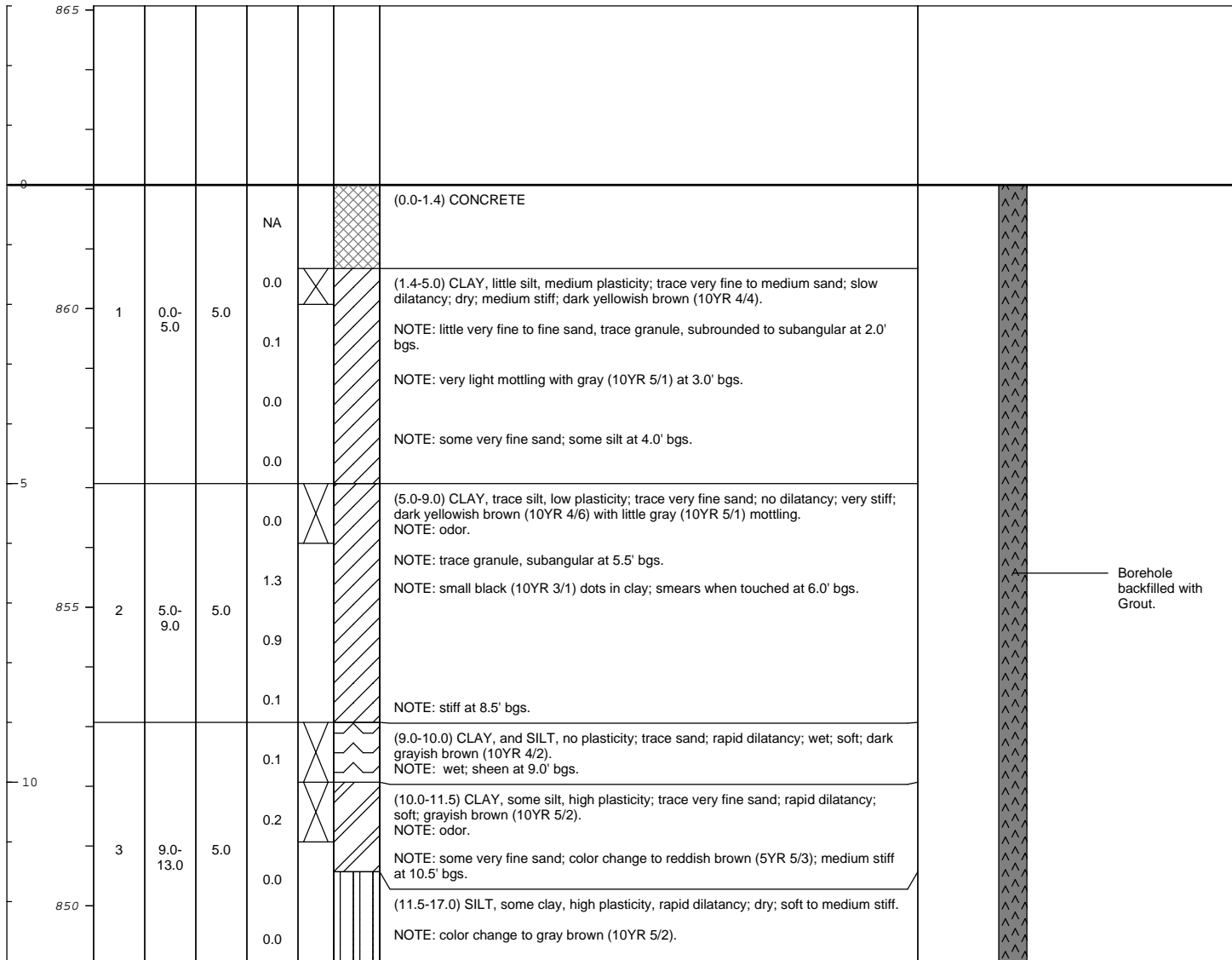
Date Start/Finish: 5.30.12 Drilling Company: Stock Driller's Name: Chris Baker Drilling Method: Geoprobe Sampling Method: Macrocore Rig Type: Geoprobe	Northing: Easting: Casing Elevation: Borehole Depth: 17.0' bgs. Surface Elevation: Descriptions By: M.Meckley	Well/Boring ID: SB-A5.3-OV163 Client: RACER Location: RACER Lansing Plant 2 2801 West Saginaw Lansing, MI 48909
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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	Well/Boring Construction
15	-15	4	13.0-17.0	4.0	0.0			NOTE: Little sand, medium plasticity; rapid dilatancy; medium stiff; at 13.0' bgs.	
20	-20				0.0			End of boring at 17.0' bgs.	
25	-25				0.0				

	Remarks: bgs = below ground surface Groundwater encountered from 2.5'-7.0' bgs. Sheen observed 5.0'-7.0' bgs. No odor.
--	--

Date Start/Finish: 5/31/12 Drilling Company: Stock Driller's Name: Chris Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450795.95 Easting: 13065124.29 Casing Elevation: NA Borehole Depth: 17.0' bgs Surface Elevation: 862.07 Descriptions By: Megan Meckley	Well/Boring ID: SB-A5.3-PA159 Client: RACER Trust Location: Lansing, MI
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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	Remarks: BGS = Below ground surface
	Groundwater detected at 9.0' bgs Odor detected between 5.0'-9.0' and 10.0'-11.5' bgs Sheen detected at 9.0' bgs

Date Start/Finish: 5/31/12 Drilling Company: Stock Driller's Name: Chris Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450795.95 Easting: 13065124.29 Casing Elevation: NA Borehole Depth: 17.0' bgs Surface Elevation: 862.07 Descriptions By: Megan Meckley	Well/Boring ID: SB-A5.3-PA159 Client: RACER Trust Location: Lansing, MI
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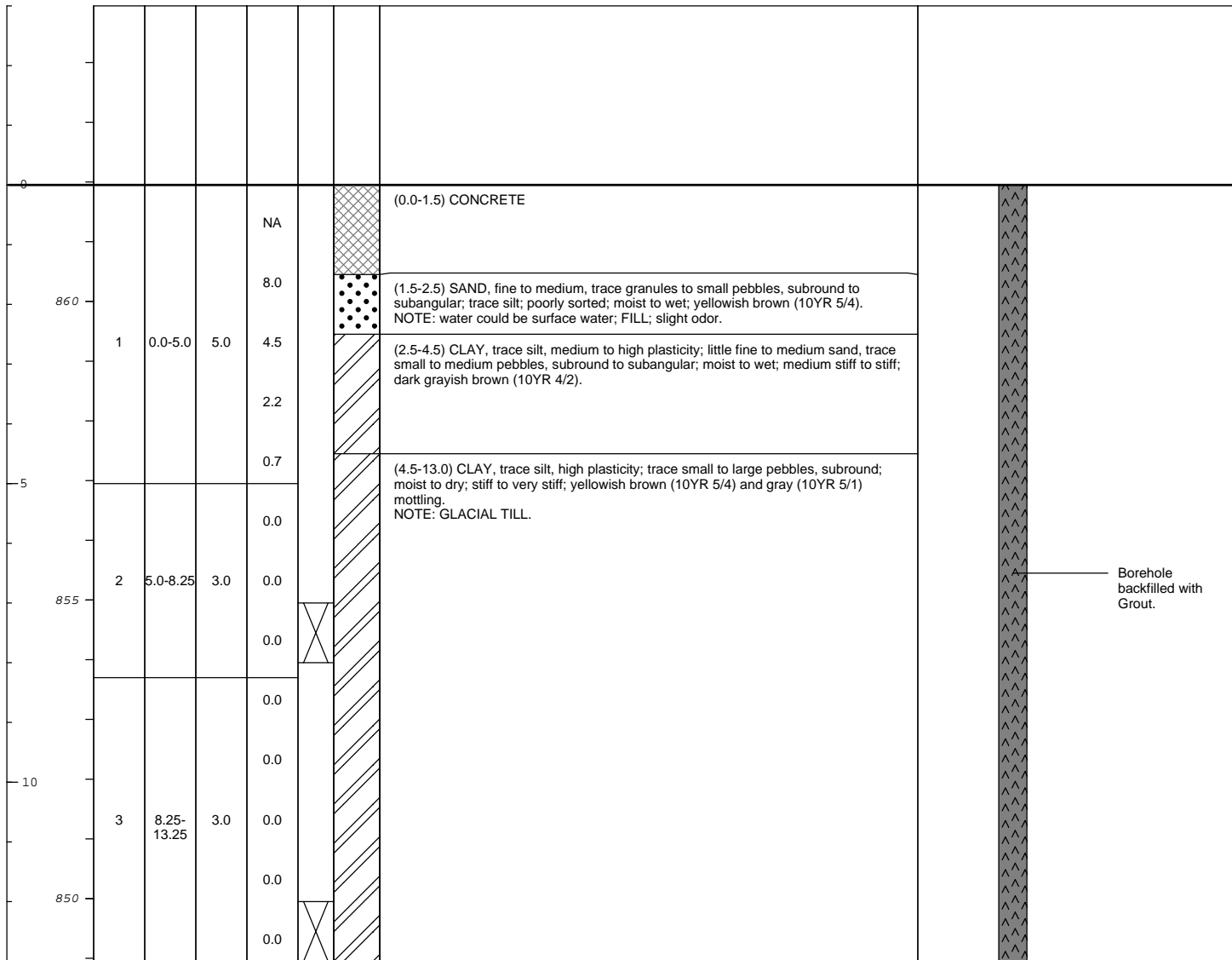
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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15		4	13.0-17.0	5.0	0.0			NOTE: moist; some very fine sand from 13.0'-14.0' bgs.	 Borehole backfilled with Grout.
					0.0			NOTE: medium stiff to stiff; medium plasticity; trace granule, subangular at 15.0' bgs.	
845								End of Boring at 17.0' bgs.	
20									
840									
25									
835									

	Remarks: BGS = Below ground surface
	Groundwater detected at 9.0' bgs Odor detected between 5.0'-9.0' and 10.0'-11.5' bgs Sheen detected at 9.0' bgs

Date Start/Finish: 5/10/12 Drilling Company: GeoServe Driller's Name: Rick Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450844.86 Easting: 13065127.52 Casing Elevation: NA Borehole Depth: 48.25' bgs Surface Elevation: 861.95 Descriptions By: Austin Westhuis	Well/Boring ID: VAP-A5.3-OV159 Client: RACER Trust Location: Lansing, MI
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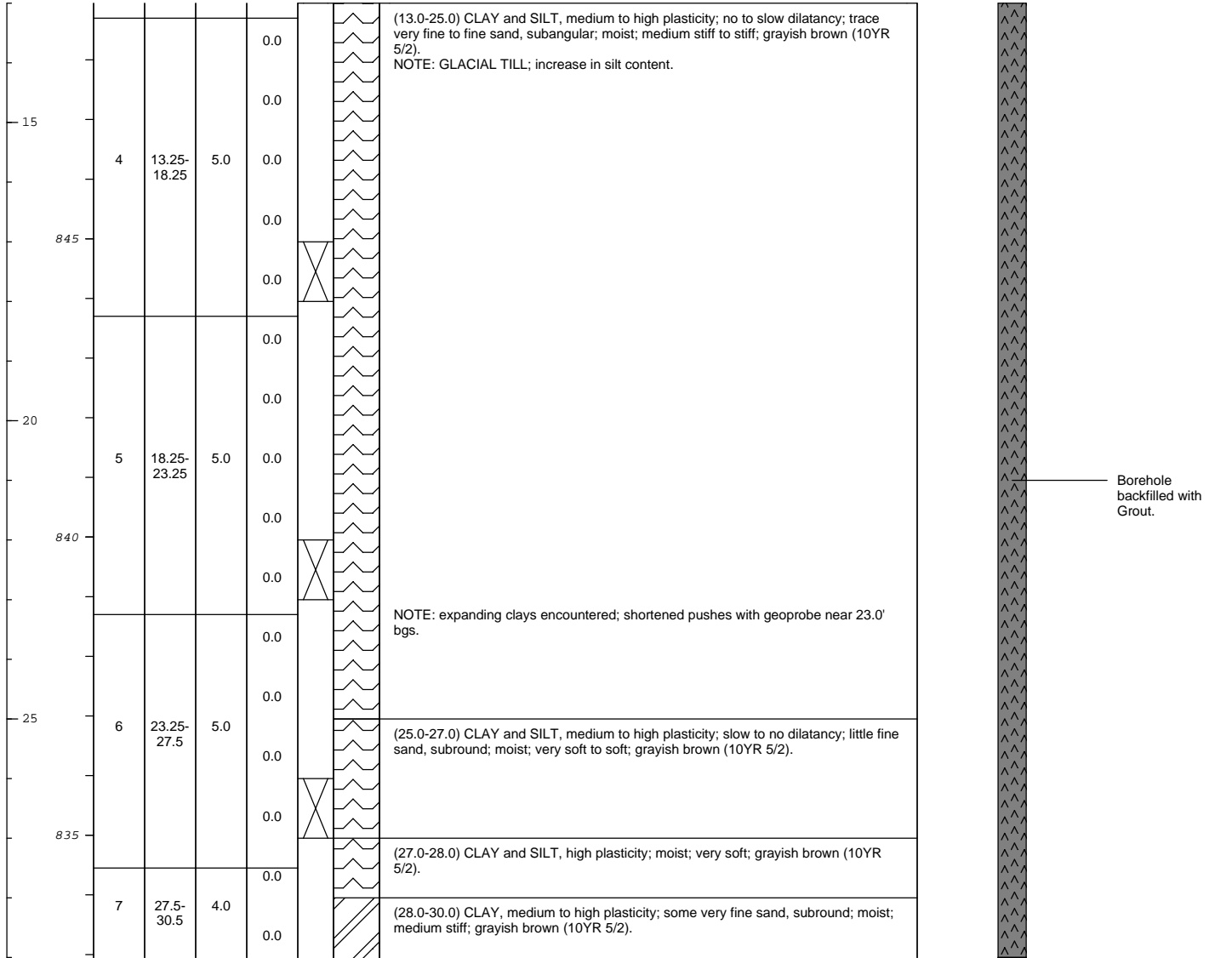
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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	Remarks: BGS = Below ground surface Groundwater detected between 1.7'-2.0', 2.5'-7.5', and 10.8'-11.7' bgs Odor detected between 7.5'-10.8' bgs No staining observed
--	--

Date Start/Finish: 5/10/12 Drilling Company: GeoServe Driller's Name: Rick Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450844.86 Easting: 13065127.52 Casing Elevation: NA Borehole Depth: 48.25' bgs Surface Elevation: 861.95 Descriptions By: Austin Westhuis	Well/Boring ID: VAP-A5.3-OV159 Client: RACER Trust Location: Lansing, MI
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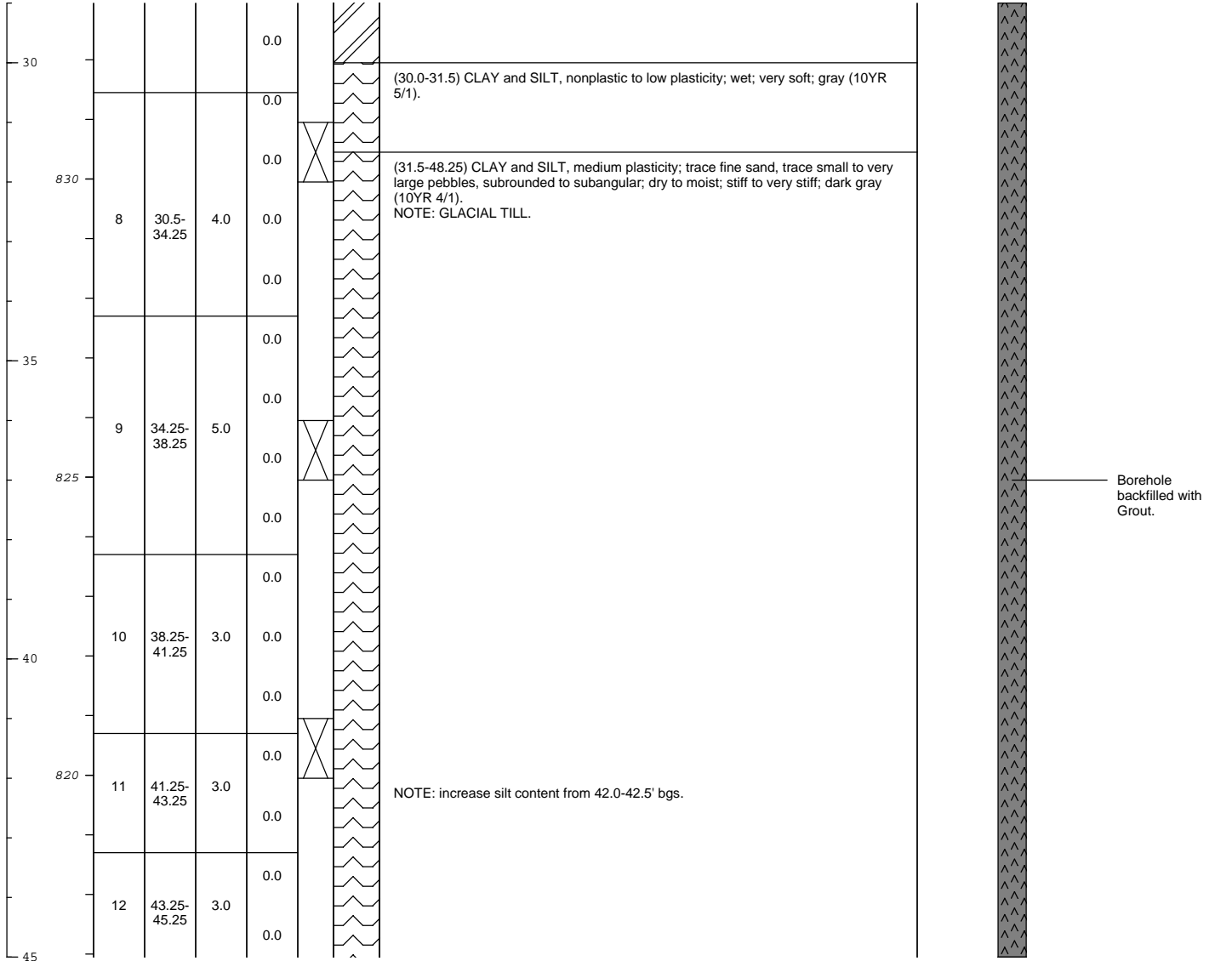
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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	Remarks: BGS = Below ground surface Groundwater detected between 1.7'-2.0', 2.5'-7.5', and 10.8'-11.7' bgs Odor detected between 7.5'-10.8' bgs No staining observed
--	--

Date Start/Finish: 5/10/12 Drilling Company: GeoServe Driller's Name: Rick Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450844.86 Easting: 13065127.52 Casing Elevation: NA Borehole Depth: 48.25' bgs Surface Elevation: 861.95 Descriptions By: Austin Westhuis	Well/Boring ID: VAP-A5.3-OV159 Client: RACER Trust Location: Lansing, MI
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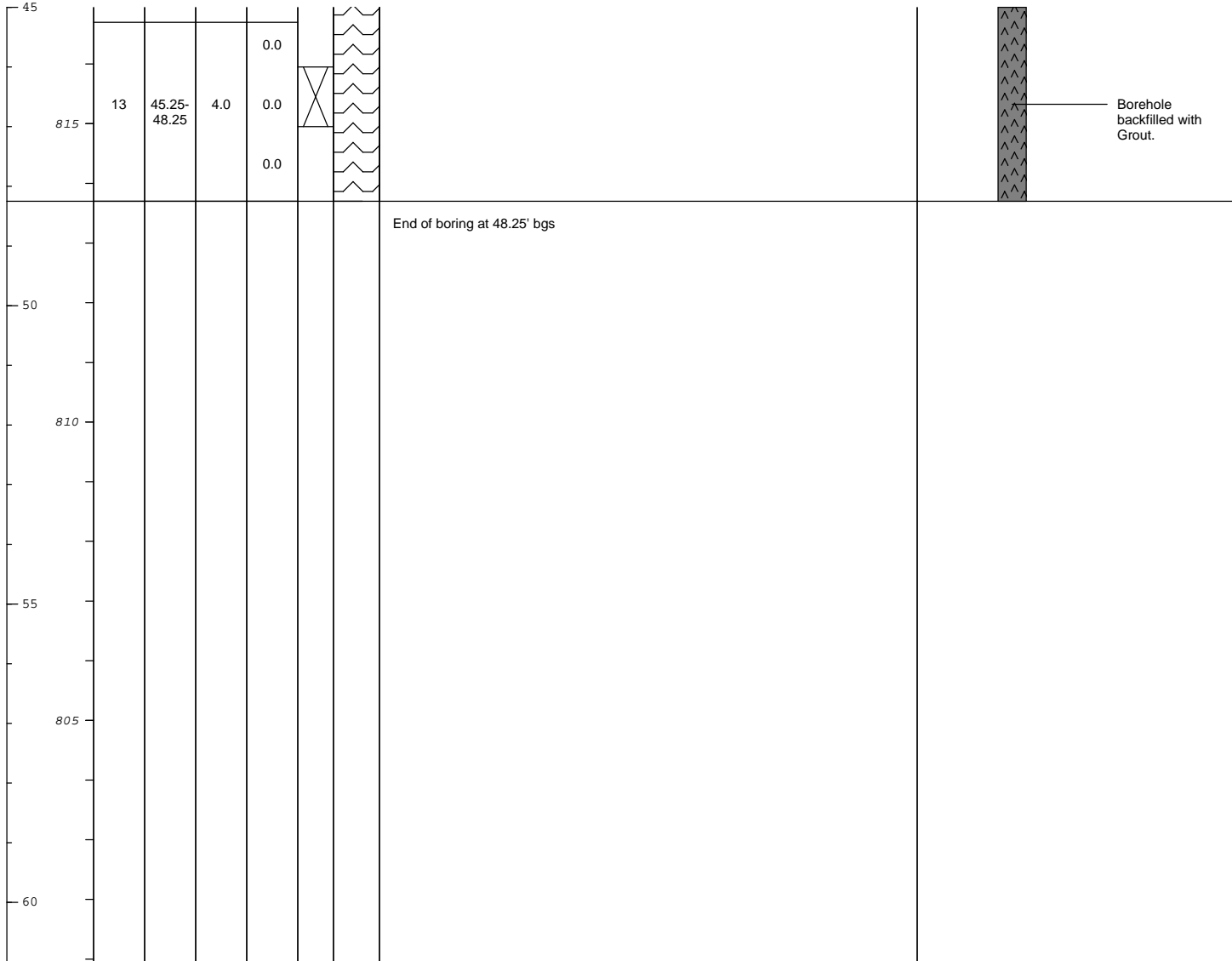
DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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	Remarks: BGS = Below ground surface
	Groundwater detected between 1.7'-2.0', 2.5'-7.5', and 10.8'-11.7' bgs Odor detected between 7.5'-10.8' bgs No staining observed

Date Start/Finish: 5/10/12 Drilling Company: GeoServe Driller's Name: Rick Drilling Method: Geoprobe Sampling Method: Dual-tube Rig Type: Geoprobe	Northing: 450844.86 Easting: 13065127.52 Casing Elevation: NA Borehole Depth: 48.25' bgs Surface Elevation: 861.95 Descriptions By: Austin Westhuis	Well/Boring ID: VAP-A5.3-OV159 Client: RACER Trust Location: Lansing, MI
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	PID Headspace (ppm)	Analytical Sample	Geologic Column	Stratigraphic Description	Well/Boring Construction
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	Remarks: BGS = Below ground surface
	Groundwater detected between 1.7'-2.0', 2.5'-7.5', and 10.8'-11.7' bgs Odor detected between 7.5'-10.8' bgs No staining observed

Attachment 2

Laboratory Analytical Reports



Analytical Laboratory Report

Report ID: S42114.01(01)+QC01
Generated on 11/14/2022

Report to

Attention: Kaitlyn Hunt
Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 C:947-777-5215 FAX:
Email: Kaitlyn.Hunt@arcadis.com

Additional Contacts: Marina Samp, Tiffany Linder, Caitlin Cisco, Alex Villhauer

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:
John Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S42114.01-S42114.02
Project: 30112892.0470B / Racer Lansing
Collected Date(s): 11/02/2022
Submitted Date/Time: 11/03/2022 08:15
Sampled by: Austin Westhuis
P.O. #: 30112892.0470B

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)
- QC Report (Pages 12-36)

Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition 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).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

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.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

Report Narrative

There is no additional narrative for this analytical report



Analytical Laboratory Report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



Analytical Laboratory Report

Method Summary

Method	Version
N/A	Not Applicable
SW3510C	SW 846 Method 3510C Revision 3 December 1996
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003
SW8260B - SIM	SW 846 Method 8260B Revision 2 December 1996 SIMs
SW8270D	SW 846 Method 8270D Revision 4 February 2007



Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S42114.01	MW-16-79_110222	Groundwater	11/02/22 17:00
S42114.02	Trip Blank	Water	11/02/22 00:01



Analytical Laboratory Report

Lab Sample ID: S42114.01

Sample Tag: MW-16-79_110222

Collected Date/Time: 11/02/2022 17:00

Matrix: Groundwater

COC Reference: 155479

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	5.8	IR
2	1L Amber	None	Yes	5.8	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/22 13:00	BML	
BNA Extraction	Completed	SW3510C	11/08/22 11:00	TAW	

Organics - Semi-Volatiles

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 11/09/22 22:07, Analyst: PL

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acenaphthene	Not detected	5		ug/L	7.5	83-32-9	
Acenaphthylene	Not detected	5		ug/L	7.5	208-96-8	
Anthracene	Not detected	5		ug/L	7.5	120-12-7	
Benzo(a)anthracene	Not detected	4		ug/L	7.5	56-55-3	X
Benzo(b)fluoranthene	Not detected	4		ug/L	7.5	205-99-2	X
Benzo(k)fluoranthene	Not detected	4		ug/L	7.5	207-08-9	X
Benzo(ghi)perylene	Not detected	4		ug/L	7.5	191-24-2	X
Benzo(a)pyrene	Not detected	4		ug/L	7.5	50-32-8	X
bis(2-Chloroethoxy)methane	Not detected	5		ug/L	7.5	111-91-1	
bis(2-Chloroethyl)ether	Not detected	5		ug/L	7.5	111-44-4	
bis(2-Chloroisopropyl)ether*	Not detected	5		ug/L	7.5	108-60-1	
bis(2-Ethylhexyl)phthalate	Not detected	5		ug/L	7.5	117-81-7	
4-Bromophenyl phenyl ether	Not detected	5		ug/L	7.5	101-55-3	
Butyl benzyl phthalate	Not detected	5		ug/L	7.5	85-68-7	
4-Chloroaniline	Not detected	10		ug/L	7.5	106-47-8	
2-Chloronaphthalene	Not detected	5		ug/L	7.5	91-58-7	
4-Chloro-3-methylphenol	Not detected	5		ug/L	7.5	59-50-7	
2-Chlorophenol	Not detected	10		ug/L	7.5	95-57-8	
4-Chlorophenyl phenyl ether	Not detected	5		ug/L	7.5	7005-72-3	
Chrysene	9	4		ug/L	7.5	218-01-9	X
3-, 4-Methylphenol (p,m-Cresol)	Not detected	20		ug/L	7.5	3/4-CRESOL	
2-Methylphenol (o-Cresol)	Not detected	10		ug/L	7.5	95-48-7	
Dibenzo(ah)anthracene	Not detected	4		ug/L	7.5	53-70-3	X
Dibenzofuran	Not detected	4		ug/L	7.5	132-64-9	
di-n-Butyl phthalate	Not detected	5		ug/L	7.5	84-74-2	
1,2-Dichlorobenzene	Not detected	4		ug/L	7.5	95-50-1	X
1,3-Dichlorobenzene	Not detected	4		ug/L	7.5	541-73-1	X
1,4-Dichlorobenzene	Not detected	4		ug/L	7.5	106-46-7	X
3,3'-Dichlorobenzidine	Not detected	5		ug/L	7.5	91-94-1	
2,4-Dichlorophenol	Not detected	10		ug/L	7.5	120-83-2	
Diethyl phthalate	Not detected	5		ug/L	7.5	84-66-2	
2,4-Dimethylphenol	Not detected	5		ug/L	7.5	105-67-9	
Dimethyl phthalate	Not detected	5		ug/L	7.5	131-11-3	
4,6-Dinitro-2-methylphenol	Not detected	20		ug/L	7.5	534-52-1	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S42114.01 (continued)

Sample Tag: MW-16-79_110222

Semi-Volatile Organics - MDEQ, Method: SW8270D, Run Date: 11/09/22 22:07, Analyst: PL (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2,4-Dinitrophenol	Not detected	25		ug/L	7.5	51-28-5	
2,4-Dinitrotoluene	Not detected	5		ug/L	7.5	121-14-2	
2,6-Dinitrotoluene	Not detected	5		ug/L	7.5	606-20-2	
1,2-Diphenylhydrazine*	Not detected	5		ug/L	7.5	122-66-7	
di-n-Octyl phthalate	Not detected	5		ug/L	7.5	117-84-0	
Fluoranthene	Not detected	4		ug/L	7.5	206-44-0	X
Fluorene	Not detected	5		ug/L	7.5	86-73-7	
Hexachlorobenzene	Not detected	5		ug/L	7.5	118-74-1	
Hexachlorobutadiene	Not detected	10		ug/L	7.5	87-68-3	
Hexachlorocyclopentadiene*	Not detected	5		ug/L	7.5	77-47-4	
Hexachloroethane	Not detected	5		ug/L	7.5	67-72-1	
Indeno(1,2,3-cd)pyrene	Not detected	4		ug/L	7.5	193-39-5	X
Isophorone	Not detected	5		ug/L	7.5	78-59-1	
2-Methylnaphthalene	Not detected	5		ug/L	7.5	91-57-6	
Naphthalene	Not detected	5		ug/L	7.5	91-20-3	
2-Nitroaniline	Not detected	25		ug/L	7.5	88-74-4	
3-Nitroaniline	Not detected	25		ug/L	7.5	99-09-2	
4-Nitroaniline	Not detected	25		ug/L	7.5	100-01-6	
Nitrobenzene	Not detected	5		ug/L	7.5	98-95-3	
2-Nitrophenol	Not detected	5		ug/L	7.5	88-75-5	
4-Nitrophenol	Not detected	25		ug/L	7.5	100-02-7	
N-Nitrosodiphenylamine	Not detected	5		ug/L	7.5	86-30-6	
N-Nitrosodi-n-propylamine	Not detected	5		ug/L	7.5	621-64-7	
Pentachlorophenol	Not detected	5		ug/L	7.5	87-86-5	
Phenanthrene	9	4		ug/L	7.5	85-01-8	X
Phenol	Not detected	5		ug/L	7.5	108-95-2	
Pyrene	5	5		ug/L	7.5	129-00-0	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	7.5	120-82-1	
2,4,5-Trichlorophenol	Not detected	5		ug/L	7.5	95-95-4	
2,4,6-Trichlorophenol	Not detected	4		ug/L	7.5	88-06-2	

Organics - Volatiles

Method: SW8260B - SIM, Run Date: 11/11/22 20:48, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
1,4-Dioxane*	Not detected	1		ug/L	1	123-91-1	

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/05/22 04:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S42114.01 (continued)

Sample Tag: MW-16-79_110222

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/05/22 04:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	



Analytical Laboratory Report

Lab Sample ID: S42114.01 (continued)

Sample Tag: MW-16-79_110222

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/05/22 04:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	



Analytical Laboratory Report

Lab Sample ID: S42114.02

Sample Tag: Trip Blank

Collected Date/Time: 11/02/2022 00:01

Matrix: Water

COC Reference: 155479

Sample Containers

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

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	11/07/22 13:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/05/22 01:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
Acetone	Not detected	50		ug/L	1	67-64-1	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Benzene	Not detected	1		ug/L	1	71-43-2	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Toluene	Not detected	1		ug/L	1	108-88-3	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	



Analytical Laboratory Report

Lab Sample ID: S42114.02 (continued)

Sample Tag: Trip Blank

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 11/05/22 01:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	
p,m-Xylene*	Not detected	2		ug/L	1		
o-Xylene	Not detected	1		ug/L	1	95-47-6	
Styrene	Not detected	1		ug/L	1	100-42-5	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
Bromoform	Not detected	1		ug/L	1	75-25-2	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	



Quality Control Report

Report ID: S42114.01(01)+QC01

Generated on 11/14/2022

Report to

Attention: Kaitlyn Hunt

Arcadis

28550 Cabot Drive

Suite 500

Novi, MI 48377

Report Produced by

Merit Laboratories

2680 East Lansing Drive

East Lansing, MI 48823

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

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Report Summary

Lab Sample ID(s): S42114.01-S42114.02

Project: 30112892.0470B / Racer Lansing

Submitted Date/Time: 11/03/2022 08:15

Sampled by: Austin Westhuis

P.O. #: 30112892.0470B

QC Report Sections

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Analysis Summary (Pages 13-14)

Prep Batch Summary (Page 15)

Surrogates per Lab Sample (Pages 16-17)

Surrogates per QC Sample (Pages 18-20)

Internal Standards per Lab Sample (Pages 21-22)

Internal Standards per QC Sample (Pages 23-25)

Batch QC Results (Pages 26-36)

Report Flag Descriptions

*: QC result is outside of indicated control limits

W: Surrogate result not applicable due to sample dilution

I certify that this data package is in compliance with the terms and conditions of the program, and project, and contractual requirements both technically and for completeness. Release of the data contained in this hardcopy data package and its computer-readable data submitted has been authorized by the Quality Assurance Manager and his/her designee, as verified by the following signature.

Barbara Ball

Quality Assurance Manager

QC Report - Analysis Summary

Lab Sample ID: S42114.01

Sample Tag: MW-16-79_110222

Collected Date/Time: 11/02/2022 17:00

Matrix: Groundwater

COC Reference: 155479

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Semi-Volatiles						
Semi-Volatile Organics - MDEQ	SW8270D	11/09/22 22:07	P221109B	SF221108W1	Yes	BLK/LCS/LCSD
Organics - Volatiles						
1,4-Dioxane	SW8260B - SIM	11/11/22 20:48	221111B9	VS221111W1	Yes	BLK/LCS/LCSD
Volatile Organics - DEQ List	SW5030C/8260C	11/05/22 04:54	221104C9	VF221104W4	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S42114.02

Sample Tag: Trip Blank

Collected Date/Time: 11/02/2022 00:01

Matrix: Water

COC Reference: 155479

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	11/05/22 01:41	221104C9	VF221104W4	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S42114.01	Semi-Volatile Organics - MDEQ	SW8270D	11/09/22 22:07	P221109B

Organics - Volatiles, Prep Batch ID: VF221104W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S42114.01	Volatile Organics - DEQ List	SW5030C/8260C	11/05/22 04:54	221104C9
S42114.02	Volatile Organics - DEQ List	SW5030C/8260C	11/05/22 01:41	221104C9

Organics - Volatiles, Prep Batch ID: VS221111W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S42114.01	1,4-Dioxane	SW8260B - SIM	11/11/22 20:48	221111B9

QC Report - Surrogates per Lab Sample

Lab Sample ID: S42114.01

Sample Tag: MW-16-79_110222

Collected Date/Time: 11/02/2022 17:00

Matrix: Groundwater

COC Reference: 155479

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P221109B, Run Date: 11/09/2022 22:07, Matrix: WW, Dilution: 7.5

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		23.9	10.0	110.0
Phenol-D5		17.7	10.0	110.0
Nitrobenzene-D5		61.1	10.0	114.0
2-Fluorobiphenyl		76.4	10.0	116.0
2,4,6-Tribromophenol		60.6	10.0	123.0
Terphenyl-D14		80.7	10.0	141.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 221104C9, Run Date: 11/05/2022 04:54, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		102.1	80.0	124.0
1,2-Dichloroethane-D4		107.5	72.0	125.0
Toluene-D8		98.3	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S42114.02

Sample Tag: Trip Blank

Collected Date/Time: 11/02/2022 00:01

Matrix: Water

COC Reference: 155479

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 221104C9, Run Date: 11/05/2022 01:41, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		101.5	80.0	124.0
1,2-Dichloroethane-D4		99.5	72.0	125.0
Toluene-D8		97.7	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P221109.BLKW08A

Run in Batch: P221109, Run Date: 11/09/2022 15:02, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
No Surrogates				

Blank (BLK)

Lab Sample ID: P221109B.BLKW08A

Run in Batch: P221109B, Run Date: 11/09/2022 19:33, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		27.0	10.0	110.0
Phenol-D5		18.4	10.0	110.0
Nitrobenzene-D5		63.6	10.0	114.0
2-Fluorobiphenyl		61.1	10.0	116.0
2,4,6-Tribromophenol		55.3	10.0	123.0
Terphenyl-D14		64.7	10.0	141.0

Laboratory Control Sample (LCS)

Lab Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:04, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		34.3	10.0	110.0
Phenol-D5		24.7	10.0	110.0
Nitrobenzene-D5		73.9	10.0	114.0
2-Fluorobiphenyl		73.9	10.0	116.0
2,4,6-Tribromophenol		75.0	10.0	123.0
Terphenyl-D14		77.5	10.0	141.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P221109B.LCSDW08A, Parent Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:36, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
2-Fluorophenol		33.7	10.0	110.0
Phenol-D5		24.4	10.0	110.0
Nitrobenzene-D5		73.7	10.0	114.0
2-Fluorobiphenyl		73.8	10.0	116.0
2,4,6-Tribromophenol		68.2	10.0	123.0
Terphenyl-D14		77.9	10.0	141.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF221104W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221104C9.BLKW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 01:22, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		101.6	80.0	124.0
1,2-Dichloroethane-D4		100.9	72.0	125.0
Toluene-D8		97.9	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:04, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		104.1	80.0	124.0
1,2-Dichloroethane-D4		102.9	72.0	125.0
Toluene-D8		98.3	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221104C9.LCSDW04B, Parent Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:23, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		100.6	80.0	124.0
1,2-Dichloroethane-D4		97.6	72.0	125.0
Toluene-D8		98.3	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VS221111W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221111B9.BLKW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 20:26, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

Laboratory Control Sample (LCS)

Lab Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:04, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221111B9.LCSDW11A, Parent Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:25, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
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No Surrogates

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S42114.01

Sample Tag: MW-16-79_110222

Collected Date/Time: 11/02/2022 17:00

Matrix: Groundwater

COC Reference: 155479

Organics - Semi-Volatiles, Analysis: Semi-Volatile Organics - MDEQ

Run in Batch: P221109B, Run Date: 11/09/2022 22:07, Matrix: WW, Dilution: 7.5

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		96.2	50.0	200.0
Naphthalene-D8		94.8	50.0	200.0
Acenaphthalene-D10		94.9	50.0	200.0
Phenanthrene-D10		93.9	50.0	200.0
Chrysene-D12		92.5	50.0	200.0
Perylene-D12		89.1	50.0	200.0

Organics - Volatiles, Analysis: 1,4-Dioxane

Run in Batch: 221111B9, Run Date: 11/11/2022 20:48, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		114.2	50.0	200.0

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 221104C9, Run Date: 11/05/2022 04:54, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		102.1	50.0	200.0
1,4-Difluorobenzene		105.3	50.0	200.0
Chlorobenzene-D5		108.5	50.0	200.0
1,4-Dichlorobenzene-D4		109.2	50.0	200.0

QC Report - Internal Standards per Lab Sample

Lab Sample ID: S42114.02

Sample Tag: Trip Blank

Collected Date/Time: 11/02/2022 00:01

Matrix: Water

COC Reference: 155479

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 221104C9, Run Date: 11/05/2022 01:41, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		101.1	50.0	200.0
1,4-Difluorobenzene		103.5	50.0	200.0
Chlorobenzene-D5		103.1	50.0	200.0
1,4-Dichlorobenzene-D4		102.1	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P221109.BLKW08A

Run in Batch: P221109, Run Date: 11/09/2022 15:02, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Chrysene-D12		146.4	50.0	200.0
Acenaphthalene-D10		146.3	50.0	200.0

Blank (BLK)

Lab Sample ID: P221109B.BLKW08A

Run in Batch: P221109B, Run Date: 11/09/2022 19:33, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		94.8	50.0	200.0
Naphthalene-D8		89.7	50.0	200.0
Acenaphthalene-D10		92.4	50.0	200.0
Phenanthrene-D10		92.0	50.0	200.0
Chrysene-D12		82.7	50.0	200.0
Perylene-D12		78.9	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:04, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		90.7	50.0	200.0
Naphthalene-D8		88.9	50.0	200.0
Acenaphthalene-D10		88.8	50.0	200.0
Phenanthrene-D10		90.2	50.0	200.0
Chrysene-D12		88.3	50.0	200.0
Perylene-D12		86.5	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P221109B.LCSDW08A, Parent Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:36, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dichlorobenzene-D4		93.7	50.0	200.0
Naphthalene-D8		90.8	50.0	200.0
Acenaphthalene-D10		91.4	50.0	200.0
Phenanthrene-D10		89.7	50.0	200.0
Chrysene-D12		87.4	50.0	200.0
Perylene-D12		87.1	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VF221104W4

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221104C9.BLKW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 01:22, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		102.6	50.0	200.0
1,4-Difluorobenzene		105.0	50.0	200.0
Chlorobenzene-D5		105.6	50.0	200.0
1,4-Dichlorobenzene-D4		104.8	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:04, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		100.9	50.0	200.0
1,4-Difluorobenzene		102.7	50.0	200.0
Chlorobenzene-D5		102.3	50.0	200.0
1,4-Dichlorobenzene-D4		104.3	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221104C9.LCSDW04B, Parent Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:23, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
Pentafluorobenzene		101.4	50.0	200.0
1,4-Difluorobenzene		101.6	50.0	200.0
Chlorobenzene-D5		100.5	50.0	200.0
1,4-Dichlorobenzene-D4		98.3	50.0	200.0

QC Report - Internal Standards per QC Sample

Organics - Volatiles, Prep Batch ID: VS221111W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221111B9.BLKW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 20:26, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		106.0	50.0	200.0

Laboratory Control Sample (LCS)

Lab Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:04, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		108.7	50.0	200.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221111B9.LCSDW11A, Parent Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:25, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Internal Standard	Flags	%Rec	LCL	UCL
1,4-Dioxane-D8		96.8	50.0	200.0

QC Report - Batch QC Results

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: P221109.BLKW08A

Run in Batch: P221109, Run Date: 11/09/2022 15:02, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Benzo(a)pyrene		ND	0.00001	mg/l
Hexachlorobenzene		ND	0.00001	mg/l
Hexachlorobutadiene		ND	0.00001	mg/l
Hexachlorocyclopentadiene		ND	0.00001	mg/l

Blank (BLK)

Lab Sample ID: P221109B.BLKW08A

Run in Batch: P221109B, Run Date: 11/09/2022 19:33, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acenaphthene		ND	0.00050	mg/l
Acenaphthylene		ND	0.00050	mg/l
Anthracene		ND	0.00050	mg/l
Benzo(a)anthracene		ND	0.00050	mg/l
Benzo(b)fluoranthene		ND	0.00050	mg/l
Benzo(k)fluoranthene		ND	0.00050	mg/l
Benzo(ghi)perylene		ND	0.00050	mg/l
Benzo(a)pyrene		ND	0.00050	mg/l
bis(2-Chloroethoxy)methane		ND	0.00050	mg/l
bis(2-Chloroethyl)ether		ND	0.00050	mg/l
bis(2-Chloroisopropyl)ether		ND	0.00050	mg/l
bis(2-Ethylhexyl)phthalate		ND	0.00050	mg/l
4-Bromophenyl phenyl ether		ND	0.00050	mg/l
Butyl benzyl phthalate		ND	0.00050	mg/l
4-Chloroaniline		ND	0.00050	mg/l
2-Chloronaphthalene		ND	0.00050	mg/l
4-Chloro-3-methylphenol		ND	0.00050	mg/l
2-Chlorophenol		ND	0.00050	mg/l
4-Chlorophenyl phenyl ether		ND	0.00050	mg/l
Chrysene		ND	0.00050	mg/l
3-, 4-Methylphenol (p,m-Cresol)		ND	0.00050	mg/l
2-Methylphenol (o-Cresol)		ND	0.00050	mg/l
Dibenzo(ah)anthracene		ND	0.00050	mg/l
Dibenzofuran		ND	0.00050	mg/l
di-n-Butyl phthalate		ND	0.00050	mg/l
1,2-Dichlorobenzene		ND	0.00050	mg/l
1,3-Dichlorobenzene		ND	0.00050	mg/l
1,4-Dichlorobenzene		ND	0.00050	mg/l
3,3'-Dichlorobenzidine		ND	0.00050	mg/l
2,4-Dichlorophenol		ND	0.00050	mg/l
Diethyl phthalate		ND	0.00050	mg/l
2,4-Dimethylphenol		ND	0.00050	mg/l
Dimethyl phthalate		ND	0.00050	mg/l
4,6-Dinitro-2-methylphenol		ND	0.00050	mg/l
2,4-Dinitrophenol		ND	0.00050	mg/l
2,4-Dinitrotoluene		ND	0.00050	mg/l
2,6-Dinitrotoluene		ND	0.00050	mg/l

QC Report - Batch QC Results

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: P221109B.BLKW08A

Run in Batch: P221109B, Run Date: 11/09/2022 19:33, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,2-Diphenylhydrazine		ND	0.00050	mg/l
di-n-Octyl phthalate		ND	0.00050	mg/l
Fluoranthene		ND	0.00050	mg/l
Fluorene		ND	0.00050	mg/l
Hexachlorobenzene		ND	0.00050	mg/l
Hexachlorobutadiene		ND	0.00050	mg/l
Hexachlorocyclopentadiene		ND	0.00050	mg/l
Hexachloroethane		ND	0.00050	mg/l
Indeno(1,2,3-cd)pyrene		ND	0.00050	mg/l
Isophorone		ND	0.00050	mg/l
2-Methylnaphthalene		ND	0.00050	mg/l
Naphthalene		ND	0.00050	mg/l
2-Nitroaniline		ND	0.00050	mg/l
3-Nitroaniline		ND	0.00050	mg/l
4-Nitroaniline		ND	0.00050	mg/l
Nitrobenzene		ND	0.00050	mg/l
2-Nitrophenol		ND	0.00050	mg/l
4-Nitrophenol		ND	0.00050	mg/l
N-Nitrosodiphenylamine		ND	0.00050	mg/l
N-Nitrosodi-n-propylamine		ND	0.00050	mg/l
Pentachlorophenol		ND	0.00050	mg/l
Phenanthrene		ND	0.00050	mg/l
Phenol		ND	0.00050	mg/l
Pyrene		ND	0.00050	mg/l
1,2,4-Trichlorobenzene		ND	0.00050	mg/l
2,4,5-Trichlorophenol		ND	0.00050	mg/l
2,4,6-Trichlorophenol		ND	0.00050	mg/l

Laboratory Control Sample (LCS)

Lab Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:04, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acenaphthene		74.0	27	111
Acenaphthylene		68.1	16	116
Anthracene		74.8	31	119
Benzo(a)anthracene		78.1	35	119
Benzo(b)fluoranthene		83.4	27	129
Benzo(k)fluoranthene		80.1	36	120
Benzo(ghi)perylene		71.1	31	126
Benzo(a)pyrene		89.1	32	121
bis(2-Chloroethoxy)methane		75.1	23	106
bis(2-Chloroethyl)ether		68.5	29	94
bis(2-Chloroisopropyl)ether		71.1	23	91
bis(2-Ethylhexyl)phthalate		81.6	35	121
4-Bromophenyl phenyl ether		74.8	27	122
Butyl benzyl phthalate		85.1	36	117

QC Report - Batch QC Results

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:04, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
4-Chloroaniline		43.4	19	91
2-Chloronaphthalene		70.0	21	109
4-Chloro-3-methylphenol		71.5	36	105
2-Chlorophenol		61.1	24	94
4-Chlorophenyl phenyl ether		76.5	31	114
Chrysene		78.7	34	119
3-, 4-Methylphenol (p,m-Cresol)		52.2	21	90
2-Methylphenol (o-Cresol)		54.6	23	79
Dibenzo(ah)anthracene		72.2	32	119
Dibenzofuran		75.9	29	115
di-n-Butyl phthalate		77.2	34	121
1,2-Dichlorobenzene		53.5	11	88
1,3-Dichlorobenzene		49.6	10	85
1,4-Dichlorobenzene		50.5	10	85
3,3'-Dichlorobenzidine		51.8	27	110
2,4-Dichlorophenol		73.0	33	106
Diethyl phthalate		80.2	36	116
2,4-Dimethylphenol		70.9	30	105
Dimethyl phthalate		79.4	35	116
4,6-Dinitro-2-methylphenol		74.9	19	116
2,4-Dinitrophenol		62.8	10	125
2,4-Dinitrotoluene		78.7	33	119
2,6-Dinitrotoluene		76.4	34	117
1,2-Diphenylhydrazine		74.7	34	113
di-n-Octyl phthalate		92.9	30	133
Fluoranthene		79.9	35	121
Fluorene		78.3	32	114
Hexachlorobenzene		69.2	26	126
Hexachlorobutadiene		52.5	10	95
Hexachlorocyclopentadiene		17.2	10	90
Hexachloroethane		48.0	10	82
Indeno(1,2,3-cd)pyrene		72.5	31	124
Isophorone		59.1	26	104
2-Methylnaphthalene		68.2	21	103
Naphthalene		65.7	21	99
2-Nitroaniline		74.1	34	111
3-Nitroaniline		51.9	34	111
4-Nitroaniline		56.5	34	100
Nitrobenzene		91.5	30	98
2-Nitrophenol		74.0	31	108
4-Nitrophenol		39.2	10	90
N-Nitrosodiphenylamine		60.3	31	120
N-Nitrosodi-n-propylamine		73.8	33	102
Pentachlorophenol		76.3	10	108
Phenanthrene		77.6	35	113
Phenol		27.1	10	43

QC Report - Batch QC Results

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:04, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Pyrene		82.4	33	120
1,2,4-Trichlorobenzene		56.6	10	98
2,4,5-Trichlorophenol		78.3	31	120
2,4,6-Trichlorophenol		79.1	31	114

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: P221109B.LCSDW08A, Parent Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:36, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acenaphthene		72.3	27	111	2.2	30.0
Acenaphthylene		68.2	16	116	0.1	30.0
Anthracene		74.7	31	119	0.1	30.0
Benzo(a)anthracene		79.3	35	119	1.5	30.0
Benzo(b)fluoranthene		83.7	27	129	0.3	30.0
Benzo(k)fluoranthene		79.8	36	120	0.4	30.0
Benzo(ghi)perylene		69.8	31	126	1.8	30.0
Benzo(a)pyrene		87.2	32	121	2.1	30.0
bis(2-Chloroethoxy)methane		74.0	23	106	1.4	30.0
bis(2-Chloroethyl)ether		67.4	29	94	1.5	30.0
bis(2-Chloroisopropyl)ether		70.7	23	91	0.5	30.0
bis(2-Ethylhexyl)phthalate		82.8	35	121	1.4	30.0
4-Bromophenyl phenyl ether		75.5	27	122	0.9	30.0
Butyl benzyl phthalate		86.5	36	117	1.7	30.0
4-Chloroaniline		43.2	19	91	0.5	30.0
2-Chloronaphthalene		70.3	21	109	0.4	30.0
4-Chloro-3-methylphenol		71.6	36	105	0.2	30.0
2-Chlorophenol		59.5	24	94	2.8	30.0
4-Chlorophenyl phenyl ether		75.0	31	114	2.1	30.0
Chrysene		80.8	34	119	2.7	30.0
3-, 4-Methylphenol (p,m-Cresol)		50.5	21	90	3.3	30.0
2-Methylphenol (o-Cresol)		53.5	23	79	2.1	30.0
Dibenzo(ah)anthracene		70.1	32	119	2.8	30.0
Dibenzofuran		74.0	29	115	2.5	30.0
di-n-Butyl phthalate		78.4	34	121	1.6	30.0
1,2-Dichlorobenzene		52.3	11	88	2.2	30.0
1,3-Dichlorobenzene		49.0	10	85	1.2	30.0
1,4-Dichlorobenzene		50.5	10	85	0.2	30.0
3,3'-Dichlorobenzidine		53.3	27	110	2.9	30.0
2,4-Dichlorophenol		73.9	33	106	1.3	30.0
Diethyl phthalate		77.9	36	116	2.9	30.0
2,4-Dimethylphenol		70.2	30	105	1.0	30.0
Dimethyl phthalate		77.1	35	116	3.0	30.0
4,6-Dinitro-2-methylphenol		74.9	19	116	0.0	30.0
2,4-Dinitrophenol		62.0	10	125	1.2	30.0
2,4-Dinitrotoluene		77.1	33	119	2.1	30.0
2,6-Dinitrotoluene		76.9	34	117	0.7	30.0

QC Report - Batch QC Results

Organics - Semi-Volatiles, Prep Batch ID: SF221108W1 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: P221109B.LCSDW08A, Parent Sample ID: P221109B.LCSW08A

Run in Batch: P221109B, Run Date: 11/09/2022 20:36, Prep Date: 11/08/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,2-Diphenylhydrazine		78.3	34	113	4.8	30.0
di-n-Octyl phthalate		93.1	30	133	0.2	30.0
Fluoranthene		80.3	35	121	0.5	30.0
Fluorene		77.5	32	114	0.9	30.0
Hexachlorobenzene		71.7	26	126	3.6	30.0
Hexachlorobutadiene		50.5	10	95	3.8	30.0
Hexachlorocyclopentadiene		16.7	10	90	2.5	30.0
Hexachloroethane		47.7	10	82	0.7	30.0
Indeno(1,2,3-cd)pyrene		71.5	31	124	1.4	30.0
Isophorone		58.6	26	104	0.8	30.0
2-Methylnaphthalene		67.4	21	103	1.3	30.0
Naphthalene		63.2	21	99	3.9	30.0
2-Nitroaniline		72.2	34	111	2.7	30.0
3-Nitroaniline		51.8	34	111	0.1	30.0
4-Nitroaniline		56.0	34	100	0.7	30.0
Nitrobenzene		90.3	30	98	1.4	30.0
2-Nitrophenol		73.5	31	108	0.7	30.0
4-Nitrophenol		38.3	10	90	2.3	30.0
N-Nitrosodiphenylamine		62.4	31	120	3.5	30.0
N-Nitrosodi-n-propylamine		73.2	33	102	0.7	30.0
Pentachlorophenol		74.4	10	108	2.5	30.0
Phenanthrene		76.4	35	113	1.5	30.0
Phenol		27.1	10	43	0.1	30.0
Pyrene		83.3	33	120	1.1	30.0
1,2,4-Trichlorobenzene		56.4	10	98	0.4	30.0
2,4,5-Trichlorophenol		75.5	31	120	3.7	30.0
2,4,6-Trichlorophenol		78.4	31	114	1.0	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF221104W4

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221104C9.BLKW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 01:22, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Diethyl ether		ND	1.00	ug/l
Acetone		ND	10.00	ug/l
Methyl iodide		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Chloroform		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
2-Hexanone		ND	10.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Benzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Toluene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF221104W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK) (continued)

Lab Sample ID: 221104C9.BLKW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 01:22, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Bromoform		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Hexachloroethane		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
Naphthalene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:04, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Diethyl ether		97.5	67.4	121.2
Acetone		81.0	29.9	161.5
Methyl iodide		97.6	68.8	116.4
Carbon disulfide		90.4	63.8	137.4
tert-Methyl butyl ether (MTBE)		90.8	73.2	122.4
Acrylonitrile		98.5	69.9	128.9
2-Butanone (MEK)		88.2	44.0	134.4
Dichlorodifluoromethane		105.4	10.0	222.8
Chloromethane		109.2	23.8	166.5
Vinyl chloride		105.9	43.5	149.1
Bromomethane		103.6	56.8	151.3
Chloroethane		96.1	53.4	149.4
Trichlorofluoromethane		97.4	59.7	151.8
1,1-Dichloroethene		91.3	69.6	139.4
Methylene chloride		98.7	73.3	121.1
trans-1,2-Dichloroethene		94.7	73.6	129.3
1,1-Dichloroethane		96.6	71.5	126.2
cis-1,2-Dichloroethene		98.1	76.6	122.1
Tetrahydrofuran		88.1	59.0	117.9
Chloroform		98.2	78.4	124.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF221104W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:04, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Bromochloromethane		101.3	78.2	120.8
1,1,1-Trichloroethane		92.4	79.4	130.9
4-Methyl-2-pentanone (MIBK)		90.0	71.6	125.2
2-Hexanone		89.2	55.4	136.9
Carbon tetrachloride		88.4	72.6	133.0
Benzene		95.3	79.9	124.9
1,2-Dichloroethane		96.2	76.0	126.3
Trichloroethene		92.3	79.7	124.2
1,2-Dichloropropane		97.6	78.6	126.4
Bromodichloromethane		95.8	80.4	128.2
Dibromomethane		99.5	76.9	122.1
cis-1,3-Dichloropropene		96.7	79.8	129.9
Toluene		92.8	79.8	124.5
trans-1,3-Dichloropropene		95.8	74.0	131.3
1,1,2-Trichloroethane		97.4	78.7	123.1
Tetrachloroethene		94.2	74.5	124.5
trans-1,4-Dichloro-2-butene		95.9	68.6	135.4
Dibromochloromethane		100.3	74.6	127.2
1,2-Dibromoethane		100.8	70.3	133.7
Chlorobenzene		100.1	79.2	122.7
1,1,1,2-Tetrachloroethane		98.8	80.3	128.2
Ethylbenzene		97.8	79.5	129.1
p,m-Xylene		97.6	79.4	132.2
o-Xylene		95.3	80.2	131.0
Styrene		100.1	69.5	126.7
Isopropylbenzene		95.2	74.4	121.5
Bromoform		98.1	69.4	128.0
1,1,2,2-Tetrachloroethane		100.4	79.8	126.3
1,2,3-Trichloropropane		102.4	78.3	138.8
n-Propylbenzene		96.0	82.0	130.7
Bromobenzene		101.9	78.7	124.6
1,3,5-Trimethylbenzene		95.7	81.3	128.9
tert-Butylbenzene		90.6	80.7	128.9
1,2,4-Trimethylbenzene		98.2	81.4	130.8
sec-Butylbenzene		88.6	77.4	129.8
p-Isopropyltoluene		90.4	79.8	137.5
1,3-Dichlorobenzene		95.8	77.0	131.3
1,4-Dichlorobenzene		96.5	20.7	137.7
1,2-Dichlorobenzene		97.8	10.0	166.2
1,2,3-Trimethylbenzene		91.5	76.3	124.2
n-Butylbenzene		89.2	80.0	133.3
Hexachloroethane		82.5	23.8	138.1
1,2-Dibromo-3-chloropropane		84.8	21.2	189.4
1,2,4-Trichlorobenzene		92.9	27.4	143.4
1,2,3-Trichlorobenzene		90.9	75.4	131.4
Naphthalene		86.1	32.9	135.8

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF221104W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:04, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
2-Methylnaphthalene		70.6	25.5	165.5

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221104C9.LCSDW04B, Parent Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:23, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Diethyl ether		92.2	67.4	121.2	5.5	30.0
Acetone		79.0	29.9	161.5	2.4	30.0
Methyl iodide		93.6	68.8	116.4	4.2	30.0
Carbon disulfide		86.8	63.8	137.4	4.1	30.0
tert-Methyl butyl ether (MTBE)		87.1	73.2	122.4	4.2	30.0
Acrylonitrile		94.7	69.9	128.9	3.9	30.0
2-Butanone (MEK)		86.2	44.0	134.4	2.3	30.0
Dichlorodifluoromethane		101.9	10.0	222.8	3.4	30.0
Chloromethane		100.4	23.8	166.5	8.4	30.0
Vinyl chloride		101.5	43.5	149.1	4.3	30.0
Bromomethane		97.9	56.8	151.3	5.7	30.0
Chloroethane		92.4	53.4	149.4	3.9	30.0
Trichlorofluoromethane		92.9	59.7	151.8	4.8	30.0
1,1-Dichloroethene		87.1	69.6	139.4	4.7	30.0
Methylene chloride		93.7	73.3	121.1	5.2	30.0
trans-1,2-Dichloroethene		89.4	73.6	129.3	5.8	30.0
1,1-Dichloroethane		91.7	71.5	126.2	5.2	30.0
cis-1,2-Dichloroethene		93.8	76.6	122.1	4.5	30.0
Tetrahydrofuran		85.3	59.0	117.9	3.2	30.0
Chloroform		93.5	78.4	124.0	4.8	30.0
Bromochloromethane		98.4	78.2	120.8	2.9	30.0
1,1,1-Trichloroethane		87.5	79.4	130.9	5.4	30.0
4-Methyl-2-pentanone (MIBK)		84.8	71.6	125.2	5.9	30.0
2-Hexanone		85.0	55.4	136.9	4.9	30.0
Carbon tetrachloride		87.2	72.6	133.0	1.4	30.0
Benzene		91.7	79.9	124.9	3.8	30.0
1,2-Dichloroethane		92.7	76.0	126.3	3.7	30.0
Trichloroethene		90.3	79.7	124.2	2.2	30.0
1,2-Dichloropropane		94.3	78.6	126.4	3.5	30.0
Bromodichloromethane		94.0	80.4	128.2	2.0	30.0
Dibromomethane		98.3	76.9	122.1	1.2	30.0
cis-1,3-Dichloropropene		95.3	79.8	129.9	1.5	30.0
Toluene		91.1	79.8	124.5	1.8	30.0
trans-1,3-Dichloropropene		91.5	74.0	131.3	4.5	30.0
1,1,2-Trichloroethane		95.2	78.7	123.1	2.3	30.0
Tetrachloroethene		91.1	74.5	124.5	3.3	30.0
trans-1,4-Dichloro-2-butene		91.9	68.6	135.4	4.2	30.0
Dibromochloromethane		99.2	74.6	127.2	1.1	30.0
1,2-Dibromoethane		100.4	70.3	133.7	0.4	30.0
Chlorobenzene		98.1	79.2	122.7	2.0	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF221104W4 (continued)

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 221104C9.LCSDW04B, Parent Sample ID: 221104C9.LCSW04B

Run in Batch: 221104C9, Run Date: 11/05/2022 00:23, Prep Date: 11/04/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,1,1,2-Tetrachloroethane		96.3	80.3	128.2	2.5	30.0
Ethylbenzene		93.9	79.5	129.1	4.0	30.0
p,m-Xylene		96.4	79.4	132.2	1.3	30.0
o-Xylene		93.9	80.2	131.0	1.5	30.0
Styrene		96.6	69.5	126.7	3.6	30.0
Isopropylbenzene		93.4	74.4	121.5	1.9	30.0
Bromoform		95.6	69.4	128.0	2.6	30.0
1,1,2,2-Tetrachloroethane		98.2	79.8	126.3	2.2	30.0
1,2,3-Trichloropropane		98.0	78.3	138.8	4.5	30.0
n-Propylbenzene		93.8	82.0	130.7	2.3	30.0
Bromobenzene		97.9	78.7	124.6	3.9	30.0
1,3,5-Trimethylbenzene		95.0	81.3	128.9	0.7	30.0
tert-Butylbenzene		88.6	80.7	128.9	2.1	30.0
1,2,4-Trimethylbenzene		94.7	81.4	130.8	3.7	30.0
sec-Butylbenzene		90.3	77.4	129.8	2.0	30.0
p-Isopropyltoluene		91.5	79.8	137.5	1.2	30.0
1,3-Dichlorobenzene		96.4	77.0	131.3	0.6	30.0
1,4-Dichlorobenzene		97.5	20.7	137.7	1.1	30.0
1,2-Dichlorobenzene		99.0	10.0	166.2	1.3	30.0
1,2,3-Trimethylbenzene		92.1	76.3	124.2	0.6	30.0
n-Butylbenzene		90.6	80.0	133.3	1.5	30.0
Hexachloroethane		85.0	23.8	138.1	3.0	30.0
1,2-Dibromo-3-chloropropane		88.8	21.2	189.4	4.7	30.0
1,2,4-Trichlorobenzene		93.9	27.4	143.4	1.1	30.0
1,2,3-Trichlorobenzene		89.9	75.4	131.4	1.2	30.0
Naphthalene		86.9	32.9	135.8	0.9	30.0
2-Methylnaphthalene		68.6	25.5	165.5	3.0	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VS221111W1

Surrogates: Yes, QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 221111B9.BLKW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 20:26, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
1,4-Dioxane	*	0.47	0.02	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:04, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,4-Dioxane		83.0	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 221111B9.LCSDW11A, Parent Sample ID: 221111B9.LCSW11A

Run in Batch: 221111B9, Run Date: 11/11/2022 19:25, Prep Date: 11/11/2022, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
1,4-Dioxane		85.9	70.0	130.0	3.4	30.0

Merit Laboratories Login Checklist

Lab Set ID:S42114

Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30112892.0470B / Racer Lansing

Submitted: 11/03/2022 08:15 Login User: MMC

Attention: Kaitlyn Hunt

Address: Arcadis
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O:248-809-4013 FAX:

Email: Kaitlyn.Hunt@arcadis.com

Selection	Description	Note
Sample Receiving		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
Preservation		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

