

MEMO

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Vapor Intrusion Sampling – 1ST Quarterly Sampling Event - February 2021 (Winter) Sampling

Date April 29, 2021

Ramboll Americas Engineering Solutions (Ramboll), on behalf of the Revitalizing Auto Communities Environmental Response Trust (RACER Trust) is providing this technical memorandum to summarize the vapor probe sampling results collected on February 22, 2021 and February 23, 2021 in relation to the RACER Trust Coldwater Road Facility (Site) located in Flint, Michigan ([Figure 1](#)).

The sampling was performed in response to the Michigan Department of Environment, Great Lakes, and Energy’s (EGLE’s) December 23, 2020 letter titled, *Review: Vapor Intrusion Technical Memo* and the subsequent January 14, 2021 response letter prepared by Ramboll regarding *Comments on Vapor Intrusion Technical Memo-Letter Dated December 23, 2020* to further evaluate potential volatilization to indoor air pathway concerns.

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1 Sampling & Analysis

Sample collection activities were completed on February 22, 2021 and February 23, 2021 in accordance with the EGLE approved scope of work in the Ramboll response letter.

Soil gas grab samples were attempted from vapor probes VP-1S, VP-1D, VP-2S, VP-2D, VP-3S, VP-3M, VP-3D, VP-5S, VP-5M, VP-5D, VP-6S, VP-6M, and VP-6D. See [Figure 2](#) for soil gas probe locations and [Figure 3](#) for geologic cross-sections of the area.

During this sampling event, vapor probes VP-4S/M/D were not located after multiple attempts to locate the protective road box by hand digging in the area. An additional attempt to locate the vapor probes was made on March 11, 2021 once the ground thawed and the snow had melted. It was revealed that the road box and probes had been destroyed during waterline improvement activities in the area. Further discussion with EGLE will be needed to determine how best to proceed for future sampling events. However, the need to replace these vapor

probes is uncertain in our assessment because all three of these probes have been flooded each time they were to be sampled. Groundwater samples were collected from each of the probes in November 2019 (i.e., the last time they were sampled) and no volatile organic compounds (VOCs) were detected in the samples.

Successful soil gas grab samples were collected from vapor probes VP-2D, VP-3S, VP-5S, VP-5M, and VP-5D.

Groundwater samples for VOCs were collected in lieu of vapor samples when groundwater was encountered in any of the soil gas probes. Groundwater samples were collected at vapor probes VP-1S, VP-1D, VP-2S, VP-3M, VP-3D, VP-6S, and VP-6M.

While attempting to collect a soil gas grab sample from VP-6D, the first grab sample attempt stalled due to interference from groundwater and no sample was collected. As recommended in the work plan, a second soil gas sample was attempted using a flow controller calibrated to a lower flow rate of 8-hour sample time or 2 milliliters per minute flow rate. No sample was collected from the 8-hour sample attempt as the pressure only dropped 1 pound per square inch (PSI) over the eight hours. A groundwater sample was attempted twice from VP-6D, but no sample could be collected.

1.1 Sample Procedure

Prior to the collection of the soil vapor samples, the sample tubing was purged of ambient air. A minimum of three volumes of air within the sample probe and tubing were purged prior to sample collection. In addition, helium tracer gas screening was used during sampling of the soil vapor probes to evaluate the adequacy of the sampling technique and identify potential short-circuiting from the ground surface during sample collection.

A MGD 2002 gas leak detector was used to screen the extracted vapor stream for helium prior to and after sample collection. No olfactory observations were recognized during probe installation and sampling. Short-circuiting was observed during the initial screening at VP-2D and VP-3S. Prior to sampling hydrated granular bentonite was packed around the interior and exterior of the well protector to seal the soil vapor probes. Short-circuiting was observed in vapor probe VP-3S during the final screening after completion of sampling with a helium concentration of 25 parts per million by volume (ppmv). Due to the short-circuiting at VP-3S, we suggest resetting the road box and replacing the bentonite to a depth of one foot below grade. See [Appendix A](#) for Soil Vapor (Bottle Vac®) Sample Collection Field Forms.

The soil gas samples were collected in Bottle Vacs® and transported to the laboratory under appropriate chain-of-custody (COC) protocols. The soil gas samples were submitted to Merit Laboratories in East Lansing, Michigan a National Environmental Laboratory Accreditation Conference (NELAC)-certified laboratory for analysis by USEPA Method TO-15. For quality control purposes, a field duplicate sample (DUP-1) was collected from the VP-3S vapor probe location.

1.2 Analytical Results

The analytical results for the samples collected at the Coldwater Road Landfill facility are presented in [Table 1](#) and [Table 2](#) and discussed below. The complete analytical laboratory report is contained in [Appendix B](#).

To establish a more accurate criteria for comparison at the Site, a site-specific volatilization to indoor air criteria (SSVIAC) under Part 201 or site-specific screening levels (SSTLs) under Part 201 of the Natural Resources and Environmental Protection Act, 1994 PA 451 as amended were calculated and provided by

EGLE in a October 22, 2020 email. The site-specific criteria and transmittal letter are provided in [Appendix C](#).

During this sampling event benzene was detected at a concentration of 9.6 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) at VP-2D, which is above the most stringent EGLE Residential SSVIAC Criteria - Table 1 (crawl space with a dirt floor) criteria of $3.3 \mu\text{g}/\text{m}^3$. Tetrahydrofuran was detected at VP-2D ($21 \mu\text{g}/\text{m}^3$), VP-3S and duplicate from VP-3S ($12 \mu\text{g}/\text{m}^3$), and VP-5D ($8.8 \mu\text{g}/\text{m}^3$). The detections for tetrahydrofuran were below the most stringent EGLE Residential SSVIAC Criteria - Table 1 (crawl space with a dirt floor) criteria of $2,100 \mu\text{g}/\text{m}^3$. The duplicate sample from VP-3S (Dup-1) was within acceptable relative percent difference (RPD) criteria for the detection of tetrahydrofuran. The two remaining vapor (i.e., soil gas) samples from VP-5S and VP-5M were non-detect for VOCs.

From the seven groundwater samples collected (VP-1S, VP-1D, VP-2S, VP-3M, VP-3D, VP-6S, and VP-6M) no VOCs were detected above the laboratory reporting limit. See [Table 2](#) for groundwater VOCs analytical results.

2 Summary

During this sampling event VOC concentrations were generally comparable to past results for the soil gas samples that were able to be collected. Benzene was detected above the SSVIAC criteria at VP-2D and there were some exceedances of SSVIAC criteria during previous sampling events, but even these exceedances have not been consistently detected. The groundwater VOC results from flooded vapor probes continue to not identify detections above the laboratory reporting limit.

The existing vapor probes will be re-sampled during the next sampling event currently scheduled to occur in May 2021 to evaluate whether transient and environmental influences significantly affect subsurface VOC concentrations.

If you have any questions regarding this technical memorandum, please contact Cliff Yantz at (313) 333-0211.

Very truly yours,

RAMBOLL AMERICAS ENGINEERING SOLUTIONS, INC.



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Enclosures:

Tables

Table 1 – Vapor Intrusion Analytical Results – December 2017, June 2018, October 2018, November 2019, February 2021

Table 2 – Groundwater VOCs Analytical Results – November 2019, February 2021

Figures

Figure 1 – Site Location Map

Figure 2 – Sample Location Map

Figure 3 – Cross Sections

Appendices

Appendix A – Soil Vapor (Bottle Vac®) Sample Collection Field Forms

Appendix B – Analytical Laboratory Results

Appendix C – Site-specific VIAC Criteria & Transmittal Letter

TABLES



TABLE 1
RACER Trust - Coldwater Road
Vapor Intrusion Sampling - Detections
Soil Vapor Results December 2017 through February 2021

Compound	Sample ID: Units:	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria-Table 1 (crawl-space with a dirt floor)	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria-Table 2 & 3 (slab-on-grade & basement)	VP-1S	VP-1S	VP-1S	VP-1S	VP-1S (VP-DUP-1)	VP-1D	VP-2S	VP-2S (VP-DUP-1)	VP-2S	VP-2S
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Sample Date:				12/8/2017	6/29/2018	6/29/2018	11/19/2019	11/19/2019	12/8/2017	12/8/2017	12/8/2017	6/29/2018	11/18/2019
Acetone	NA	NA	NA	<48	48	<48	<48	<48	95	<48	<48	<48	<48
Benzene	3.3 ca	110 ca	110 ca	<6.4	9.6	<6.4	<6.4	<6.4	13	<6.4	<6.4	<6.4	<6.4
Carbon Disulfide	NA	NA	NA	<16	37	22	<16	<16	<16	<16	<16	<16	<16
Chloroform	NA	NA	NA	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8
Cyclohexane	6,300 nc	2.1E+05 nc	2.1E+05 nc	<6.9	14	10	<6.9	<6.9	17	<6.9	<6.9	<6.9	<6.9
1,2-Dichloroethane	0.98 ca	33 ca	33 ca	85	<8.1	<8.1	<8.1	<8.1	130	8.1	12	<8.1	<8.1
Ethanol	19,000 (EE) st	6.3E+05 (EE) st	6.3E+05 (EE) st	<64 X	<57 X	<47	<47	<47	<130 X	<47	<47	<47	<47
Ethylbenzene	10 ca	340 ca	340 ca	<8.7	13	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	8.7	<8.7
Heptane	3,700 nc	1.2E+05 nc	1.2E+05 nc	<8.2	25	<8.2	<8.2	<8.2	12	<8.2	<8.2	12	<8.2
Hexane	730 nc	24,000 nc	24,000 nc	56	74	49	11	7	130	<7.0	<7.0	14	<7.0
Isopropyl Alcohol	210 nc	7,000 nc	7,000 nc	370	<49	<49	<49	<49	590	49	74	<49	<49
Methylene Chloride	NA	NA	NA	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17
2-Butanone (MEK)	5,000 (DD) dev	1.7E+05 (DD) dev	1.7E+05 (DD) dev	<29	<29	<29	<29	<29	<29	<29	<29	<29	<29
Propylene	NA	NA	NA	618	<262 X	<186 X	<6.9 X	<6.9 X	303	<3.4	<3.4	<3.4	<3.4
1,2,4-Trimethylbenzene	63 (JT) nc	2,100 (JT) nc	2,100 (JT) nc	<37	25	15	<9.8	<9.8	<9.8	<9.8	<9.8	15	<9.8
2,2,4-Trimethylpentane	3,700 nc	1.2E+05 nc	1.2E+05 nc	9.3	47	28	<9.3	<9.3	37	<9.3	<9.3	14	<9.3
Tert-butyl Alcohol	NA	NA	NA	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Tetrachloroethene	41 (EE) st	1,400 (EE) st	1,400 (EE) st	27	<14	<14	<14	<14	<14	<14	<14	<14	<14
Tetrahydrofuran	2,100 nc	70,000 nc	70,000 nc	<5.9	27	18	8.8	8.8	<5.9	<5.9	<5.9	24	18
Toluene	5,200 nc	1.7E+05 nc	1.7E+05 nc	34	57	41	11	11	57	<7.5	<7.5	41	<7.5
Trichloroethene	2.0 (DD) dev	67 (DD) dev	67 (DD) dev	<11	43	91	<11	<11	<11	<11	<11	32	<11
p,m-Xylene	NA	NA	NA	<17	39	22	<17	<17	22	<17	<17	30	<17
o-Xylene	NA	NA	NA	<8.7	17	8.7	<8.7	<8.7	<8.7	<8.7	<8.7	13	<8.7
Total Xylene	230 (J)	7,600 (J) nc	7,600 (J) nc	<26	56	30	<26	<26	<26	<26	<26	43	<26

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TABLE 1
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Compound	Sample ID: Units:	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria- Table 1 (crawlspce with a dirt floor)	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria- Table 2 & 3 (slab-on-grade & basement)	VP-2D µg/m ³	VP-2D µg/m ³	VP-3S µg/m ³	VP-3S µg/m ³	VP-3S µg/m ³	VP-3S (DUP-1) µg/m ³	VP-3D µg/m ³	VP-5S µg/m ³	VP-5S (DUP-1) µg/m ³	VP-5S µg/m ³	VP-5S µg/m ³
		µg/m ³	µg/m ³	11/18/2019	2/22/2021	6/29/2018	11/19/2019	2/22/2021	2/22/2021	6/29/2018	10/25/2018	10/25/2018	11/18/2019	2/22/2021
Acetone		NA	NA	<48	<48	48	<48	<48	<48	570	<48	<48	71	<48
Benzene		3.3 ca	110 ca	<6.4	9.6	16	<6.4	<6.4	<6.4	16	<6.4	<6.4	<6.4	<6.4
Carbon Disulfide		NA	NA	<16	<16	56	<16	<16	<16	40	75	78	<16	<16
Chloroform		NA	NA	<9.8	<9.8	15	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8
Cyclohexane		6,300 nc	2.1E+05 nc	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9	6.9	<6.9	<6.9	<6.9	<6.9
1,2-Dichloroethane		0.98 ca	33 ca	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1
Ethanol		19,000 (EE) st	6.3E+05 (EE) st	<47	<230	<47	<47	<230	<230	2,116 E	<47	<47	89	<230
Ethylbenzene		10 ca	340 ca	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	130	<8.7	<8.7	<8.7	<8.7
Heptane		3,700 nc	1.2E+05 nc	<8.2	<8.2	16	<8.2	<8.2	<8.2	25	<8.2	<8.2	<8.2	<8.2
Hexane		730 nc	24,000 nc	<7.0	<7.0	25	<7.0	<7.0	<7.0	63	7.0	7.0	<7.0	<7.0
Isopropyl Alcohol		210 nc	7,000 nc	<49	<49	<49	<49	<49	<49	170	<49	<49	<49	<49
Methylene Chloride		NA	NA	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17	<17
2-Butanone (MEK)		5,000 (DD) dev	1.7E+05 (DD) dev	<29	<59	<29	<29	<59	<59	59	<29	<29	<29	<59
Propylene		NA	NA	<3.4	<170	<21 X	<3.4	<170	<170	1,800 E	<8.6 X	<6.9 X	<91 X	<170
1,2,4-Trimethylbenzene		63 (JT) nc	2,100 (JT) nc	<9.8	<9.8	15	<9.8	<9.8	<9.8	<37	<9.8	<9.8	<9.8	<9.8
2,2,4-Trimethylpentane		3,700 nc	1.2E+05 nc	<9.3	<9.3	14	<9.3	<9.3	<9.3	28	<9.3	<9.3	<9.3	<9.3
Tert-butyl Alcohol		NA	NA	<30	<30	<30	<30	<30	<30	120	<30	<30	<30	<30
Tetrachloroethene		41 (EE) st	1,400 (EE) st	<14	<14	<14	<14	<14	<14	<14	<14	<14	<14	<14
Tetrahydrofuran		2,100 nc	70,000 nc	12	21	15	8.8	12	12	8.8	12	12	44	<5.9
Toluene		5,200 nc	1.7E+05 nc	<7.5	<7.5	49	11	<7.5	<7.5	60	38	38	11	<7.5
Trichloroethene		2.0 (DD) dev	67 (DD) dev	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11	<11
p,m-Xylene		NA	NA	<17	<17	30	<17	<17	<17	380	<17	<17	<17	<17
o-Xylene		NA	NA	<8.7	<8.7	13	<8.7	<8.7	<8.7	96	<8.7	<8.7	<8.7	<8.7
Total Xylene		230 (J)	7,600 (J) nc	<26	<26	43	<26	<26	<26	480	<26	<26	<26	<26

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Compound	Sample ID: Units:	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria- Table 1 (crawlspce with a dirt floor)	EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria- Table 2 & 3 (slab-on-grade & basement)	VP-5M	VP-5M	VP-5M	VP-5D	VP-5D	VP-6S	VP-6M	VP-6D	VP-6D
		µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³	µg/m ³
Sample Date:				10/25/2018	11/18/2019	2/22/2021	11/18/2019	2/22/2021	10/25/2018	10/25/2018	10/25/2018	11/18/2019
Acetone		NA	NA	<48	<48	<48	<48	<48	<48	<48	<48	95
Benzene	3.3 ca	110 ca	110 ca	9.6	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4	<6.4
Carbon Disulfide	NA	NA	NA	290	<16	<16	<16	<16	140	250	<16	<16
Chloroform	NA	NA	NA	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8
Cyclohexane	6,300 nc	2.1E+05 nc	2.1E+05 nc	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9	<6.9
1,2-Dichloroethane	0.98 ca	33 ca	33 ca	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1	<8.1
Ethanol	19,000 (EE) st	6.3E+05 (EE) st	6.3E+05 (EE) st	<47	<47	<230	<47	<230	<47	<47	<47	85
Ethylbenzene	10 ca	340 ca	340 ca	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7
Heptane	3,700 nc	1.2E+05 nc	1.2E+05 nc	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2	<8.2
Hexane	730 nc	24,000 nc	24,000 nc	18	<7.0	<7.0	<7.0	<7.0	11	<7.0	<7.0	49
Isopropyl Alcohol	210 nc	7,000 nc	7,000 nc	<49	<49	<49	<49	<49	<49	<49	<49	<49
Methylene Chloride	NA	NA	NA	<17	<17	<17	<17	<17	<17	<17	<17	28
2-Butanone (MEK)	5,000 (DD) dev	1.7E+05 (DD) dev	1.7E+05 (DD) dev	<29	<29	<59	<29	<59	<29	<29	<29	<29
Propylene	NA	NA	NA	<62 X	<6.9 X	<170	<3.4	<170	<15 X	<12 X	<3.9	12
1,2,4-Trimethylbenzene	63 (JT) nc	2,100 (JT) nc	2,100 (JT) nc	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8	<9.8
2,2,4-Trimethylpentane	3,700 nc	1.2E+05 nc	1.2E+05 nc	14	<9.3	<9.3	<9.3	<9.3	<9.3	<9.3	<9.3	<9.3
Tert-butyl Alcohol	NA	NA	NA	<30	<30	<30	<30	<30	<30	<30	<30	<30
Tetrachloroethene	41 (EE) st	1,400 (EE) st	1,400 (EE) st	<14	<14	<14	<14	<14	<14	<14	<14	<14
Tetrahydrofuran	2,100 nc	70,000 nc	70,000 nc	15	27	<5.9	15	8.8	12	8.8	5.9	29
Toluene	5,200 nc	1.7E+05 nc	1.7E+05 nc	45	<7.5	<7.5	<7.5	<7.5	19	15	11	23
Trichloroethene	2.0 (DD) dev	67 (DD) dev	67 (DD) dev	<11	<11	<11	<11	<11	<11	<11	<11	<11
p,m-Xylene	NA	NA	NA	22	<17	<17	<17	<17	<17	<17	<17	<17
o-Xylene	NA	NA	NA	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7	<8.7
Total Xylene	230 (J)	7,600 (J) nc	7,600 (J) nc	<26	<26	<26	<26	<26	<26	<26	<26	<26

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TABLE 1
RACER Trust - Coldwater Road
Vapor Intrusion Sampling - Detections
Soil Vapor Results December 2017 through February 2021

Notes

- 1) Concentrations above the EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria Table 1 (crawl space with a dirt floor) are highlighted in yellow.
- 2) Concentrations above both the EGLE Site-Specific Residential Volatilization to Indoor Air (VIAC) Criteria Table 1 (crawl space with a dirt floor) and Table 2 & 3 (slab-on-grade & basement) are highlighted in orange.
- 3) Concentrations in $\mu\text{g}/\text{m}^3$ as noted
- 4) Detections highlighted in bold.
- 5) < = Not detected at specified reporting limit.
- 6) DUP = Duplicate sample.
- 7) NA = means not available.
- 8) Light gray header is most recent sampling event result.
- 9) Acceptable Air Values (AAV) endpoint basis used for site-specific criterion: (ca) = Carcinogenic; (nc) = Non-Carcinogenic; (dev) = Developmental; (mut) = Mutagenic cancer; (st) = Short-term (i.e., less than chronic exposure): Agency for Toxic Substances and Disease Registry Inhalation Minimum Risk Level for Acute Inhalation or Intermediate Inhalation exposure durations; U.S. Environmental Protection Agency Integrated Risk Information System Reference Concentration for short-term exposure; of Air Quality Division Acute Initial Threshold Screening Level.
- 10) DD = 'Hazardous substance causes developmental effects. Residential SSVIAC are protective of both prenatal exposure using a pregnant female receptor and postnatal exposure using a child receptor. Nonresidential SSVIAC are protective of prenatal exposure using a pregnant female receptor. Prenatal developmental effects may occur after an acute (i.e. short-term) or full-term exposure.
- 11) E = Concentration exceeds calibration range.
- 12) EE = The acceptable air concentration (AAC) for the volatile hazardous substances is not derived using standard equations. The hazardous substance may cause adverse human health effects for less than chronic exposures (i.e. short-term or acute). The AAC for these hazardous substances is the acute or intermediate minimum risk level (MRL) developed by the Agency for Toxic Substances and Disease Registry (ATSDR), a United States Environmental Protection Agency Integrated Risk Information System (IRIS) acute reference concentration, or an acute initial threshold screening level (ITSL) by the EGLE's Air Quality Division.
- 13) J = Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to criteria.
- 14) JT = Hazardous substance may be present in several isomer forms. The health-based SSVIAC may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive health-based SSVIAC of the detected isomers.
- 15) X = Elevated reporting limit due to matrix interference.
- 16) Sample was not collected during 12/8/17 event from vapor point VP-2D due to interference with groundwater.
- 17) Samples were not collected during 6/29/18 event from vapor points VP-1D, VP-2D, and VP-3M due to interference with groundwater.
- 18) Samples were not collected during 10/25/18 event from vapor points VP-4S, VP-4M, VP-4D, and VP-5D due to interference with groundwater.
- 19) During the 11/18/19 event groundwater samples were collected from (VP-1D, VP-3M, VP-3D, VP-4S, VP-4M, VP-4D, VP-6S, & VP-6M) where groundwater interference was encountered.
- 19) During the 2/22/21 & 2/23/21 event groundwater samples were collected from (VP-1S, VP-1D, VP-2S, VP-3M, VP-3D, VP-6S, & VP-6M) where groundwater interference was encountered.

TABLE 2
RACER Trust - Coldwater Road
Volatile Organics (VOCs) Groundwater Analytical Results
Collected from Vapor Probes - November 2019 and February 2021

Well ID	VP-1S-GW	VP-1D-GW	VP-1D-GW	VP-2S-GW	VP-3M-GW	VP-3M-GW	VP-3D-GW	VP-3D-GW
Sample Date	2/23/2021	11/19/2019	2/23/2021	2/23/2021	11/19/2019	2/22/2021	11/19/2019	2/22/2021
Diethyl ether	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	<50	<50	<50	<50	<50	<50	<50	<50
Methyl iodide	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	<5	<5	<5	<5	<5	<5	<5	<5
tert-Methyl butyl ether (MTBE)	<5	<5	<5	<5	<5	<5	<5	<5
Acrylonitrile	<2	<2	<2	<2	<2	<2	<2	<2
2-Butanone	<25	<25	<25	<25	<25	<25	<25	<25
Dichlorodifluoromethane	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl chloride	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	<5	<5	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1
Methylene chloride	<5	<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1
Tetrahydrofuran	<90	<90	<90	<90	<90	<90	<90	<90
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone	<50	<50	<50	<50	<50	<50	<50	<50
2-Hexanone	<50	<50	<50	<50	<50	<50	<50	<50
Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1
Benzene	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	<5	<5	<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-butene	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
p,m-Xylene	<2	<2	<2	<2	<2	<2	<2	<2
o-Xylene	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	<1	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	<5	<5	<5	<5	<5	<5	<5	<5
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1
n-Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1
Hexachloroethane	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	<5	<5	<5	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	<5	<5	<5	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	<5	<5	<5	<5	<5	<5	<5	<5
Napthalene	<5	<5	<5	<5	<5	<5	<5	<5
2-Methylnapthalene	<5	<5	<5	<5	<5	<5	<5	<5

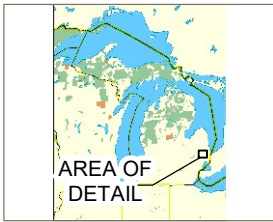
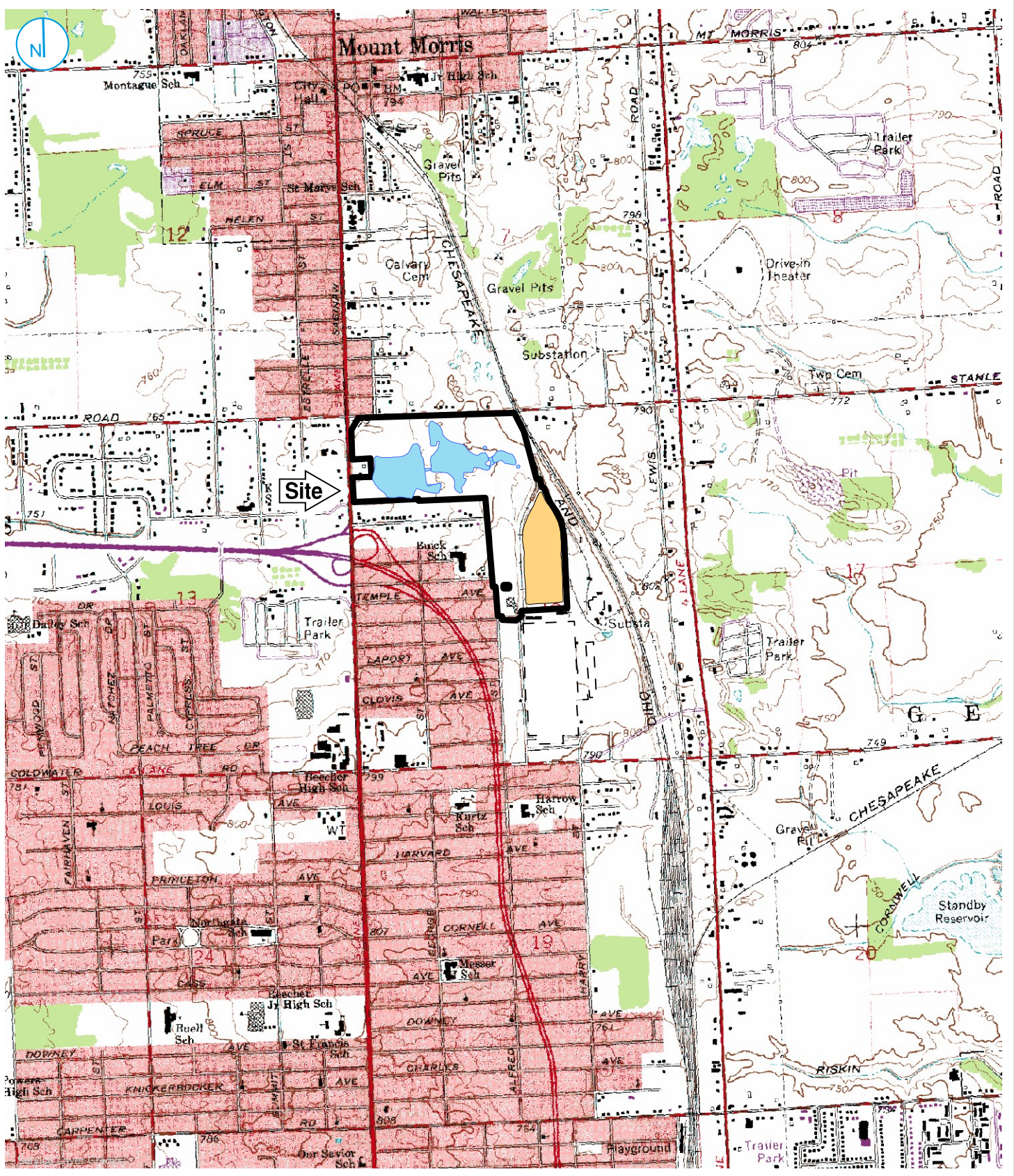
Notes:
EPA Method 8260 used for analysis.
Dup- Duplicate analysis
Analysis in µg/L

TABLE 2
RACER Trust - Coldwater Road
Volatile Organics (VOCs) Groundwater Analytical Results
Collected from Vapor Probes - November 2019 and February 2021

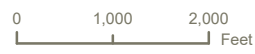
Well ID <i>Sample Date</i>	VP-4S-GW	VP-4M-GW	VP-4D-GW	VP-6S-GW	VP-6S-GW	VP-6M-GW	VP-6M-GW	Trip Blank- 111919	Trip Blank- 022321
	11/19/2019	11/19/2019	11/19/2019	11/18/2019	2/22/2021	11/18/2019	2/22/2021	11/19/2019	2/23/2021
Diethyl ether	<10	<10	<10	<10	<10	<10	<10	<10	<10
Acetone	<50	<50	<50	<50	<50	<50	<50	<50	<50
Methyl iodide	<1	<1	<1	<1	<1	<1	<1	<1	<1
Carbon Disulfide	<5	<5	<5	<5	<5	<5	<5	<5	<5
tert-Methyl butyl ether (MTBE)	<5	<5	<5	<5	<5	<5	<5	<5	<5
Acrylonitrile	<2	<2	<2	<2	<2	<2	<2	<2	<2
2-Butanone	<25	<25	<25	<25	<25	<25	<25	<25	<25
Dichlorodifluoromethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl chloride	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromomethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Methylene chloride	<5	<5	<5	<5	<5	<5	<5	<5	<5
trans-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
cis-1,2-Dichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrahydrofuran	<90	<90	<90	<90	<90	<90	<90	<90	<90
Chloroform	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromochloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
4-Methyl-2-pentanone	<50	<50	<50	<50	<50	<50	<50	<50	<50
2-Hexanone	<50	<50	<50	<50	<50	<50	<50	<50	<50
Carbon tetrachloride	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Trichloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromodichloromethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromomethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
cis-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,3-Dichloropropene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2-Trichloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Tetrachloroethene	<1	<1	<1	<1	<1	<1	<1	<1	<1
trans-1,4-Dichloro-2-butene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Dibromochloromethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dibromoethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,1,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
Ethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
p,m-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2
o-Xylene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Styrene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Isopropylbenzene	<5	<5	<5	<5	<5	<5	<5	<5	<5
Bromoform	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,1,2,2-Tetrachloroethane	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trichloropropane	<1	<1	<1	<1	<1	<1	<1	<1	<1
n-Propylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Bromobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,3,5-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
tert-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,4-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
sec-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
p-Isopropyltoluene	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
1,2,3-Trimethylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
n-Butylbenzene	<1	<1	<1	<1	<1	<1	<1	<1	<1
Hexachloroethane	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-Dibromo-3-chloropropane	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2,4-Trichlorobenzene	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2,3-Trichlorobenzene	<5	<5	<5	<5	<5	<5	<5	<5	<5
Napthalene	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-Methylnapthalene	<5	<5	<5	<5	<5	<5	<5	<5	<5

Notes:
EPA Method 8260 used for analysis.
Dup- Duplicate analysis
Analysis in µg/L

FIGURES



Map Scale: 1:1,24,000;
Map Center: 83°41'9"W 43°5'51"N



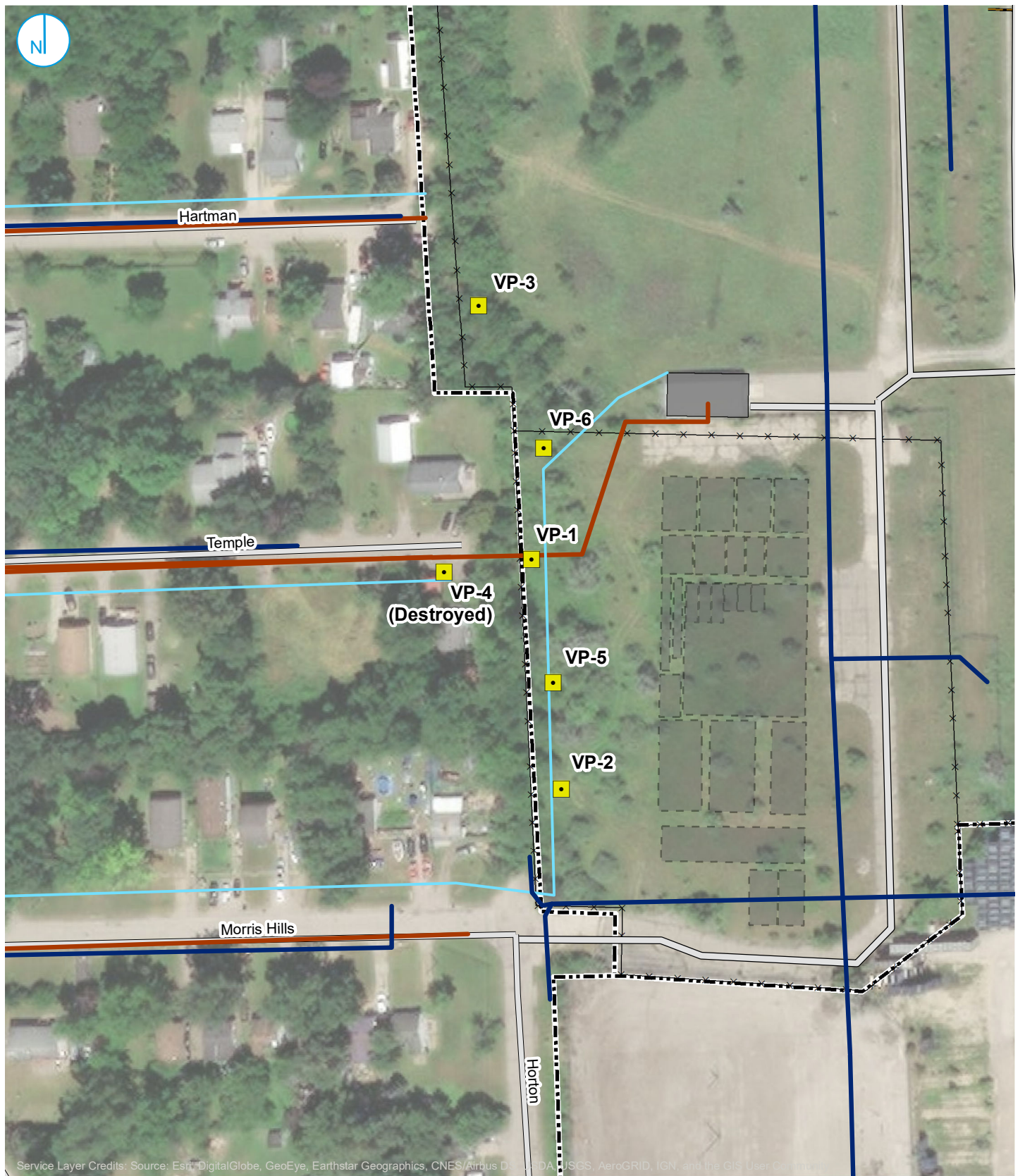
SITE LOCATION

FIGURE 01

O'BRIEN & GERE ENGINEERS, INC.
A RAMBOLL COMPANY

Racer Trust
Coldwater Road Landfill Facility
Flint, Michigan





Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus D... DA, USGS, AeroGRID, IGN, and the GIS User Community

LEGEND

- VAPOR POINT LOCATION
- FORMER BUILDING
- WATER LINE
- SANITARY SEWER LINE
- STORM SEWER LINE
- PROPERTY BOUNDARY



VAPOR POINT LOCATIONS

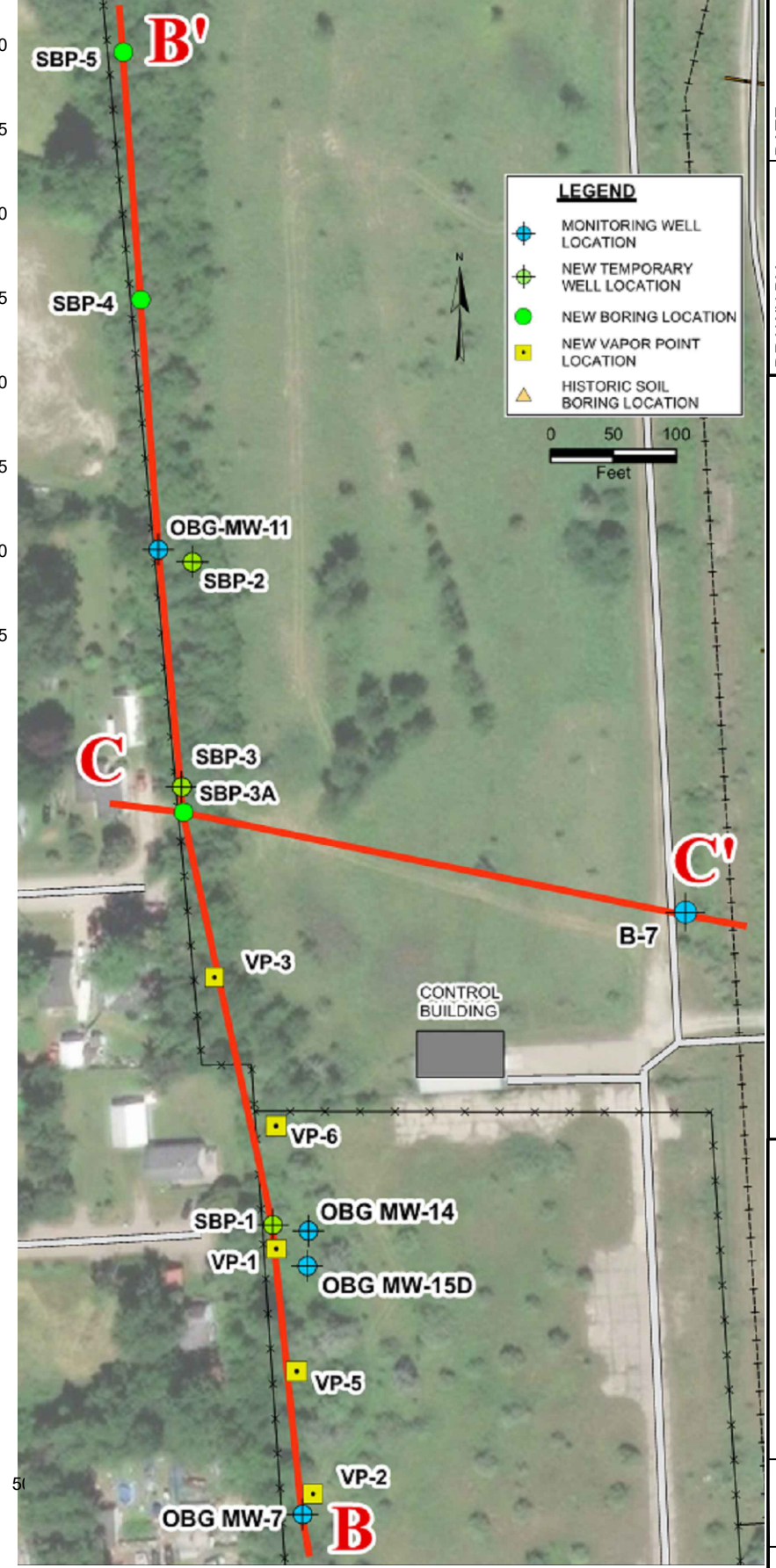
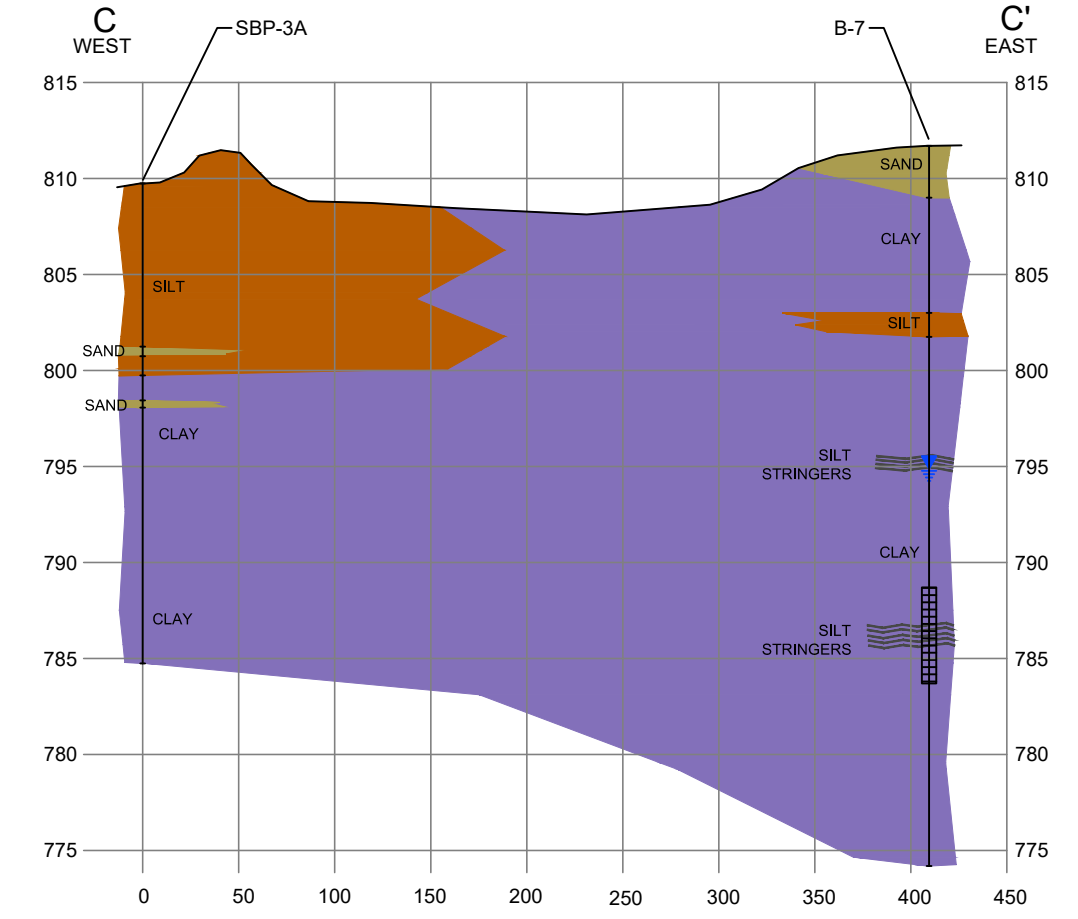
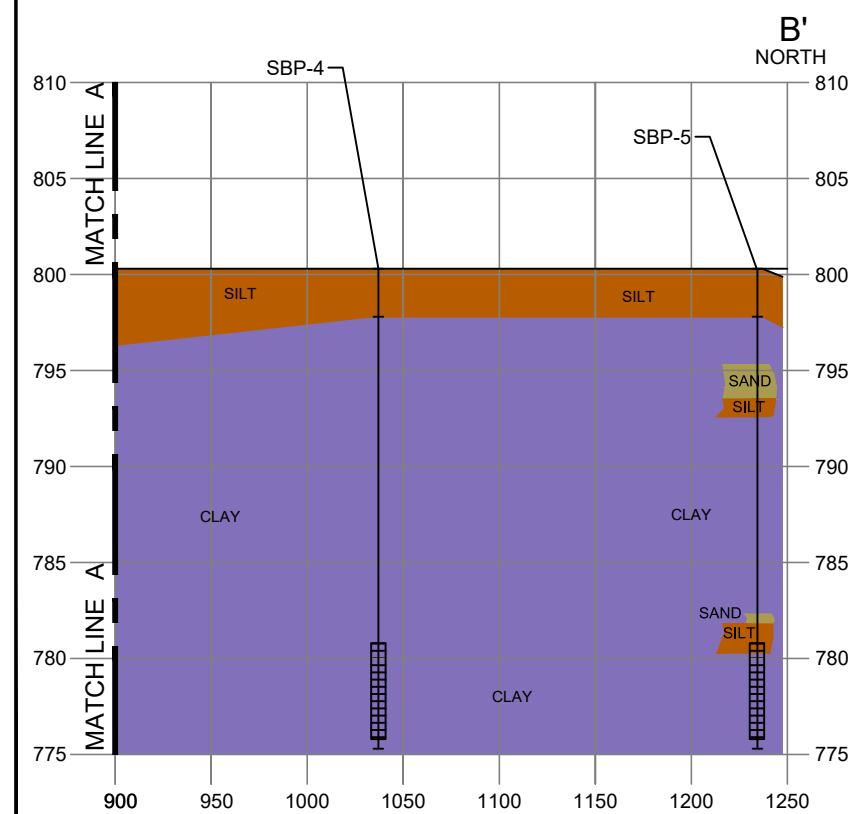
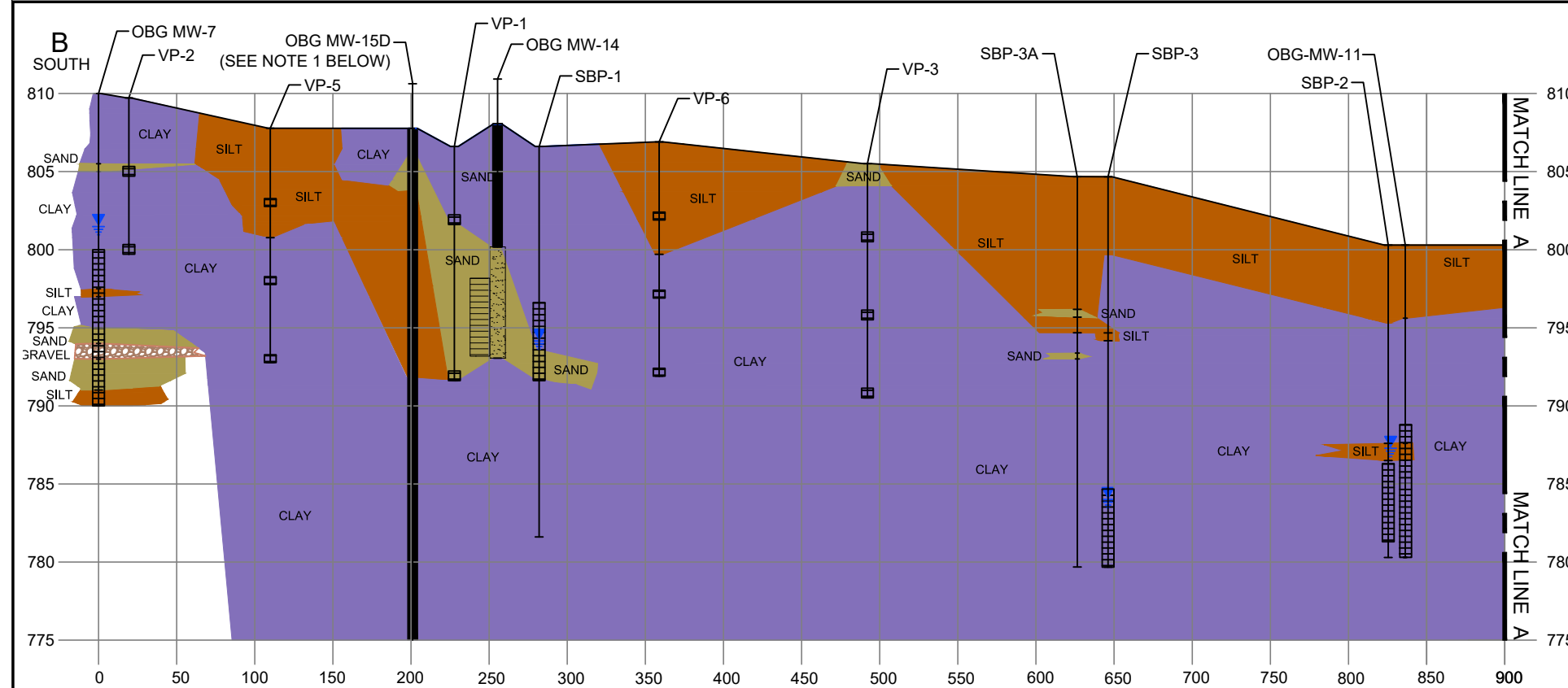
FIGURE 02

RACER TRUST
COLDWATER ROAD
FLINT, MICHIGAN

RAMBOLL US CORPORATION
A RAMBOLL COMPANY

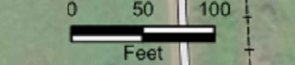


Aug 08, 2019 3:31pm PLOTTED BY: JOHNSOSL SAVED BY: JOHNSOSL
 i:\Racer-Truett\15388\68545\Coldwater-Rd-LVM-D\Cross Sections\Figure 5 - Geologic Cross-Section B-B'-C-C'.dwg Layout1
 XREFS:



LEGEND

- MONITORING WELL LOCATION
- NEW TEMPORARY WELL LOCATION
- NEW BORING LOCATION
- NEW VAPOR POINT LOCATION
- HISTORIC SOIL BORING LOCATION



DRAWN BY:	JMO	DATE:	01/16/2018
CHECKED BY:	CSY	DATE:	01/16/2018
APPROVED BY:	CSY	DATE:	01/16/2018
DRAWING NO.:		REFERENCE:	

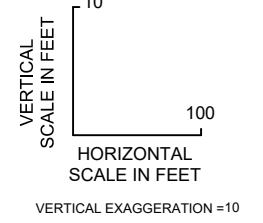
GEOLOGIC CROSS-SECTION B-B'
GEOLOGIC CROSS-SECTION C-C'

RACER
 COLDWATER ROAD LANDFILL SITE
 FLINT, MICHIGAN



PROJECT NO.
68545

FIGURE NO.
03



NOTE:
 1. INFORMATION SHOWN BELOW 775 FT MSL IS NOT PROVIDED AS IT IS NOT PERTINENT TO THE VI STUDY.



APPENDIX A
Soil Vapor (Bottle Vac®)
Sample Collection Field Forms



Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 1940100783 Date 2/23/21
Project Name RAKEE Coldwater Rd Collector KBS/WHL

Table with columns for Sample ID, Start Date/Time, End Date/Time, Canister ID, Flow controller ID, Associated ambient air sample ID, Analytical method required, Vacuum gauge "zero" ("Hg), Start Pressure ("Hg), End Pressure ("Hg), End pressure > "zero"?, Sampling duration (intended), Depth of sample point, Laboratory used.

Tubing type used 1/4 I.D. 3/8 O.D. Length of tubing 8 13 18 cm Tubing volume 77 125 173 cc

Volume purged 231 375 519 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Beginning: 45.7% End of purging: End of sampling: Helium S D S D

Gas Analyzer Readings %O2 N/A %CO2 N/A %CH4 N/A PID reading 0 0 (ppmv) Before: S M D After: S M D

Weather Conditions during Probe Installation: Air temperature (°F) Rainfall Wind direction Barometric pressure Wind speed (mph) Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling: Air temperature (°F) 37 Rainfall NONE Wind direction W Barometric pressure 29.64 Wind speed (mph) 15 Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: freezing Rain/snow in morning 2/22/21

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: VP-15 / VP-1D flooded and collected water samples

1639 water VP-15 1042 VP-1D



Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 1940100783 Date 2/23/21
Project Name RACER coldwater rd Collector KBS / WHL

Table with columns for Sample ID, Start Date/Time, End Date/Time, Canister ID, Flow controller ID, Associated ambient air sample ID, Analytical method required, Vacuum gauge "zero" ("Hg), Start Pressure ("Hg), End Pressure ("Hg), End pressure > "zero"?, Sampling duration (intended), Depth of sample point, Laboratory used.

Tubing type used 1/4 I.D. 3/8 O.D. Length of tubing 8 13 18 cm Tubing volume 77 125 173 cc

Volume purged 231 375 519 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Beginning: 40.6% End of purging: End of sampling: 34.3%
Helium before 5 D After 5 D
125 750 0

Gas Analyzer Readings %O2 N/A %CO2 N/A %CH4 N/A PID reading 0 0 (ppmv) 0 0 (ppmv)
Noticeable odor No Soil type clay

Weather Conditions during Probe Installation:
Air temperature (°F) Rainfall Wind direction
Barometric pressure Wind speed (mph)
Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:

Weather Conditions at Start of Sampling:
Air temperature (°F) 44 Rainfall NONE Wind direction W
Barometric pressure 28.88 Wind speed (mph) 20 mph
Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs:
freezing rain/snow in morning 2/22/21

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: VP-2S flooded and collected water sample



Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 1940100783 Date 2/22/21
Project Name BAKER cold water Collector KBS/WHL

Table with columns for Sample ID (VP-3S, VP-3M, VP-3D) and rows for Vacuum gauge, Start/End Date/Time, Start/End Pressure, Canister ID, End pressure, Flow controller ID, Sampling duration, Associated ambient air sample ID, Depth of sample point, Analytical method required, Laboratory used.

Tubing type used 1/4 I.D. 3/8 O.D. Length of tubing 8 13 18 cm Tubing volume 77 125 173 cc

Volume purged 231 375 519 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Helium Before S M D After S M D Beginning: 64.8% End of purging: End of sampling: 35%

Gas Analyzer Readings %O2 N/A %CO2 N/A %CH4 N/A PID reading 0 (ppmv) Noticeable odor No Soil type clay

Weather Conditions during Probe Installation: Air temperature, Rainfall, Wind direction, Barometric pressure, Wind speed

Weather Conditions at Start of Sampling: Air temperature 34°F, Rainfall NONE, Wind direction WSW, Barometric pressure 28.82, Wind speed 18

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: DUP-1 = VP-3
VP-3M / VP-3D flooded and collected water sample



Soil Vapor (Bottle Vac®) Sample Collection Field Form

Project # 1940100783 Date 2/22/21
 Project Name RACER coldwater rd Collector KBS / WHL

Sample ID	VP-5S	VP-5M	VP-5D	Vacuum gauge "zero" ("Hg)	VP-5S	VP-5M	VP-5D
Start Date/Time	2/22 1209	2/22 1214	2/22 1149	Start Pressure ("Hg)	-25	-26	-26
End Date/Time	2/22 1217	2/22 1222	2/22 1159	End Pressure ("Hg)	-2	-2	-2
Canister ID	23674	13719	16841	End pressure > "zero"?	yes	yes	yes
Flow controller ID	139	223	19	Sampling duration (intended)	10 minutes		
Associated ambient air sample ID	N/A			Depth of sample point	5 fbg	10 fbg	15 fbg
Analytical method required	TO-15			Laboratory used	Merit Laboratories		

Tubing type used 1/4 I.D. 3/8 O.D. Length of tubing

S	M	D
8	13	18

 cm Tubing volume

S	M	D
77	125	173

 cc

Volume purged

S	M	D
231	375	519

 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Beginning: 46.2% End of purging: 38.9% End of sampling: 33%
 Helium Before

S	M	D
0	0	0

 After

S	M	D
0	0	0

Gas Analyzer Readings %O₂ N/A %CO₂ N/A %CH₄ N/A PID reading

S	M	D
0	0	0

 (ppmv)

S	M	D
0	0	0

 (ppmv)
 Noticeable odor No Soil type clay

Weather Conditions during Probe Installation:
 Air temperature (°F) _____ Rainfall _____ Wind direction _____
 Barometric pressure _____ Wind speed (mph) _____
 Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: _____

Weather Conditions at Start of Sampling:
 Air temperature (°F) 35 Rainfall NONE Wind direction WSW
 Barometric pressure 28.81 Wind speed (mph) 18
 Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: freezing rain/snow in morning 2/22/21

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: _____

Project # 1940100783
Project Name BALER Coldwater Rd

Date 2/22/21
Collector KBS / WHL

Sample ID	VP-6S	VP-6M	VP-6D	Vacuum gauge "zero" ("Hg)	VP-6S	VP-6M	VP-6D
Start Date/Time			<u>2/22/21 1450</u>	Start Pressure ("Hg)			<u>-28</u>
End Date/Time			<u>2/22/21 1500</u>	End Pressure ("Hg)	<u>Water</u>	<u>Water</u>	<u>-26</u>
Canister ID			<u>18351</u>	End pressure > "zero"?			<u>-2</u>
Flow controller ID			<u>181</u>	Sampling duration (intended)	<u>10 minutes</u>		
Associated ambient air sample ID	<u>N/A</u>			Depth of sample point	<u>5 fbg</u>	<u>10 fbg</u>	<u>15 fbg</u>
Analytical method required	<u>TO-15</u>			Laboratory used	<u>Merit Laboratories</u>		

Tubing type used	Length of tubing			Tubing volume	Tubing volume		
	S	M	D		S	M	D
<u>1/4 I.D. 3/8 O.D.</u>	<u>8</u>	<u>13</u>	<u>18</u>	cc	<u>77</u>	<u>125</u>	<u>173</u>

Volume purged

S	M	D
<u>231</u>	<u>375</u>	<u>519</u>

 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Beginning: 40.9% End of purging: _____ End of sampling: 28.9%
Helium Before

S	M	D
<u>0</u>	<u>0</u>	<u>0</u>

 After

S	M	D
<u>0</u>	<u>0</u>	<u>0</u>

Gas Analyzer Readings %O₂ N/A %CO₂ N/A %CH₄ N/A PID reading

S	M	D
		<u>0</u>

 (ppmv)

S	M	D
		<u>0</u>

 (ppmv)
Noticeable odor NO Soil type clay

Weather Conditions during Probe Installation:
Air temperature (°F) _____ Rainfall _____ Wind direction _____
Barometric pressure _____ Wind speed (mph) _____
Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: _____

Weather Conditions at Start of Sampling:
Air temperature (°F) 35 Rainfall NONE Wind direction W
Barometric pressure 28.83 Wind speed (mph) 17
Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: _____

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments: VP-6D attempted groundwater and vapor sample. No vapor or groundwater sample was collected will attempt 8 hour sample

Project # 1940100783 Date 2/23/21
 Project Name RACER Coldwater Rd Collector KBS

Sample ID VP-6D Vacuum gauge "zero" ("Hg) VP-6D
0
 Start Date/Time 2/23/21 855 Start Pressure ("Hg) -28
 End Date/Time 2/23/21 1655 End Pressure ("Hg) -25
 Canister ID 12431 End pressure > "zero"? 0
 Flow controller ID 801 Sampling duration (intended) ±0 minutes 8 hour
 Associated ambient air sample ID N/A Depth of sample point 5 fbg 10 fbg 15 fbg
 Analytical method required TO-15 Laboratory used Merit Laboratories

Tubing type used 1/4 I.D., 3/8 O.D. Length of tubing

S	M	D
8	13	18

 cm Tubing volume

S	M	D
77	125	173

 cc

Volume purged

S	M	D
231	375	519

 cc @ 0.1 l/min (100cc/min) 3 volumes purged @ < 200cc/min? Yes

Shroud tracer gas conc. Beginning: 66.5% End of purging: _____ End of sampling: 0
 Helium Before 0 After 0 Before:

S	M	D

 After:

S	M	D

Gas Analyzer Readings %O₂ N/A %CO₂ N/A %CH₄ N/A PID reading

S	M	D
		6

 (ppmv)

S	M	D
		0

 (ppmv)
 Noticeable odor NO Soil type clay

Weather Conditions during Probe Installation:
 Air temperature (°F) _____ Rainfall _____ Wind direction _____
 Barometric pressure _____ Wind speed (mph) _____
 Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: _____

Weather Conditions at Start of Sampling:
 Air temperature (°F) 37-45 Rainfall NONE - NONE Wind direction w-w
 Barometric pressure 28.75 - 28.91 Wind speed (mph) 15-20
 Substantial changes in weather conditions during sampling or over the past 24 to 48 hrs: _____

Site Plan showing sample location, buildings, landmarks, potential soil vapor and outdoor air sources, preferential pathways

Comments:

VP-6D	Time	Pressure
	1100	-26
	1400	-25
	1535	-25
	1645	-25

APPENDIX B
Analytical Laboratory Results



Analytical Laboratory Report

Report ID: S21729.01(01)
Generated on 02/26/2021

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Additional Contacts: Kevin Schneider

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): S21729.01-S21729.06
Project: RACER Coldwater ROAD
Collected Date(s): 02/22/2021
Submitted Date/Time: 02/24/2021 13:40
Sampled by: Kevin Schneider
P.O. #: 11900504

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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).

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 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.

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

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
TO-15	EPA TO-15 Second Edition January 1999



Analytical Laboratory Report

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S21729.01	VP-5D	Air	02/22/21 11:49 - 02/22/21 11:59
S21729.02	VP-5S	Air	02/22/21 12:09 - 02/22/21 12:17
S21729.03	VP-5M	Air	02/22/21 12:14 - 02/22/21 12:22
S21729.04	VP-3S	Air	02/22/21 16:25 - 02/22/21 16:42
S21729.05	DUP-1	Air	02/22/21 00:01 - 02/22/21 00:02
S21729.06	VP-2D	Air	02/22/21 13:56 - 02/22/21 14:05



Analytical Laboratory Report

Lab Sample ID: S21729.01

Sample Tag: VP-5D

Collected Date/Time: 02/22/2021 11:49 - 02/22/2021 11:59

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-2	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 12:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.01 (continued)

Sample Tag: VP-5D

TO-15, Method: TO-15, Run Date: 02/26/21 12:28, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	3	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 12:28, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.01 (continued)

Sample Tag: VP-5D

TO-15, Method: TO-15, Run Date: 02/26/21 12:28, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	8.8	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.01 (continued)

Sample Tag: VP-5D

TO-15, Method: TO-15, Run Date: 02/26/21 12:28, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	



Analytical Laboratory Report

Lab Sample ID: S21729.02

Sample Tag: VP-5S

Collected Date/Time: 02/22/2021 12:09 - 02/22/2021 12:17

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	0	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 13:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.02 (continued)

Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 02/26/21 13:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	Not detected	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 13:00, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.02 (continued)

Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 02/26/21 13:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	Not detected	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.02 (continued)

Sample Tag: VP-5S

TO-15, Method: TO-15, Run Date: 02/26/21 13:00, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	



Analytical Laboratory Report

Lab Sample ID: S21729.03

Sample Tag: VP-5M

Collected Date/Time: 02/22/2021 12:14 - 02/22/2021 12:22

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-2	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 13:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.03 (continued)

Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 02/26/21 13:32, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	Not detected	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 13:32, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.03 (continued)

Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 02/26/21 13:32, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	Not detected	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.03 (continued)

Sample Tag: VP-5M

TO-15, Method: TO-15, Run Date: 02/26/21 13:32, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	



Analytical Laboratory Report

Lab Sample ID: S21729.04

Sample Tag: VP-3S

Collected Date/Time: 02/22/2021 16:25 - 02/22/2021 16:42

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	0	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 04:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.04 (continued)

Sample Tag: VP-3S

TO-15, Method: TO-15, Run Date: 02/26/21 04:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	4	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 04:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.04 (continued)

Sample Tag: VP-3S

TO-15, Method: TO-15, Run Date: 02/26/21 04:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	12	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.04 (continued)

Sample Tag: VP-3S

TO-15, Method: TO-15, Run Date: 02/26/21 04:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	



Analytical Laboratory Report

Lab Sample ID: S21729.05

Sample Tag: DUP-1

Collected Date/Time: 02/22/2021 00:01 - 02/22/2021 00:02

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	0	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 05:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	Not detected	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.05 (continued)

Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 02/26/21 05:22, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	4	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 05:22, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	Not detected	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.05 (continued)

Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 02/26/21 05:22, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	12	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.05 (continued)

Sample Tag: DUP-1

TO-15, Method: TO-15, Run Date: 02/26/21 05:22, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	



Analytical Laboratory Report

Lab Sample ID: S21729.06

Sample Tag: VP-2D

Collected Date/Time: 02/22/2021 13:56 - 02/22/2021 14:05

Matrix: Air

COC Reference: A4408

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	Air Canister	None	No	RT	n/a

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Pressure check for TO-15*	-2	N/A	02/25/21 15:30	KAG	

Organics - Volatiles

TO-15, Method: TO-15, Run Date: 02/26/21 05:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	20		ppbv	10	67-64-1	
1,3-Butadiene	Not detected	10		ppbv	10	106-99-0	
Benzene	3	2		ppbv	10	71-43-2	
Bromodichloromethane	Not detected	2		ppbv	10	75-27-4	
Bromoform	Not detected	2		ppbv	10	75-25-2	
Bromomethane	Not detected	2		ppbv	10	74-83-9	
Vinyl bromide	Not detected	2		ppbv	10	593-60-2	
Benzyl chloride	Not detected	2		ppbv	10	100-44-7	
Carbon disulfide	Not detected	5		ppbv	10	75-15-0	
Chlorobenzene	Not detected	2		ppbv	10	108-90-7	
Chloroethane	Not detected	20		ppbv	10	75-00-3	
Chloroform	Not detected	2		ppbv	10	67-66-3	
Chloromethane	Not detected	20		ppbv	10	74-87-3	
3-Chloropropene	Not detected	2		ppbv	10	107-05-1	
2-Chlorotoluene	Not detected	2		ppbv	10	95-49-8	
Carbon tetrachloride	Not detected	2		ppbv	10	56-23-5	
Cyclohexane	Not detected	2		ppbv	10	110-82-7	
1,1-Dichloroethane	Not detected	2		ppbv	10	75-34-3	
1,1-Dichloroethene	Not detected	2		ppbv	10	75-35-4	
1,2-Dibromoethane	Not detected	2		ppbv	10	106-93-4	
1,2-Dichloroethane	Not detected	2		ppbv	10	107-06-2	
1,2-Dichloropropane	Not detected	2		ppbv	10	78-87-5	
1,4-Dioxane	Not detected	25		ppbv	10	123-91-1	
Dichlorodifluoromethane	Not detected	2		ppbv	10	75-71-8	
Dibromochloromethane	Not detected	2		ppbv	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	2		ppbv	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	2		ppbv	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	2		ppbv	10	541-73-1	
1,2-Dichlorobenzene	Not detected	2		ppbv	10	95-50-1	
1,4-Dichlorobenzene	Not detected	2		ppbv	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	2		ppbv	10	10061-02-6	
Ethanol*	Not detected	120		ppbv	10	64-17-5	
Ethylbenzene	Not detected	2		ppbv	10	100-41-4	
Ethyl Acetate*	Not detected	20		ppbv	10	141-78-6	
4-Ethyltoluene	Not detected	2		ppbv	10	622-96-8	
Freon 113	Not detected	2		ppbv	10	76-13-1	



Analytical Laboratory Report

Lab Sample ID: S21729.06 (continued)

Sample Tag: VP-2D

TO-15, Method: TO-15, Run Date: 02/26/21 05:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Freon 114	Not detected	2		ppbv	10	76-14-2	
Heptane	Not detected	2		ppbv	10	142-82-5	
Hexachlorobutadiene	Not detected	2		ppbv	10	87-68-3	
Hexane	Not detected	2		ppbv	10	110-54-3	
2-Hexanone*	Not detected	5		ppbv	10	591-78-6	
Isopropyl Alcohol*	Not detected	20		ppbv	10	67-63-0	
Methylene chloride	Not detected	5		ppbv	10	75-09-2	
2-Butanone (MEK)	Not detected	20		ppbv	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	5		ppbv	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	2		ppbv	10	1634-04-4	
Methyl methacrylate	Not detected	2		ppbv	10	80-62-6	
Naphthalene	Not detected	2		ppbv	10	91-20-3	
Propylene*	Not detected	100		ppbv	10	115-07-1	
Styrene	Not detected	2		ppbv	10	100-42-5	
1,1,1-Trichloroethane	Not detected	2		ppbv	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	2		ppbv	10	79-34-5	
1,1,2-Trichloroethane	Not detected	2		ppbv	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	5		ppbv	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	2		ppbv	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	2		ppbv	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	2		ppbv	10	540-84-1	
Tert-butyl Alcohol	Not detected	10		ppbv	10	75-65-0	
Tetrachloroethene	Not detected	2		ppbv	10	127-18-4	
Tetrahydrofuran*	7	2		ppbv	10	109-99-9	
Toluene	Not detected	2		ppbv	10	108-88-3	
Trichloroethene	Not detected	2		ppbv	10	79-01-6	
Trichlorofluoromethane	Not detected	2		ppbv	10	75-69-4	
Vinyl chloride	Not detected	2		ppbv	10	75-01-4	
Vinyl acetate	Not detected	2		ppbv	10	108-05-4	
p,m-Xylene	Not detected	4		ppbv	10		
o-Xylene	Not detected	2		ppbv	10	95-47-6	
Total Xylenes	Not detected	6		ppbv	10	1330-20-7	

TO-15, Method: TO-15, Run Date: 02/26/21 05:54, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	48		ug/m3	10	67-64-1	
1,3-Butadiene	Not detected	22		ug/m3	10	106-99-0	
Benzene	9.6	6.4		ug/m3	10	71-43-2	
Bromodichloromethane	Not detected	13		ug/m3	10	75-27-4	
Bromoform	Not detected	21		ug/m3	10	75-25-2	
Bromomethane	Not detected	7.8		ug/m3	10	74-83-9	
Vinyl bromide	Not detected	8.7		ug/m3	10	593-60-2	
Benzyl chloride	Not detected	10		ug/m3	10	100-44-7	
Carbon disulfide	Not detected	16		ug/m3	10	75-15-0	
Chlorobenzene	Not detected	9.2		ug/m3	10	108-90-7	
Chloroethane	Not detected	53		ug/m3	10	75-00-3	
Chloroform	Not detected	9.8		ug/m3	10	67-66-3	
Chloromethane	Not detected	41		ug/m3	10	74-87-3	
3-Chloropropene	Not detected	6.3		ug/m3	10	107-05-1	
2-Chlorotoluene	Not detected	10		ug/m3	10	95-49-8	



Analytical Laboratory Report

Lab Sample ID: S21729.06 (continued)

Sample Tag: VP-2D

TO-15, Method: TO-15, Run Date: 02/26/21 05:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Carbon tetrachloride	Not detected	13		ug/m3	10	56-23-5	
Cyclohexane	Not detected	6.9		ug/m3	10	110-82-7	
1,1-Dichloroethane	Not detected	8.1		ug/m3	10	75-34-3	
1,1-Dichloroethene	Not detected	7.9		ug/m3	10	75-35-4	
1,2-Dibromoethane	Not detected	15		ug/m3	10	106-93-4	
1,2-Dichloroethane	Not detected	8.1		ug/m3	10	107-06-2	
1,2-Dichloropropane	Not detected	9.2		ug/m3	10	78-87-5	
1,4-Dioxane	Not detected	90		ug/m3	10	123-91-1	
Dichlorodifluoromethane	Not detected	9.9		ug/m3	10	75-71-8	
Dibromochloromethane	Not detected	17		ug/m3	10	124-48-1	
trans-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-60-5	
cis-1,2-Dichloroethene	Not detected	7.9		ug/m3	10	156-59-2	
cis-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-01-5	
1,3-Dichlorobenzene	Not detected	12		ug/m3	10	541-73-1	
1,2-Dichlorobenzene	Not detected	12		ug/m3	10	95-50-1	
1,4-Dichlorobenzene	Not detected	12		ug/m3	10	106-46-7	
trans-1,3-Dichloropropene	Not detected	9.1		ug/m3	10	10061-02-6	
Ethanol*	Not detected	230		ug/m3	10	64-17-5	
Ethylbenzene	Not detected	8.7		ug/m3	10	100-41-4	
Ethyl Acetate*	Not detected	72		ug/m3	10	141-78-6	
4-Ethyltoluene	Not detected	9.8		ug/m3	10	622-96-8	
Freon 113	Not detected	15		ug/m3	10	76-13-1	
Freon 114	Not detected	14		ug/m3	10	76-14-2	
Heptane	Not detected	8.2		ug/m3	10	142-82-5	
Hexachlorobutadiene	Not detected	21		ug/m3	10	87-68-3	
Hexane	Not detected	7.0		ug/m3	10	110-54-3	
2-Hexanone*	Not detected	20		ug/m3	10	591-78-6	
Isopropyl Alcohol*	Not detected	49		ug/m3	10	67-63-0	
Methylene chloride	Not detected	17		ug/m3	10	75-09-2	
2-Butanone (MEK)	Not detected	59		ug/m3	10	78-93-3	
4-Methyl-2-pentanone (MIBK)	Not detected	20		ug/m3	10	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	7.2		ug/m3	10	1634-04-4	
Methyl methacrylate	Not detected	8.2		ug/m3	10	80-62-6	
Naphthalene	Not detected	10		ug/m3	10	91-20-3	
Propylene*	Not detected	170		ug/m3	10	115-07-1	
Styrene	Not detected	8.5		ug/m3	10	100-42-5	
1,1,1-Trichloroethane	Not detected	11		ug/m3	10	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	14		ug/m3	10	79-34-5	
1,1,2-Trichloroethane	Not detected	11		ug/m3	10	79-00-5	
1,2,4-Trichlorobenzene	Not detected	37		ug/m3	10	120-82-1	
1,2,4-Trimethylbenzene	Not detected	9.8		ug/m3	10	95-63-6	
1,3,5-Trimethylbenzene	Not detected	9.8		ug/m3	10	108-67-8	
2,2,4-Trimethylpentane	Not detected	9.3		ug/m3	10	540-84-1	
Tert-butyl Alcohol	Not detected	30		ug/m3	10	75-65-0	
Tetrachloroethene	Not detected	14		ug/m3	10	127-18-4	
Tetrahydrofuran*	21	5.9		ug/m3	10	109-99-9	
Toluene	Not detected	7.5		ug/m3	10	108-88-3	
Trichloroethene	Not detected	11		ug/m3	10	79-01-6	
Trichlorofluoromethane	Not detected	11		ug/m3	10	75-69-4	
Vinyl chloride	Not detected	5.1		ug/m3	10	75-01-4	



Analytical Laboratory Report

Lab Sample ID: S21729.06 (continued)

Sample Tag: VP-2D

TO-15, Method: TO-15, Run Date: 02/26/21 05:54, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Vinyl acetate	Not detected	7.0		ug/m3	10	108-05-4	
p,m-Xylene	Not detected	17		ug/m3	10		
o-Xylene	Not detected	8.7		ug/m3	10	95-47-6	
Total Xylenes	Not detected	26		ug/m3	10	1330-20-7	

Merit Laboratories Login Checklist

Lab Set ID:S21729

Client:OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater ROAD

Submitted:02/24/2021 13:40 Login User: MMC

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211

FAX:

Email: Clifford.Yantz@ramboll.com

Selection	Description	Note
-----------	-------------	------

Sample Receiving

- | | | |
|-----|--|--|
| 01. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # RT |
| 02. | <input type="checkbox"/> Yes <input checked="" 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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" 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

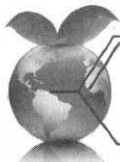
- | | | |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks 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 type="checkbox"/> No <input checked="" 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: _____



Merit
Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

A 4408

REPORT TO

AIR/GAS SAMPLES CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz / Kevin Schneider
 COMPANY Ramboll
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 FAX NO. _____ P.O. NO. _____
 EMAIL ADDRESS clifford.yantz@ramboll.com / kevin.schneider@ramboll.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ EMAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RALER Coldwater Road SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED LEVEL II LEVEL III LEVEL IV EDD OTHER _____

Certifications
 OHIO VAP NELAP
 DoD NPDES

Sample Type

Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (specify in notes)	Analyses	
					TO-15	Other (specify in notes)
		X			X	
		X			X	
		X			X	
		X			X	
		X			X	
		X			X	

MERIT LAB NO. FOR LAB USE ONLY	SAMPLE TAG IDENTIFICATION-DESCRIPTION	Start		Stop		Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID
		Date	Time	Date	Time				
<u>21729.01</u>	<u>VP-5D</u>	<u>2/22/21</u>	<u>1149</u>	<u>2/22/21</u>	<u>1159</u>	<u>-26</u>	<u>-2</u>	<u>19</u>	<u>16841</u>
<u>.02</u>	<u>VP-5S</u>	<u>2/22/21</u>	<u>1209</u>	<u>2/22/21</u>	<u>1217</u>	<u>-25</u>	<u>-2</u>	<u>139</u>	<u>23674</u>
<u>.03</u>	<u>VP-5M</u>	<u>2/22/21</u>	<u>1214</u>	<u>2/22/21</u>	<u>1222</u>	<u>-26</u>	<u>-2</u>	<u>223</u>	<u>13719</u>
<u>.04</u>	<u>VP-3S</u>	<u>2/22/21</u>	<u>1625</u>	<u>2/22/21</u>	<u>1642</u>	<u>-28</u>	<u>-4</u>	<u>110</u>	<u>23699</u>
<u>.05</u>	<u>DUP-1</u>	<u>2/22/21</u>	<u>-</u>	<u>2/22/21</u>	<u>-</u>	<u>-28</u>	<u>-4</u>	<u>-</u>	<u>28919</u>
<u>.06</u>	<u>VP-2D</u>	<u>2/23/21</u>	<u>1350</u>	<u>2/23/21</u>	<u>1405</u>	<u>-26</u>	<u>-2</u>	<u>49</u>	<u>25396</u>

Temperature (Fahrenheit)				Pressure (Inches of Hg)		
Interior	Ambient	Notes	Interior	Ambient	Notes	
	<u>36 °F</u>			<u>28.76</u>		
	<u>45 °F</u>			<u>28.90</u>		

Notes

RELINQUISHED BY: [Signature] DATE 2/21/21 TIME 1245
 RECEIVED BY: [Signature] DATE 2/22/21 TIME 1245
 RELINQUISHED BY: [Signature] DATE 2/22/21 TIME 1340
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 1340

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 TEMP. ON ARRIVAL RT



Quality Control Report

Report ID: QC-S21729-01
Generated on 02/26/2021

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 East Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S21729.01-S21729.06
Project: RACER Coldwater ROAD
Submitted Date/Time: 02/24/2021 13:40
Sampled by: Kevin Schneider
P.O. #: 11900504

QC Report Sections

Cover Page (Page 1)
Analysis Summary (Pages 2-7)
Prep Batch Summary (Page 8)
Surrogates per Lab Sample (Pages 9-14)
Surrogates per QC Sample (Pages 15-16)
Batch QC Results (Pages 17-26)

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: S21729.01

Sample Tag: VP-5D

Collected Date/Time: 02/22/2021 11:49 - 02/22/2021 11:59

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 12:28	210226A8	GV210226G1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21729.02

Sample Tag: VP-5S

Collected Date/Time: 02/22/2021 12:09 - 02/22/2021 12:17

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 13:00	210226A8	GV210226G1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21729.03

Sample Tag: VP-5M

Collected Date/Time: 02/22/2021 12:14 - 02/22/2021 12:22

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 13:32	210226A8	GV210226G1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21729.04

Sample Tag: VP-3S

Collected Date/Time: 02/22/2021 16:25 - 02/22/2021 16:42

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 04:51	210225A8	GV210225G2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21729.05

Sample Tag: DUP-1

Collected Date/Time: 02/22/2021 00:01 - 02/22/2021 00:02

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 05:22	210225A8	GV210225G2	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21729.06

Sample Tag: VP-2D

Collected Date/Time: 02/22/2021 13:56 - 02/22/2021 14:05

Matrix: Air

COC Reference: A4408

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
TO-15	TO-15	02/26/21 05:54	210225A8	GV210225G2	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: GV210225G2

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S21729.04	TO-15	TO-15	02/26/21 04:51	210225A8
S21729.05	TO-15	TO-15	02/26/21 05:22	210225A8
S21729.06	TO-15	TO-15	02/26/21 05:54	210225A8

Organics - Volatiles, Prep Batch ID: GV210226G1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S21729.01	TO-15	TO-15	02/26/21 12:28	210226A8
S21729.02	TO-15	TO-15	02/26/21 13:00	210226A8
S21729.03	TO-15	TO-15	02/26/21 13:32	210226A8

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.01

Sample Tag: VP-5D

Collected Date/Time: 02/22/2021 11:49 - 02/22/2021 11:59

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210226A8, Run Date: 02/26/2021 12:28, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		102.1	60	140

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.02

Sample Tag: VP-5S

Collected Date/Time: 02/22/2021 12:09 - 02/22/2021 12:17

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210226A8, Run Date: 02/26/2021 13:00, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		101.1	60	140

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.03

Sample Tag: VP-5M

Collected Date/Time: 02/22/2021 12:14 - 02/22/2021 12:22

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210226A8, Run Date: 02/26/2021 13:32, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		101.1	60	140

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.04

Sample Tag: VP-3S

Collected Date/Time: 02/22/2021 16:25 - 02/22/2021 16:42

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210225A8, Run Date: 02/26/2021 04:51, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		99.6	60	140

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.05

Sample Tag: DUP-1

Collected Date/Time: 02/22/2021 00:01 - 02/22/2021 00:02

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210225A8, Run Date: 02/26/2021 05:22, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		98.9	60	140

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21729.06

Sample Tag: VP-2D

Collected Date/Time: 02/22/2021 13:56 - 02/22/2021 14:05

Matrix: Air

COC Reference: A4408

Organics - Volatiles, Analysis: TO-15

Run in Batch: 210225A8, Run Date: 02/26/2021 05:54, Matrix: G, Dilution: 10

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		99.5	60	140

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: GV210225G2

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 210225A8.BLKG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:36, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		104.1	60	140

Laboratory Control Sample (LCS)

Lab Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/25/2021 23:32, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		118.1	60	140

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210225A8.LCSDG25B, Parent Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:04, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		119.3	60	140

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: GV210226G1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 210226A8.BLKG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:59, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		102.5	60	140

Laboratory Control Sample (LCS)

Lab Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 06:55, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		120.2	60	140

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210226A8.LCSDG26A, Parent Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:27, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		119.3	60	140

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210225G2

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

Blank (BLK)

Lab Sample ID: 210225A8.BLKG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:36, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	2.00	ppbv
1,3-Butadiene		ND	0.20	ppbv
Benzene		ND	0.20	ppbv
Bromodichloromethane		ND	0.20	ppbv
Bromoform		ND	0.20	ppbv
Bromomethane		ND	0.20	ppbv
Vinyl bromide		ND	0.20	ppbv
Benzyl chloride		ND	0.20	ppbv
Carbon disulfide		ND	0.20	ppbv
Chlorobenzene		ND	0.20	ppbv
Chloroethane		ND	2.00	ppbv
Chloroform		ND	0.20	ppbv
Chloromethane		ND	2.00	ppbv
3-Chloropropene		ND	0.20	ppbv
2-Chlorotoluene		ND	0.20	ppbv
Carbon tetrachloride		ND	0.20	ppbv
Cyclohexane		ND	0.20	ppbv
1,1-Dichloroethane		ND	0.20	ppbv
1,1-Dichloroethene		ND	0.20	ppbv
1,2-Dibromoethane		ND	0.20	ppbv
1,2-Dichloroethane		ND	0.20	ppbv
1,2-Dichloropropane		ND	0.20	ppbv
1,4-Dioxane		ND	0.20	ppbv
Dichlorodifluoromethane		ND	0.20	ppbv
Dibromochloromethane		ND	0.20	ppbv
trans-1,2-Dichloroethene		ND	0.20	ppbv
cis-1,2-Dichloroethene		ND	0.20	ppbv
cis-1,3-Dichloropropene		ND	0.20	ppbv
1,3-Dichlorobenzene		ND	0.20	ppbv
1,2-Dichlorobenzene		ND	0.20	ppbv
1,4-Dichlorobenzene		ND	0.20	ppbv
trans-1,3-Dichloropropene		ND	0.20	ppbv
Ethanol	*	3.85	2.00	ppbv
Ethylbenzene		ND	0.20	ppbv
Ethyl Acetate		ND	2.00	ppbv
4-Ethyltoluene		ND	0.20	ppbv
Freon 113		ND	0.20	ppbv
Freon 114		ND	0.20	ppbv
Heptane		ND	0.20	ppbv
Hexachlorobutadiene		ND	0.20	ppbv
Hexane		ND	0.20	ppbv
2-Hexanone		ND	0.20	ppbv
Isopropyl Alcohol		ND	2.00	ppbv
Methylene chloride		ND	0.20	ppbv
2-Butanone (MEK)		ND	2.00	ppbv
4-Methyl-2-pentanone (MIBK)		ND	0.20	ppbv

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210225G2 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 210225A8.BLKG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:36, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	Conc	RDL	Units
tert-Methyl butyl ether (MTBE)		ND	0.20	ppbv
Methyl methacrylate		ND	0.20	ppbv
Naphthalene		ND	0.20	ppbv
Propylene		ND	2.00	ppbv
Styrene		ND	0.20	ppbv
1,1,1-Trichloroethane		ND	0.20	ppbv
1,1,2,2-Tetrachloroethane		ND	0.20	ppbv
1,1,2-Trichloroethane		ND	0.20	ppbv
1,2,4-Trichlorobenzene		ND	0.20	ppbv
1,2,4-Trimethylbenzene		ND	0.20	ppbv
1,3,5-Trimethylbenzene		ND	0.20	ppbv
2,2,4-Trimethylpentane		ND	0.20	ppbv
Tert-butyl Alcohol		ND	0.20	ppbv
Tetrachloroethene		ND	0.20	ppbv
Tetrahydrofuran		ND	0.20	ppbv
Toluene		ND	0.20	ppbv
Trichloroethene		ND	0.20	ppbv
Trichlorofluoromethane		ND	0.20	ppbv
Vinyl chloride		ND	0.20	ppbv
Vinyl acetate		ND	0.20	ppbv
p,m-Xylene		ND	0.20	ppbv
o-Xylene		ND	0.20	ppbv

Laboratory Control Sample (LCS)

Lab Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/25/2021 23:32, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		103.9	70.0	130.0
1,3-Butadiene		99.5	70.0	130.0
Benzene		98.2	70.0	130.0
Bromodichloromethane		95.0	70.0	130.0
Bromoform		112.2	70.0	130.0
Bromomethane		102.6	70.0	130.0
Vinyl bromide		105.0	70.0	130.0
Benzyl chloride		95.3	70.0	130.0
Carbon disulfide		98.1	70.0	130.0
Chlorobenzene		107.6	70.0	130.0
Chloroethane		100.8	70.0	130.0
Chloroform		95.9	70.0	130.0
Chloromethane		94.2	70.0	130.0
3-Chloropropene		88.7	70.0	130.0
2-Chlorotoluene		104.8	70.0	130.0
Carbon tetrachloride		95.7	70.0	130.0
Cyclohexane		98.4	70.0	130.0
1,1-Dichloroethane		94.1	70.0	130.0
1,1-Dichloroethene		94.7	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210225G2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/25/2021 23:32, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromoethane		109.0	70.0	130.0
1,2-Dichloroethane		93.8	70.0	130.0
1,2-Dichloropropane		86.8	70.0	130.0
1,4-Dioxane		96.5	70.0	130.0
Dichlorodifluoromethane		94.7	70.0	130.0
Dibromochloromethane		108.8	70.0	130.0
trans-1,2-Dichloroethene		96.5	70.0	130.0
cis-1,2-Dichloroethene		100.7	70.0	130.0
cis-1,3-Dichloropropene		97.3	70.0	130.0
1,3-Dichlorobenzene		117.5	70.0	130.0
1,2-Dichlorobenzene		116.6	70.0	130.0
1,4-Dichlorobenzene		116.9	70.0	130.0
trans-1,3-Dichloropropene		97.1	70.0	130.0
Ethanol		116.0	70.0	130.0
Ethylbenzene		105.8	70.0	130.0
Ethyl Acetate		92.3	70.0	130.0
4-Ethyltoluene		114.7	70.0	130.0
Freon 113		97.3	70.0	130.0
Freon 114		96.4	70.0	130.0
Heptane		93.4	70.0	130.0
Hexachlorobutadiene		110.3	70.0	130.0
Hexane		103.1	70.0	130.0
2-Hexanone		97.7	70.0	130.0
Isopropyl Alcohol		87.7	70.0	130.0
Methylene chloride		96.1	70.0	130.0
2-Butanone (MEK)		98.1	70.0	130.0
4-Methyl-2-pentanone (MIBK)		94.3	70.0	130.0
tert-Methyl butyl ether (MTBE)		100.4	70.0	130.0
Methyl methacrylate		86.6	70.0	130.0
Naphthalene		91.2	70.0	130.0
Propylene		86.3	70.0	130.0
Styrene		115.6	70.0	130.0
1,1,1-Trichloroethane		96.1	70.0	130.0
1,1,2,2-Tetrachloroethane		104.5	70.0	130.0
1,1,2-Trichloroethane		99.1	70.0	130.0
1,2,4-Trichlorobenzene		100.2	70.0	130.0
1,2,4-Trimethylbenzene		114.0	70.0	130.0
1,3,5-Trimethylbenzene		113.4	70.0	130.0
2,2,4-Trimethylpentane		92.1	70.0	130.0
Tert-butyl Alcohol		94.4	70.0	130.0
Tetrachloroethene		119.0	70.0	130.0
Tetrahydrofuran		91.0	70.0	130.0
Toluene		98.9	70.0	130.0
Trichloroethene		99.5	70.0	130.0
Trichlorofluoromethane		98.7	70.0	130.0
Vinyl chloride		96.9	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210225G2 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/25/2021 23:32, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Vinyl acetate		90.3	70.0	130.0
p,m-Xylene		112.4	70.0	130.0
o-Xylene		108.4	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210225A8.LCSDG25B, Parent Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:04, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		106.3	70.0	130.0	2.3	30.0
1,3-Butadiene		105.9	70.0	130.0	6.2	30.0
Benzene		98.8	70.0	130.0	0.6	30.0
Bromodichloromethane		99.6	70.0	130.0	4.7	30.0
Bromoform		117.3	70.0	130.0	4.4	30.0
Bromomethane		95.5	70.0	130.0	7.2	30.0
Vinyl bromide		92.2	70.0	130.0	13.0	30.0
Benzyl chloride		104.0	70.0	130.0	8.7	30.0
Carbon disulfide		95.6	70.0	130.0	2.6	30.0
Chlorobenzene		111.9	70.0	130.0	3.9	30.0
Chloroethane		87.8	70.0	130.0	13.8	30.0
Chloroform		101.0	70.0	130.0	5.2	30.0
Chloromethane		93.3	70.0	130.0	1.0	30.0
3-Chloropropene		90.1	70.0	130.0	1.6	30.0
2-Chlorotoluene		109.9	70.0	130.0	4.8	30.0
Carbon tetrachloride		96.6	70.0	130.0	0.9	30.0
Cyclohexane		101.8	70.0	130.0	3.4	30.0
1,1-Dichloroethane		96.9	70.0	130.0	2.9	30.0
1,1-Dichloroethene		93.4	70.0	130.0	1.4	30.0
1,2-Dibromoethane		112.8	70.0	130.0	3.4	30.0
1,2-Dichloroethane		99.1	70.0	130.0	5.5	30.0
1,2-Dichloropropane		89.1	70.0	130.0	2.6	30.0
1,4-Dioxane		97.4	70.0	130.0	0.9	30.0
Dichlorodifluoromethane		94.2	70.0	130.0	0.5	30.0
Dibromochloromethane		113.2	70.0	130.0	4.0	30.0
trans-1,2-Dichloroethene		98.0	70.0	130.0	1.5	30.0
cis-1,2-Dichloroethene		104.8	70.0	130.0	4.0	30.0
cis-1,3-Dichloropropene		99.1	70.0	130.0	1.8	30.0
1,3-Dichlorobenzene		121.0	70.0	130.0	2.9	30.0
1,2-Dichlorobenzene		120.2	70.0	130.0	3.0	30.0
1,4-Dichlorobenzene		123.9	70.0	130.0	5.8	30.0
trans-1,3-Dichloropropene		99.5	70.0	130.0	2.4	30.0
Ethanol		123.1	70.0	130.0	5.9	30.0
Ethylbenzene		111.5	70.0	130.0	5.2	30.0
Ethyl Acetate		106.7	70.0	130.0	14.5	30.0
4-Ethyltoluene		118.0	70.0	130.0	2.8	30.0
Freon 113		98.4	70.0	130.0	1.1	30.0
Freon 114		107.9	70.0	130.0	11.3	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210225G2 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 210225A8.LCSDG25B, Parent Sample ID: 210225A8.LCSG25B

Run in Batch: 210225A8, Run Date: 02/26/2021 00:04, Prep Date: 02/25/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Heptane		95.2	70.0	130.0	1.9	30.0
Hexachlorobutadiene		114.7	70.0	130.0	3.9	30.0
Hexane		102.8	70.0	130.0	0.3	30.0
2-Hexanone		101.6	70.0	130.0	3.9	30.0
Isopropyl Alcohol		93.7	70.0	130.0	6.6	30.0
Methylene chloride		96.1	70.0	130.0	0.0	30.0
2-Butanone (MEK)		98.7	70.0	130.0	0.6	30.0
4-Methyl-2-pentanone (MIBK)		98.7	70.0	130.0	4.6	30.0
tert-Methyl butyl ether (MTBE)		106.7	70.0	130.0	6.1	30.0
Methyl methacrylate		92.2	70.0	130.0	6.3	30.0
Naphthalene		96.3	70.0	130.0	5.4	30.0
Propylene		89.4	70.0	130.0	3.5	30.0
Styrene		115.5	70.0	130.0	0.1	30.0
1,1,1-Trichloroethane		101.5	70.0	130.0	5.5	30.0
1,1,2,2-Tetrachloroethane		109.2	70.0	130.0	4.4	30.0
1,1,2-Trichloroethane		101.7	70.0	130.0	2.6	30.0
1,2,4-Trichlorobenzene		105.6	70.0	130.0	5.2	30.0
1,2,4-Trimethylbenzene		118.1	70.0	130.0	3.5	30.0
1,3,5-Trimethylbenzene		118.1	70.0	130.0	4.1	30.0
2,2,4-Trimethylpentane		92.3	70.0	130.0	0.2	30.0
Tert-butyl Alcohol		101.2	70.0	130.0	7.0	30.0
Tetrachloroethene		118.8	70.0	130.0	0.2	30.0
Tetrahydrofuran		95.7	70.0	130.0	5.0	30.0
Toluene		102.5	70.0	130.0	3.6	30.0
Trichloroethene		100.7	70.0	130.0	1.2	30.0
Trichlorofluoromethane		96.4	70.0	130.0	2.4	30.0
Vinyl chloride		104.7	70.0	130.0	7.7	30.0
Vinyl acetate		96.3	70.0	130.0	6.4	30.0
p,m-Xylene		116.3	70.0	130.0	3.5	30.0
o-Xylene		112.4	70.0	130.0	3.6	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210226G1

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

Blank (BLK)

Lab Sample ID: 210226A8.BLKG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:59, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	2.00	ppbv
1,3-Butadiene		ND	0.20	ppbv
Benzene		ND	0.20	ppbv
Bromodichloromethane		ND	0.20	ppbv
Bromoform		ND	0.20	ppbv
Bromomethane		ND	0.20	ppbv
Vinyl bromide		ND	0.20	ppbv
Benzyl chloride		ND	0.20	ppbv
Carbon disulfide		ND	0.20	ppbv
Chlorobenzene		ND	0.20	ppbv
Chloroethane		ND	2.00	ppbv
Chloroform		ND	0.20	ppbv
Chloromethane		ND	2.00	ppbv
3-Chloropropene		ND	0.20	ppbv
2-Chlorotoluene		ND	0.20	ppbv
Carbon tetrachloride		ND	0.20	ppbv
Cyclohexane		ND	0.20	ppbv
1,1-Dichloroethane		ND	0.20	ppbv
1,1-Dichloroethene		ND	0.20	ppbv
1,2-Dibromoethane		ND	0.20	ppbv
1,2-Dichloroethane		ND	0.20	ppbv
1,2-Dichloropropane		ND	0.20	ppbv
1,4-Dioxane		ND	0.20	ppbv
Dichlorodifluoromethane		ND	0.20	ppbv
Dibromochloromethane		ND	0.20	ppbv
trans-1,2-Dichloroethene		ND	0.20	ppbv
cis-1,2-Dichloroethene		ND	0.20	ppbv
cis-1,3-Dichloropropene		ND	0.20	ppbv
1,3-Dichlorobenzene		ND	0.20	ppbv
1,2-Dichlorobenzene		ND	0.20	ppbv
1,4-Dichlorobenzene		ND	0.20	ppbv
trans-1,3-Dichloropropene		ND	0.20	ppbv
Ethanol	*	4.47	2.00	ppbv
Ethylbenzene		ND	0.20	ppbv
Ethyl Acetate		ND	2.00	ppbv
4-Ethyltoluene		ND	0.20	ppbv
Freon 113		ND	0.20	ppbv
Freon 114		ND	0.20	ppbv
Heptane		ND	0.20	ppbv
Hexachlorobutadiene		ND	0.20	ppbv
Hexane		ND	0.20	ppbv
2-Hexanone		ND	0.20	ppbv
Isopropyl Alcohol		ND	2.00	ppbv
Methylene chloride		ND	0.20	ppbv
2-Butanone (MEK)		ND	2.00	ppbv
4-Methyl-2-pentanone (MIBK)		ND	0.20	ppbv

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210226G1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 210226A8.BLKG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:59, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	Conc	RDL	Units
tert-Methyl butyl ether (MTBE)		ND	0.20	ppbv
Methyl methacrylate		ND	0.20	ppbv
Naphthalene		ND	0.20	ppbv
Propylene		ND	2.00	ppbv
Styrene		ND	0.20	ppbv
1,1,1-Trichloroethane		ND	0.20	ppbv
1,1,2,2-Tetrachloroethane		ND	0.20	ppbv
1,1,2-Trichloroethane		ND	0.20	ppbv
1,2,4-Trichlorobenzene		ND	0.20	ppbv
1,2,4-Trimethylbenzene		ND	0.20	ppbv
1,3,5-Trimethylbenzene		ND	0.20	ppbv
2,2,4-Trimethylpentane		ND	0.20	ppbv
Tert-butyl Alcohol		ND	0.20	ppbv
Tetrachloroethene		ND	0.20	ppbv
Tetrahydrofuran		ND	0.20	ppbv
Toluene		ND	0.20	ppbv
Trichloroethene		ND	0.20	ppbv
Trichlorofluoromethane		ND	0.20	ppbv
Vinyl chloride		ND	0.20	ppbv
Vinyl acetate		ND	0.20	ppbv
p,m-Xylene		ND	0.20	ppbv
o-Xylene		ND	0.20	ppbv

Laboratory Control Sample (LCS)

Lab Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 06:55, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		98.8	70.0	130.0
1,3-Butadiene		105.4	70.0	130.0
Benzene		98.2	70.0	130.0
Bromodichloromethane		98.8	70.0	130.0
Bromoform		114.0	70.0	130.0
Bromomethane		103.7	70.0	130.0
Vinyl bromide		107.9	70.0	130.0
Benzyl chloride		97.8	70.0	130.0
Carbon disulfide		99.2	70.0	130.0
Chlorobenzene		109.2	70.0	130.0
Chloroethane		97.9	70.0	130.0
Chloroform		96.6	70.0	130.0
Chloromethane		92.2	70.0	130.0
3-Chloropropene		89.2	70.0	130.0
2-Chlorotoluene		107.5	70.0	130.0
Carbon tetrachloride		97.1	70.0	130.0
Cyclohexane		97.5	70.0	130.0
1,1-Dichloroethane		93.2	70.0	130.0
1,1-Dichloroethene		101.1	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210226G1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 06:55, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromoethane		110.7	70.0	130.0
1,2-Dichloroethane		95.7	70.0	130.0
1,2-Dichloropropane		87.5	70.0	130.0
1,4-Dioxane		97.4	70.0	130.0
Dichlorodifluoromethane		95.4	70.0	130.0
Dibromochloromethane		111.1	70.0	130.0
trans-1,2-Dichloroethene		97.6	70.0	130.0
cis-1,2-Dichloroethene		102.0	70.0	130.0
cis-1,3-Dichloropropene		96.5	70.0	130.0
1,3-Dichlorobenzene		120.4	70.0	130.0
1,2-Dichlorobenzene		118.4	70.0	130.0
1,4-Dichlorobenzene		119.8	70.0	130.0
trans-1,3-Dichloropropene		98.0	70.0	130.0
Ethanol		124.6	70.0	130.0
Ethylbenzene		109.6	70.0	130.0
Ethyl Acetate		92.5	70.0	130.0
4-Ethyltoluene		116.2	70.0	130.0
Freon 113		100.1	70.0	130.0
Freon 114		97.9	70.0	130.0
Heptane		94.1	70.0	130.0
Hexachlorobutadiene		114.5	70.0	130.0
Hexane		102.1	70.0	130.0
2-Hexanone		98.0	70.0	130.0
Isopropyl Alcohol		92.3	70.0	130.0
Methylene chloride		98.8	70.0	130.0
2-Butanone (MEK)		97.2	70.0	130.0
4-Methyl-2-pentanone (MIBK)		97.2	70.0	130.0
tert-Methyl butyl ether (MTBE)		101.2	70.0	130.0
Methyl methacrylate		88.7	70.0	130.0
Naphthalene		94.0	70.0	130.0
Propylene		85.0	70.0	130.0
Styrene		113.0	70.0	130.0
1,1,1-Trichloroethane		96.9	70.0	130.0
1,1,2,2-Tetrachloroethane		108.1	70.0	130.0
1,1,2-Trichloroethane		99.2	70.0	130.0
1,2,4-Trichlorobenzene		103.0	70.0	130.0
1,2,4-Trimethylbenzene		116.2	70.0	130.0
1,3,5-Trimethylbenzene		115.4	70.0	130.0
2,2,4-Trimethylpentane		91.7	70.0	130.0
Tert-butyl Alcohol		96.7	70.0	130.0
Tetrachloroethene		113.9	70.0	130.0
Tetrahydrofuran		90.7	70.0	130.0
Toluene		100.0	70.0	130.0
Trichloroethene		100.5	70.0	130.0
Trichlorofluoromethane		101.3	70.0	130.0
Vinyl chloride		98.5	70.0	130.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210226G1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 06:55, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Vinyl acetate		90.6	70.0	130.0
p,m-Xylene		114.2	70.0	130.0
o-Xylene		111.2	70.0	130.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210226A8.LCSDG26A, Parent Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:27, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		106.3	70.0	130.0	7.3	30.0
1,3-Butadiene		116.9	70.0	130.0	10.3	30.0
Benzene		98.6	70.0	130.0	0.4	30.0
Bromodichloromethane		99.3	70.0	130.0	0.5	30.0
Bromoform		115.8	70.0	130.0	1.6	30.0
Bromomethane		99.4	70.0	130.0	4.2	30.0
Vinyl bromide		101.5	70.0	130.0	6.1	30.0
Benzyl chloride		100.3	70.0	130.0	2.5	30.0
Carbon disulfide		97.0	70.0	130.0	2.2	30.0
Chlorobenzene		110.5	70.0	130.0	1.2	30.0
Chloroethane		97.4	70.0	130.0	0.5	30.0
Chloroform		102.7	70.0	130.0	6.1	30.0
Chloromethane		95.2	70.0	130.0	3.2	30.0
3-Chloropropene		94.0	70.0	130.0	5.2	30.0
2-Chlorotoluene		107.9	70.0	130.0	0.4	30.0
Carbon tetrachloride		97.4	70.0	130.0	0.3	30.0
Cyclohexane		100.9	70.0	130.0	3.4	30.0
1,1-Dichloroethane		96.9	70.0	130.0	3.9	30.0
1,1-Dichloroethene		98.3	70.0	130.0	2.8	30.0
1,2-Dibromoethane		112.1	70.0	130.0	1.3	30.0
1,2-Dichloroethane		99.9	70.0	130.0	4.3	30.0
1,2-Dichloropropane		88.9	70.0	130.0	1.6	30.0
1,4-Dioxane		99.5	70.0	130.0	2.1	30.0
Dichlorodifluoromethane		94.4	70.0	130.0	1.1	30.0
Dibromochloromethane		112.0	70.0	130.0	0.8	30.0
trans-1,2-Dichloroethene		100.6	70.0	130.0	3.0	30.0
cis-1,2-Dichloroethene		108.7	70.0	130.0	6.4	30.0
cis-1,3-Dichloropropene		97.8	70.0	130.0	1.3	30.0
1,3-Dichlorobenzene		120.9	70.0	130.0	0.4	30.0
1,2-Dichlorobenzene		119.7	70.0	130.0	1.1	30.0
1,4-Dichlorobenzene		121.1	70.0	130.0	1.1	30.0
trans-1,3-Dichloropropene		99.4	70.0	130.0	1.4	30.0
Ethanol	*	130.3	70.0	130.0	4.5	30.0
Ethylbenzene		109.5	70.0	130.0	0.1	30.0
Ethyl Acetate		93.4	70.0	130.0	1.0	30.0
4-Ethyltoluene		116.7	70.0	130.0	0.4	30.0
Freon 113		99.5	70.0	130.0	0.6	30.0
Freon 114		98.7	70.0	130.0	0.8	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: GV210226G1 (continued)

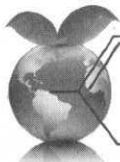
Surrogates: Yes, QC Types: BLK/LCS/LCSD

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 210226A8.LCSDG26A, Parent Sample ID: 210226A8.LCSG26A

Run in Batch: 210226A8, Run Date: 02/26/2021 07:27, Prep Date: 02/26/2021, Matrix: G, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Heptane		95.1	70.0	130.0	1.1	30.0
Hexachlorobutadiene		114.1	70.0	130.0	0.3	30.0
Hexane		86.5	70.0	130.0	16.5	30.0
2-Hexanone		100.4	70.0	130.0	2.4	30.0
Isopropyl Alcohol		95.5	70.0	130.0	3.4	30.0
Methylene chloride		102.2	70.0	130.0	3.4	30.0
2-Butanone (MEK)		104.7	70.0	130.0	7.4	30.0
4-Methyl-2-pentanone (MIBK)		97.6	70.0	130.0	0.4	30.0
tert-Methyl butyl ether (MTBE)		104.1	70.0	130.0	2.8	30.0
Methyl methacrylate		91.9	70.0	130.0	3.5	30.0
Naphthalene		94.4	70.0	130.0	0.4	30.0
Propylene		92.8	70.0	130.0	8.8	30.0
Styrene		113.1	70.0	130.0	0.1	30.0
1,1,1-Trichloroethane		102.7	70.0	130.0	5.8	30.0
1,1,2,2-Tetrachloroethane		107.4	70.0	130.0	0.6	30.0
1,1,2-Trichloroethane		101.1	70.0	130.0	1.9	30.0
1,2,4-Trichlorobenzene		103.7	70.0	130.0	0.7	30.0
1,2,4-Trimethylbenzene		116.5	70.0	130.0	0.3	30.0
1,3,5-Trimethylbenzene		115.8	70.0	130.0	0.3	30.0
2,2,4-Trimethylpentane		92.2	70.0	130.0	0.5	30.0
Tert-butyl Alcohol		102.7	70.0	130.0	6.0	30.0
Tetrachloroethene		115.6	70.0	130.0	1.5	30.0
Tetrahydrofuran		98.2	70.0	130.0	7.9	30.0
Toluene		101.2	70.0	130.0	1.2	30.0
Trichloroethene		100.2	70.0	130.0	0.3	30.0
Trichlorofluoromethane		96.3	70.0	130.0	5.1	30.0
Vinyl chloride		104.3	70.0	130.0	5.7	30.0
Vinyl acetate		97.4	70.0	130.0	7.2	30.0
p,m-Xylene		114.3	70.0	130.0	0.1	30.0
o-Xylene		113.4	70.0	130.0	2.0	30.0



Merit
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C.O.C. PAGE # 1 OF 1

A 4408

REPORT TO

AIR/GAS SAMPLES CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz / Kevin Schneider
 COMPANY Ramboll
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 FAX NO. _____ P.O. NO. _____
 EMAIL ADDRESS clifford.yantz@ramboll.com / kevin.schneider@ramboll.com QUOTE NO. _____

CONTACT NAME SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ EMAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RALER Coldwater Road SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED LEVEL II LEVEL III LEVEL IV EDD OTHER _____

Certifications
 OHIO VAP NELAP
 DoD NPDES

Sample Type

Indoor Air	Ambient Air	Soil Gas	Landfill Gas	Other (specify in notes)	Analyses	
					TO-15	Other (specify in notes)
		X			X	
		X			X	
		X			X	
		X			X	
		X			X	
		X			X	

MERIT LAB NO. FOR LAB USE ONLY	SAMPLE TAG IDENTIFICATION-DESCRIPTION	Start		Stop		Canister Vacuum in Field, "Hg (Start)	Canister Vacuum in Field, "Hg (Stop)	Flow Controller ID	Canister ID
		Date	Time	Date	Time				
21729.01	VP-5D	2/22/21	1149	2/22/21	1159	-26	-2	19	16841
.02	VP-5S	2/22/21	1209	2/22/21	1217	-25	-2	139	23674
.03	VP-5M	2/22/21	1214	2/22/21	1222	-26	-2	223	13719
.04	VP-3S	2/22/21	1625	2/22/21	1642	-28	-4	110	23699
.05	DUP-1	2/22/21	-	2/22/21	-	-28	-4	-	28919
.06	VP-2D	2/23/21	1350	2/23/21	1405	-26	-2	49	25396
/									

Notes

Temperature (Fahrenheit)			Pressure (Inches of Hg)		
Interior	Ambient	Notes	Interior	Ambient	Notes
	36 °F			28.76	
	45 °F			28.90	

RELINQUISHED BY: [Signature] DATE 2/21/21 TIME 1245
 RECEIVED BY: [Signature] DATE 2/22/21 TIME 1245
 RELINQUISHED BY: [Signature] DATE 2/22/21 TIME 1340
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 1340

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 SEAL NO. _____ SEAL INTACT YES NO INITIALS _____
 TEMP. ON ARRIVAL RT



Analytical Laboratory Report

Report ID: S21727.01(01)
Generated on 03/02/2021

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:
Email: Clifford.Yantz@ramboll.com

Additional Contacts: Kevin Schneider

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): S21727.01-S21727.08
Project: RACER Coldwater Road
Collected Date(s): 02/22/2021 - 02/23/2021
Submitted Date/Time: 02/24/2021 13:40
Sampled by: Kevin Schneider
P.O. #: 12000277

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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).

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 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.

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

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
SW5030C/8260C	SW 846 Method 8260C Revision 3 August 2006 / 5030C Revision 3 May 2003



Analytical Laboratory Report

Sample Summary (8 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S21727.01	VP-6S	Groundwater	02/22/21 14:16
S21727.02	VP-6M	Groundwater	02/22/21 14:22
S21727.03	VP-3M	Groundwater	02/22/21 16:54
S21727.04	VP-3D	Groundwater	02/22/21 16:59
S21727.05	VP-1S	Groundwater	02/23/21 10:39
S21727.06	VP-1D	Groundwater	02/23/21 10:42
S21727.07	VP-2S	Groundwater	02/23/21 14:16
S21727.08	Trip Blank-022321	Liquid	02/23/21 00:01



Analytical Laboratory Report

Lab Sample ID: S21727.01

Sample Tag: VP-6S

Collected Date/Time: 02/22/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 19:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.01 (continued)

Sample Tag: VP-6S

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 19:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.02

Sample Tag: VP-6M

Collected Date/Time: 02/22/2021 14:22

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:04, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.02 (continued)

Sample Tag: VP-6M

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:04, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.03

Sample Tag: VP-3M

Collected Date/Time: 02/22/2021 16:54

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:27, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.03 (continued)

Sample Tag: VP-3M

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:27, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.04

Sample Tag: VP-3D

Collected Date/Time: 02/22/2021 16:59

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:50, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.04 (continued)

Sample Tag: VP-3D

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 20:50, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.05

Sample Tag: VP-1S

Collected Date/Time: 02/23/2021 10:39

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
3	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 21:13, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.05 (continued)

Sample Tag: VP-1S

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 21:13, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.06

Sample Tag: VP-1D

Collected Date/Time: 02/23/2021 10:42

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/26/21 14:51, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.06 (continued)

Sample Tag: VP-1D

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/26/21 14:51, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.07

Sample Tag: VP-2S

Collected Date/Time: 02/23/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 21:36, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.07 (continued)

Sample Tag: VP-2S

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 21:36, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		



Analytical Laboratory Report

Lab Sample ID: S21727.08

Sample Tag: Trip Blank-022321

Collected Date/Time: 02/23/2021 00:01

Matrix: Liquid

COC Reference: 125036

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	40ml Glass	HCL	Yes	3.3	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
pH check for VOCs*	<2	N/A	02/26/21 10:00	BML	

Organics - Volatiles

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 14:41, Analyst: KAG

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Acetone	Not detected	50		ug/L	1	67-64-1	
Acrylonitrile	Not detected	2		ug/L	1	107-13-1	
2-Butanone (MEK)	Not detected	25		ug/L	1	78-93-3	
Benzene	Not detected	1		ug/L	1	71-43-2	
n-Butylbenzene	Not detected	1		ug/L	1	104-51-8	
Bromobenzene	Not detected	1		ug/L	1	108-86-1	
Bromochloromethane	Not detected	1		ug/L	1	74-97-5	
Bromodichloromethane	Not detected	1		ug/L	1	75-27-4	
Bromoform	Not detected	1		ug/L	1	75-25-2	
Bromomethane	Not detected	5		ug/L	1	74-83-9	
sec-Butylbenzene	Not detected	1		ug/L	1	135-98-8	
tert-Butylbenzene	Not detected	1		ug/L	1	98-06-6	
Carbon disulfide	Not detected	5		ug/L	1	75-15-0	
Carbon tetrachloride	Not detected	1		ug/L	1	56-23-5	
Chlorobenzene	Not detected	1		ug/L	1	108-90-7	
Chloroethane	Not detected	5		ug/L	1	75-00-3	
Chloroform	Not detected	1		ug/L	1	67-66-3	
Chloromethane	Not detected	5		ug/L	1	74-87-3	
1,1-Dichloroethane	Not detected	1		ug/L	1	75-34-3	
1,1-Dichloroethene	Not detected	1		ug/L	1	75-35-4	
1,2-Dibromo-3-chloropropane	Not detected	5		ug/L	1	96-12-8	
1,2-Dibromoethane	Not detected	1		ug/L	1	106-93-4	
1,2-Dichlorobenzene	Not detected	1		ug/L	1	95-50-1	
1,2-Dichloroethane	Not detected	1		ug/L	1	107-06-2	
1,2-Dichloropropane	Not detected	1		ug/L	1	78-87-5	
1,3-Dichlorobenzene	Not detected	1		ug/L	1	541-73-1	
1,4-Dichlorobenzene	Not detected	1		ug/L	1	106-46-7	
cis-1,2-Dichloroethene	Not detected	1		ug/L	1	156-59-2	
cis-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-01-5	
Dibromochloromethane	Not detected	5		ug/L	1	124-48-1	
Dibromomethane	Not detected	5		ug/L	1	74-95-3	
Dichlorodifluoromethane	Not detected	5		ug/L	1	75-71-8	
Diethyl ether	Not detected	10		ug/L	1	60-29-7	
trans-1,2-Dichloroethene	Not detected	1		ug/L	1	156-60-5	
trans-1,3-Dichloropropene	Not detected	1		ug/L	1	10061-02-6	
trans-1,4-Dichloro-2-butene	Not detected	1		ug/L	1	110-57-6	
Ethylbenzene	Not detected	1		ug/L	1	100-41-4	



Analytical Laboratory Report

Lab Sample ID: S21727.08 (continued)

Sample Tag: Trip Blank-022321

Volatile Organics - DEQ List, Method: SW5030C/8260C, Run Date: 02/25/21 14:41, Analyst: KAG (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
2-Hexanone	Not detected	50		ug/L	1	591-78-6	
Hexachloroethane	Not detected	5		ug/L	1	67-72-1	
p-Isopropyltoluene	Not detected	5		ug/L	1	99-87-6	
Isopropylbenzene	Not detected	5		ug/L	1	98-82-8	
2-Methylnaphthalene	Not detected	5		ug/L	1	91-57-6	
4-Methyl-2-pentanone (MIBK)	Not detected	50		ug/L	1	108-10-1	
tert-Methyl butyl ether (MTBE)	Not detected	5		ug/L	1	1634-04-4	
Methyl iodide	Not detected	1		ug/L	1	74-88-4	
Methylene chloride	Not detected	5		ug/L	1	75-09-2	
Naphthalene	Not detected	5		ug/L	1	91-20-3	
n-Propylbenzene	Not detected	1		ug/L	1	103-65-1	
Styrene	Not detected	1		ug/L	1	100-42-5	
1,1,1,2-Tetrachloroethane	Not detected	1		ug/L	1	630-20-6	
1,1,1-Trichloroethane	Not detected	1		ug/L	1	71-55-6	
1,1,2,2-Tetrachloroethane	Not detected	1		ug/L	1	79-34-5	
1,1,2-Trichloroethane	Not detected	1		ug/L	1	79-00-5	
1,2,3-Trichlorobenzene	Not detected	5		ug/L	1	87-61-6	
1,2,3-Trichloropropane	Not detected	1		ug/L	1	96-18-4	
1,2,3-Trimethylbenzene	Not detected	1		ug/L	1	526-73-8	
1,2,4-Trichlorobenzene	Not detected	5		ug/L	1	120-82-1	
1,2,4-Trimethylbenzene	Not detected	1		ug/L	1	95-63-6	
1,3,5-Trimethylbenzene	Not detected	1		ug/L	1	108-67-8	
Tetrachloroethene	Not detected	1		ug/L	1	127-18-4	
Tetrahydrofuran*	Not detected	90		ug/L	1	109-99-9	
Toluene	Not detected	1		ug/L	1	108-88-3	
Trichloroethene	Not detected	1		ug/L	1	79-01-6	
Trichlorofluoromethane	Not detected	1		ug/L	1	75-69-4	
Vinyl chloride	Not detected	1		ug/L	1	75-01-4	
o-Xylene	Not detected	1		ug/L	1	95-47-6	
p,m-Xylene*	Not detected	2		ug/L	1		

Merit Laboratories Login Checklist

Lab Set ID:S21727

Client:OBG02 (O'Brien & Gere Engineers, Inc.)

Project: RACER Coldwater Road

Submitted:02/24/2021 13:40 Login User: MMC

Attention: Clifford Yantz

Address: O'Brien & Gere Engineers, Inc.
2260 E Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211

FAX:

Email: Clifford.Yantz@ramboll.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 3.3 |
| 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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" 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 type="checkbox"/> No <input checked="" 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: _____



2680 East Lansing Dr., East Lansing, MI 48823
 Phone (517) 332-0167 Fax (517) 332-4034
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

125036

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz / Kevin Schneider
 COMPANY Ramboll
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO. _____

CONTACT NAME X SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RACER Coldwater Road SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

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

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

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER
	DATE	TIME										
21727.01	2/22/21	1416	VP-65	Gw	3		3					X
.02		1422	VP-6M	Gw	3		3					X
.03		1654	VP-3M	Gw	1		1					X
.04		1659	VP-3D	Gw	1		1					X
.05	2/23/21	1039	VP-15	Gw	3		3					X
.06		1042	VP-1D	Gw	2		2					X
.07		1416	VP-2S	Gw	2		2					X
.08		-	Trip Blank - 022321	L	1		1					X

low volume
low volume

RELINQUISHED BY: [Signature] Sampler DATE 2/24/21 TIME 12:45
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 12:45
 RELINQUISHED BY: [Signature] DATE 2/24/21 TIME 13:40
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 13:40

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT INITIALS NOTES: TEMP. ON ARRIVAL 3.3
 YES NO
 SEAL NO. SEAL INTACT INITIALS
 YES NO

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE



Quality Control Report

Report ID: QC-S21727-01
Generated on 03/02/2021

Report to

Attention: Clifford Yantz
O'Brien & Gere Engineers, Inc.
2260 E Saginaw Street
East Lansing, MI 48823

Phone: 313-333-0211 FAX:

Report Produced by

Merit Laboratories
2680 East Lansing Drive
East Lansing, MI 48823

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

Report Summary

Lab Sample ID(s): S21727.01-S21727.08
Project: RACER Coldwater Road
Submitted Date/Time: 02/24/2021 13:40
Sampled by: Kevin Schneider
P.O. #: 12000277

QC Report Sections

- Cover Page (Page 1)
- Analysis Summary (Pages 2-9)
- Prep Batch Summary (Page 10)
- Surrogates per Lab Sample (Pages 11-18)
- Surrogates per QC Sample (Pages 19-20)
- Batch QC Results (Pages 21-30)

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: S21727.01

Sample Tag: VP-6S

Collected Date/Time: 02/22/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 19:41	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.02

Sample Tag: VP-6M

Collected Date/Time: 02/22/2021 14:22

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:04	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.03

Sample Tag: VP-3M

Collected Date/Time: 02/22/2021 16:54

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:27	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.04

Sample Tag: VP-3D

Collected Date/Time: 02/22/2021 16:59

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:50	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.05

Sample Tag: VP-1S

Collected Date/Time: 02/23/2021 10:39

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 21:13	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.06

Sample Tag: VP-1D

Collected Date/Time: 02/23/2021 10:42

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/26/21 14:51	210226A7	VF210226W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.07

Sample Tag: VP-2S

Collected Date/Time: 02/23/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 21:36	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Analysis Summary

Lab Sample ID: S21727.08

Sample Tag: Trip Blank-022321

Collected Date/Time: 02/23/2021 00:01

Matrix: Liquid

COC Reference: 125036

Analysis	Method	Run Date/Time	Batch ID	Prep ID	Surr	QC Types
Organics - Volatiles						
Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 14:41	210225A7	VF210225W1	Yes	BLK/LCS/LCSD

QC Report - Prep Batch Summary

Organics - Volatiles, Prep Batch ID: VF210225W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S21727.01	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 19:41	210225A7
S21727.02	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:04	210225A7
S21727.03	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:27	210225A7
S21727.04	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 20:50	210225A7
S21727.05	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 21:13	210225A7
S21727.07	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 21:36	210225A7
S21727.08	Volatile Organics - DEQ List	SW5030C/8260C	02/25/21 14:41	210225A7

Organics - Volatiles, Prep Batch ID: VF210226W1

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

Sample ID	Analysis	Method	Run Date/Time	Batch ID
S21727.06	Volatile Organics - DEQ List	SW5030C/8260C	02/26/21 14:51	210226A7

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.01

Sample Tag: VP-6S

Collected Date/Time: 02/22/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 19:41, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.6	80.0	124.0
1,2-Dichloroethane-D4		95.3	72.0	125.0
Toluene-D8		93.9	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.02

Sample Tag: VP-6M

Collected Date/Time: 02/22/2021 14:22

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 20:04, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		97.2	80.0	124.0
1,2-Dichloroethane-D4		93.3	72.0	125.0
Toluene-D8		93.8	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.03

Sample Tag: VP-3M

Collected Date/Time: 02/22/2021 16:54

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 20:27, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		98.1	80.0	124.0
1,2-Dichloroethane-D4		98.3	72.0	125.0
Toluene-D8		93.8	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.04

Sample Tag: VP-3D

Collected Date/Time: 02/22/2021 16:59

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 20:50, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.3	80.0	124.0
1,2-Dichloroethane-D4		95.6	72.0	125.0
Toluene-D8		94.3	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.05

Sample Tag: VP-1S

Collected Date/Time: 02/23/2021 10:39

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 21:13, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.6	80.0	124.0
1,2-Dichloroethane-D4		97.0	72.0	125.0
Toluene-D8		94.0	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.06

Sample Tag: VP-1D

Collected Date/Time: 02/23/2021 10:42

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210226A7, Run Date: 02/26/2021 14:51, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.8	80.0	124.0
1,2-Dichloroethane-D4		92.0	72.0	125.0
Toluene-D8		93.5	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.07

Sample Tag: VP-2S

Collected Date/Time: 02/23/2021 14:16

Matrix: Groundwater

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 21:36, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		95.7	80.0	124.0
1,2-Dichloroethane-D4		91.9	72.0	125.0
Toluene-D8		94.1	89.0	112.0

QC Report - Surrogates per Lab Sample

Lab Sample ID: S21727.08

Sample Tag: Trip Blank-022321

Collected Date/Time: 02/23/2021 00:01

Matrix: Liquid

COC Reference: 125036

Organics - Volatiles, Analysis: Volatile Organics - DEQ List

Run in Batch: 210225A7, Run Date: 02/25/2021 14:41, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		97.3	80.0	124.0
1,2-Dichloroethane-D4		95.4	72.0	125.0
Toluene-D8		93.6	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF210225W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 210225A7.BLKW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 14:17, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		97.2	80.0	124.0
1,2-Dichloroethane-D4		92.4	72.0	125.0
Toluene-D8		94.0	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:08, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.9	80.0	124.0
1,2-Dichloroethane-D4		95.9	72.0	125.0
Toluene-D8		94.5	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210225A7.LCSDW25A, Parent Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:31, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.3	80.0	124.0
1,2-Dichloroethane-D4		93.7	72.0	125.0
Toluene-D8		94.2	89.0	112.0

QC Report - Surrogates per QC Sample

Organics - Volatiles, Prep Batch ID: VF210226W1

QC Types: BLK/LCS/LCSD

Blank (BLK)

Lab Sample ID: 210226A7.BLKW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 12:32, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.8	80.0	124.0
1,2-Dichloroethane-D4		88.2	72.0	125.0
Toluene-D8		93.4	89.0	112.0

Laboratory Control Sample (LCS)

Lab Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:23, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		96.0	80.0	124.0
1,2-Dichloroethane-D4		97.6	72.0	125.0
Toluene-D8		94.5	89.0	112.0

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210226A7.LCSDW26A, Parent Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:46, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Surrogate	Flags	%Rec	LCL	UCL
4-Bromofluorobenzene		98.0	80.0	124.0
1,2-Dichloroethane-D4		99.7	72.0	125.0
Toluene-D8		94.5	89.0	112.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210225W1

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

Blank (BLK)

Lab Sample ID: 210225A7.BLKW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 14:17, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210225W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 210225A7.BLKW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 14:17, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:08, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		119.0	29.9	161.5
Acrylonitrile		119.2	69.9	128.9
2-Butanone (MEK)		114.3	44.0	134.4
Benzene		102.2	79.9	124.9
n-Butylbenzene		88.7	80.0	133.3
Bromobenzene		103.8	78.7	124.6
Bromochloromethane		110.9	78.2	120.8
Bromodichloromethane		109.6	80.4	128.2
Bromoform		114.4	69.4	128.0
Bromomethane		94.0	56.8	151.3
sec-Butylbenzene		89.2	77.4	129.8
tert-Butylbenzene		93.3	80.7	128.9
Carbon disulfide		105.6	63.8	137.4
Carbon tetrachloride		97.8	72.6	133.0
Chlorobenzene		101.9	79.2	122.7
Chloroethane		90.8	53.4	149.4
Chloroform		106.9	78.4	124.0
Chloromethane		86.4	23.8	166.5
1,1-Dichloroethane		106.2	71.5	126.2
1,1-Dichloroethene		107.0	69.6	139.4

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210225W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:08, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		109.1	21.2	189.4
1,2-Dibromoethane		108.0	70.3	133.7
1,2-Dichlorobenzene		101.0	10.0	166.2
1,2-Dichloroethane		102.0	76.0	126.3
1,2-Dichloropropane		109.3	78.6	126.4
1,3-Dichlorobenzene		97.6	77.0	131.3
1,4-Dichlorobenzene		97.5	20.7	137.7
cis-1,2-Dichloroethene		104.4	76.6	122.1
cis-1,3-Dichloropropene		111.1	79.8	129.9
Dibromochloromethane		111.8	74.6	127.2
Dibromomethane		110.9	76.9	122.1
Dichlorodifluoromethane		78.6	10.0	222.8
Diethyl ether	*	121.3	67.4	121.2
trans-1,2-Dichloroethene		101.8	73.6	129.3
trans-1,3-Dichloropropene		112.7	74.0	131.3
trans-1,4-Dichloro-2-butene	*	136.8	68.6	135.4
Ethylbenzene		97.8	79.5	129.1
2-Hexanone		111.8	55.4	136.9
Hexachloroethane		93.8	23.8	138.1
p-Isopropyltoluene		89.4	79.8	137.5
Isopropylbenzene		95.3	74.4	121.5
2-Methylnaphthalene		110.2	25.5	165.5
4-Methyl-2-pentanone (MIBK)		110.4	71.6	125.2
tert-Methyl butyl ether (MTBE)		111.3	73.2	122.4
Methyl iodide		110.5	68.8	116.4
Methylene chloride		111.7	73.3	121.1
Naphthalene		107.6	32.9	135.8
n-Propylbenzene		94.6	82.0	130.7
Styrene		103.8	69.5	126.7
1,1,1,2-Tetrachloroethane		103.0	80.3	128.2
1,1,1-Trichloroethane		98.4	79.4	130.9
1,1,2,2-Tetrachloroethane		110.0	79.8	126.3
1,1,2-Trichloroethane		116.3	78.7	123.1
1,2,3-Trichlorobenzene		108.2	75.4	131.4
1,2,3-Trichloropropane		107.2	78.3	138.8
1,2,3-Trimethylbenzene		94.4	76.3	124.2
1,2,4-Trichlorobenzene		103.7	27.4	143.4
1,2,4-Trimethylbenzene		97.9	81.4	130.8
1,3,5-Trimethylbenzene		96.8	81.3	128.9
Tetrachloroethene		100.4	74.5	124.5
Tetrahydrofuran		114.2	59.0	117.9
Toluene		104.1	79.8	124.5
Trichloroethene		99.5	79.7	124.2
Trichlorofluoromethane		100.9	59.7	151.8
Vinyl chloride		90.3	43.5	149.1
o-Xylene		98.7	80.2	131.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210225W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:08, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		99.2	79.4	132.2

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210225A7.LCSDW25A, Parent Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:31, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone		109.5	29.9	161.5	8.3	30.0
Acrylonitrile		113.7	69.9	128.9	4.7	30.0
2-Butanone (MEK)		108.6	44.0	134.4	5.1	30.0
Benzene		99.7	79.9	124.9	2.4	30.0
n-Butylbenzene		90.0	80.0	133.3	1.4	30.0
Bromobenzene		102.5	78.7	124.6	1.2	30.0
Bromochloromethane		108.7	78.2	120.8	2.0	30.0
Bromodichloromethane		108.5	80.4	128.2	1.0	30.0
Bromoform		114.3	69.4	128.0	0.1	30.0
Bromomethane		90.1	56.8	151.3	4.3	30.0
sec-Butylbenzene		89.5	77.4	129.8	0.4	30.0
tert-Butylbenzene		93.7	80.7	128.9	0.4	30.0
Carbon disulfide		101.9	63.8	137.4	3.6	30.0
Carbon tetrachloride		95.9	72.6	133.0	1.9	30.0
Chlorobenzene		99.6	79.2	122.7	2.2	30.0
Chloroethane		88.2	53.4	149.4	2.9	30.0
Chloroform		104.2	78.4	124.0	2.6	30.0
Chloromethane		82.3	23.8	166.5	4.9	30.0
1,1-Dichloroethane		102.9	71.5	126.2	3.2	30.0
1,1-Dichloroethene		103.4	69.6	139.4	3.4	30.0
1,2-Dibromo-3-chloropropane		108.7	21.2	189.4	0.3	30.0
1,2-Dibromoethane		108.3	70.3	133.7	0.2	30.0
1,2-Dichlorobenzene		102.4	10.0	166.2	1.4	30.0
1,2-Dichloroethane		101.7	76.0	126.3	0.3	30.0
1,2-Dichloropropane		106.4	78.6	126.4	2.7	30.0
1,3-Dichlorobenzene		97.7	77.0	131.3	0.1	30.0
1,4-Dichlorobenzene		97.1	20.7	137.7	0.4	30.0
cis-1,2-Dichloroethene		102.3	76.6	122.1	2.0	30.0
cis-1,3-Dichloropropene		107.9	79.8	129.9	2.9	30.0
Dibromochloromethane		110.4	74.6	127.2	1.3	30.0
Dibromomethane		110.2	76.9	122.1	0.7	30.0
Dichlorodifluoromethane		74.4	10.0	222.8	5.6	30.0
Diethyl ether		117.9	67.4	121.2	2.9	30.0
trans-1,2-Dichloroethene		97.3	73.6	129.3	4.5	30.0
trans-1,3-Dichloropropene		110.8	74.0	131.3	1.8	30.0
trans-1,4-Dichloro-2-butene		130.3	68.6	135.4	4.9	30.0
Ethylbenzene		95.9	79.5	129.1	2.0	30.0
2-Hexanone		109.7	55.4	136.9	1.9	30.0
Hexachloroethane		94.9	23.8	138.1	1.2	30.0
p-Isopropyltoluene		91.4	79.8	137.5	2.2	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210225W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 210225A7.LCSDW25A, Parent Sample ID: 210225A7.LCSW25A

Run in Batch: 210225A7, Run Date: 02/25/2021 13:31, Prep Date: 02/25/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		94.4	74.4	121.5	0.9	30.0
2-Methylnaphthalene		120.0	25.5	165.5	8.5	30.0
4-Methyl-2-pentanone (MIBK)		109.0	71.6	125.2	1.3	30.0
tert-Methyl butyl ether (MTBE)		110.4	73.2	122.4	0.8	30.0
Methyl iodide		107.1	68.8	116.4	3.1	30.0
Methylene chloride		108.3	73.3	121.1	3.0	30.0
Naphthalene		111.6	32.9	135.8	3.6	30.0
n-Propylbenzene		93.1	82.0	130.7	1.6	30.0
Styrene		102.5	69.5	126.7	1.3	30.0
1,1,1,2-Tetrachloroethane		103.3	80.3	128.2	0.4	30.0
1,1,1-Trichloroethane		96.1	79.4	130.9	2.3	30.0
1,1,2,2-Tetrachloroethane		110.3	79.8	126.3	0.3	30.0
1,1,2-Trichloroethane		115.3	78.7	123.1	0.9	30.0
1,2,3-Trichlorobenzene		112.3	75.4	131.4	3.6	30.0
1,2,3-Trichloropropane		106.3	78.3	138.8	0.8	30.0
1,2,3-Trimethylbenzene		96.4	76.3	124.2	2.1	30.0
1,2,4-Trichlorobenzene		107.4	27.4	143.4	3.6	30.0
1,2,4-Trimethylbenzene		97.5	81.4	130.8	0.5	30.0
1,3,5-Trimethylbenzene		96.5	81.3	128.9	0.3	30.0
Tetrachloroethene		99.6	74.5	124.5	0.8	30.0
Tetrahydrofuran		108.8	59.0	117.9	4.8	30.0
Toluene		101.0	79.8	124.5	3.0	30.0
Trichloroethene		98.1	79.7	124.2	1.4	30.0
Trichlorofluoromethane		96.6	59.7	151.8	4.4	30.0
Vinyl chloride		85.6	43.5	149.1	5.3	30.0
o-Xylene		98.1	80.2	131.0	0.6	30.0
p,m-Xylene		96.6	79.4	132.2	2.7	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210226W1

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

Blank (BLK)

Lab Sample ID: 210226A7.BLKW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 12:32, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Acetone		ND	10.00	ug/l
Acrylonitrile		ND	1.00	ug/l
2-Butanone (MEK)		ND	10.00	ug/l
Benzene		ND	1.00	ug/l
n-Butylbenzene		ND	1.00	ug/l
Bromobenzene		ND	1.00	ug/l
Bromochloromethane		ND	1.00	ug/l
Bromodichloromethane		ND	1.00	ug/l
Bromoform		ND	1.00	ug/l
Bromomethane		ND	1.00	ug/l
sec-Butylbenzene		ND	1.00	ug/l
tert-Butylbenzene		ND	1.00	ug/l
Carbon disulfide		ND	1.00	ug/l
Carbon tetrachloride		ND	1.00	ug/l
Chlorobenzene		ND	1.00	ug/l
Chloroethane		ND	1.00	ug/l
Chloroform		ND	1.00	ug/l
Chloromethane		ND	1.00	ug/l
1,1-Dichloroethane		ND	1.00	ug/l
1,1-Dichloroethene		ND	1.00	ug/l
1,2-Dibromo-3-chloropropane		ND	1.00	ug/l
1,2-Dibromoethane		ND	1.00	ug/l
1,2-Dichlorobenzene		ND	1.00	ug/l
1,2-Dichloroethane		ND	1.00	ug/l
1,2-Dichloropropane		ND	1.00	ug/l
1,3-Dichlorobenzene		ND	1.00	ug/l
1,4-Dichlorobenzene		ND	1.00	ug/l
cis-1,2-Dichloroethene		ND	1.00	ug/l
cis-1,3-Dichloropropene		ND	1.00	ug/l
Dibromochloromethane		ND	1.00	ug/l
Dibromomethane		ND	1.00	ug/l
Dichlorodifluoromethane		ND	1.00	ug/l
Diethyl ether		ND	1.00	ug/l
trans-1,2-Dichloroethene		ND	1.00	ug/l
trans-1,3-Dichloropropene		ND	1.00	ug/l
trans-1,4-Dichloro-2-butene		ND	1.00	ug/l
Ethylbenzene		ND	1.00	ug/l
2-Hexanone		ND	10.00	ug/l
Hexachloroethane		ND	1.00	ug/l
p-Isopropyltoluene		ND	1.00	ug/l
Isopropylbenzene		ND	1.00	ug/l
2-Methylnaphthalene		ND	1.00	ug/l
4-Methyl-2-pentanone (MIBK)		ND	10.00	ug/l
tert-Methyl butyl ether (MTBE)		ND	1.00	ug/l
Methyl iodide		ND	1.00	ug/l
Methylene chloride		ND	1.00	ug/l

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210226W1 (continued)

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

Blank (BLK) (continued)

Lab Sample ID: 210226A7.BLKW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 12:32, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	Conc	RDL	Units
Naphthalene		ND	1.00	ug/l
n-Propylbenzene		ND	1.00	ug/l
Styrene		ND	1.00	ug/l
1,1,1,2-Tetrachloroethane		ND	1.00	ug/l
1,1,1-Trichloroethane		ND	1.00	ug/l
1,1,2,2-Tetrachloroethane		ND	1.00	ug/l
1,1,2-Trichloroethane		ND	1.00	ug/l
1,2,3-Trichlorobenzene		ND	1.00	ug/l
1,2,3-Trichloropropane		ND	1.00	ug/l
1,2,3-Trimethylbenzene		ND	1.00	ug/l
1,2,4-Trichlorobenzene		ND	1.00	ug/l
1,2,4-Trimethylbenzene		ND	1.00	ug/l
1,3,5-Trimethylbenzene		ND	1.00	ug/l
Tetrachloroethene		ND	1.00	ug/l
Tetrahydrofuran		ND	10.00	ug/l
Toluene		ND	1.00	ug/l
Trichloroethene		ND	1.00	ug/l
Trichlorofluoromethane		ND	1.00	ug/l
Vinyl chloride		ND	1.00	ug/l
o-Xylene		ND	1.00	ug/l
p,m-Xylene		ND	1.00	ug/l

Laboratory Control Sample (LCS)

Lab Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:23, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
Acetone		69.1	29.9	161.5
Acrylonitrile		107.8	69.9	128.9
2-Butanone (MEK)		102.7	44.0	134.4
Benzene		100.2	79.9	124.9
n-Butylbenzene		91.0	80.0	133.3
Bromobenzene		102.1	78.7	124.6
Bromochloromethane		108.7	78.2	120.8
Bromodichloromethane		107.2	80.4	128.2
Bromoform		109.5	69.4	128.0
Bromomethane		95.2	56.8	151.3
sec-Butylbenzene		91.5	77.4	129.8
tert-Butylbenzene		94.3	80.7	128.9
Carbon disulfide		105.3	63.8	137.4
Carbon tetrachloride		96.7	72.6	133.0
Chlorobenzene		101.3	79.2	122.7
Chloroethane		92.3	53.4	149.4
Chloroform		105.1	78.4	124.0
Chloromethane		87.2	23.8	166.5
1,1-Dichloroethane		104.2	71.5	126.2
1,1-Dichloroethene		103.9	69.6	139.4

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210226W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:23, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
1,2-Dibromo-3-chloropropane		100.3	21.2	189.4
1,2-Dibromoethane		103.5	70.3	133.7
1,2-Dichlorobenzene		100.7	10.0	166.2
1,2-Dichloroethane		99.1	76.0	126.3
1,2-Dichloropropane		106.5	78.6	126.4
1,3-Dichlorobenzene		97.6	77.0	131.3
1,4-Dichlorobenzene		96.8	20.7	137.7
cis-1,2-Dichloroethene		103.5	76.6	122.1
cis-1,3-Dichloropropene		107.3	79.8	129.9
Dibromochloromethane		107.9	74.6	127.2
Dibromomethane		107.0	76.9	122.1
Dichlorodifluoromethane		72.2	10.0	222.8
Diethyl ether		115.7	67.4	121.2
trans-1,2-Dichloroethene		99.8	73.6	129.3
trans-1,3-Dichloropropene		108.3	74.0	131.3
trans-1,4-Dichloro-2-butene		109.8	68.6	135.4
Ethylbenzene		97.2	79.5	129.1
2-Hexanone		103.5	55.4	136.9
Hexachloroethane		96.4	23.8	138.1
p-Isopropyltoluene		91.7	79.8	137.5
Isopropylbenzene		95.7	74.4	121.5
2-Methylnaphthalene		116.0	25.5	165.5
4-Methyl-2-pentanone (MIBK)		103.0	71.6	125.2
tert-Methyl butyl ether (MTBE)		110.4	73.2	122.4
Methyl iodide		108.5	68.8	116.4
Methylene chloride		108.9	73.3	121.1
Naphthalene		104.2	32.9	135.8
n-Propylbenzene		95.0	82.0	130.7
Styrene		102.6	69.5	126.7
1,1,1,2-Tetrachloroethane		102.7	80.3	128.2
1,1,1-Trichloroethane		98.0	79.4	130.9
1,1,2,2-Tetrachloroethane		104.1	79.8	126.3
1,1,2-Trichloroethane		111.4	78.7	123.1
1,2,3-Trichlorobenzene		108.4	75.4	131.4
1,2,3-Trichloropropane		101.4	78.3	138.8
1,2,3-Trimethylbenzene		98.1	76.3	124.2
1,2,4-Trichlorobenzene		103.9	27.4	143.4
1,2,4-Trimethylbenzene		98.0	81.4	130.8
1,3,5-Trimethylbenzene		98.1	81.3	128.9
Tetrachloroethene		101.4	74.5	124.5
Tetrahydrofuran		99.2	59.0	117.9
Toluene		102.4	79.8	124.5
Trichloroethene		98.9	79.7	124.2
Trichlorofluoromethane		98.7	59.7	151.8
Vinyl chloride		88.3	43.5	149.1
o-Xylene		98.6	80.2	131.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210226W1 (continued)

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

Laboratory Control Sample (LCS) (continued)

Lab Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:23, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL
p,m-Xylene		98.7	79.4	132.2

Laboratory Control Sample Duplicate (LCSD)

Lab Sample ID: 210226A7.LCSDW26A, Parent Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:46, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Acetone	*	107.1	29.9	161.5	43.2	30.0
Acrylonitrile		111.0	69.9	128.9	2.9	30.0
2-Butanone (MEK)		105.9	44.0	134.4	3.1	30.0
Benzene		99.8	79.9	124.9	0.4	30.0
n-Butylbenzene		89.9	80.0	133.3	1.2	30.0
Bromobenzene		103.9	78.7	124.6	1.8	30.0
Bromochloromethane		110.4	78.2	120.8	1.6	30.0
Bromodichloromethane		107.0	80.4	128.2	0.2	30.0
Bromoform		110.7	69.4	128.0	1.0	30.0
Bromomethane		92.6	56.8	151.3	2.8	30.0
sec-Butylbenzene		89.6	77.4	129.8	2.2	30.0
tert-Butylbenzene		94.7	80.7	128.9	0.4	30.0
Carbon disulfide		102.1	63.8	137.4	3.0	30.0
Carbon tetrachloride		95.5	72.6	133.0	1.2	30.0
Chlorobenzene		100.4	79.2	122.7	0.8	30.0
Chloroethane		91.0	53.4	149.4	1.4	30.0
Chloroform		105.3	78.4	124.0	0.2	30.0
Chloromethane		79.2	23.8	166.5	9.6	30.0
1,1-Dichloroethane		104.5	71.5	126.2	0.4	30.0
1,1-Dichloroethene		101.8	69.6	139.4	2.0	30.0
1,2-Dibromo-3-chloropropane		102.7	21.2	189.4	2.4	30.0
1,2-Dibromoethane		107.4	70.3	133.7	3.7	30.0
1,2-Dichlorobenzene		101.4	10.0	166.2	0.7	30.0
1,2-Dichloroethane		101.7	76.0	126.3	2.6	30.0
1,2-Dichloropropane		106.3	78.6	126.4	0.2	30.0
1,3-Dichlorobenzene		96.7	77.0	131.3	0.9	30.0
1,4-Dichlorobenzene		96.8	20.7	137.7	0.0	30.0
cis-1,2-Dichloroethene		103.9	76.6	122.1	0.4	30.0
cis-1,3-Dichloropropene		107.8	79.8	129.9	0.4	30.0
Dibromochloromethane		111.1	74.6	127.2	2.9	30.0
Dibromomethane		109.9	76.9	122.1	2.7	30.0
Dichlorodifluoromethane		70.7	10.0	222.8	2.1	30.0
Diethyl ether		120.3	67.4	121.2	3.9	30.0
trans-1,2-Dichloroethene		100.0	73.6	129.3	0.3	30.0
trans-1,3-Dichloropropene		109.6	74.0	131.3	1.2	30.0
trans-1,4-Dichloro-2-butene		90.2	68.6	135.4	19.6	30.0
Ethylbenzene		96.5	79.5	129.1	0.7	30.0
2-Hexanone		107.5	55.4	136.9	3.8	30.0
Hexachloroethane		93.6	23.8	138.1	2.9	30.0
p-Isopropyltoluene		91.2	79.8	137.5	0.5	30.0

QC Report - Batch QC Results

Organics - Volatiles, Prep Batch ID: VF210226W1 (continued)

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

Laboratory Control Sample Duplicate (LCSD) (continued)

Lab Sample ID: 210226A7.LCSDW26A, Parent Sample ID: 210226A7.LCSW26A

Run in Batch: 210226A7, Run Date: 02/26/2021 11:46, Prep Date: 02/26/2021, Matrix: WW, Dilution: 1

Analyte	Flags	% Rec	LCL	UCL	RPD	RPD CL
Isopropylbenzene		95.3	74.4	121.5	0.5	30.0
2-Methylnaphthalene		121.8	25.5	165.5	4.9	30.0
4-Methyl-2-pentanone (MIBK)		105.9	71.6	125.2	2.8	30.0
tert-Methyl butyl ether (MTBE)		114.6	73.2	122.4	3.8	30.0
Methyl iodide		107.5	68.8	116.4	0.9	30.0
Methylene chloride		109.6	73.3	121.1	0.7	30.0
Naphthalene		108.3	32.9	135.8	3.8	30.0
n-Propylbenzene		95.6	82.0	130.7	0.6	30.0
Styrene		103.0	69.5	126.7	0.3	30.0
1,1,1,2-Tetrachloroethane		104.3	80.3	128.2	1.5	30.0
1,1,1-Trichloroethane		97.6	79.4	130.9	0.4	30.0
1,1,2,2-Tetrachloroethane		108.9	79.8	126.3	4.5	30.0
1,1,2-Trichloroethane		113.7	78.7	123.1	2.0	30.0
1,2,3-Trichlorobenzene		110.8	75.4	131.4	2.2	30.0
1,2,3-Trichloropropane		104.8	78.3	138.8	3.3	30.0
1,2,3-Trimethylbenzene		98.6	76.3	124.2	0.5	30.0
1,2,4-Trichlorobenzene		107.1	27.4	143.4	3.1	30.0
1,2,4-Trimethylbenzene		98.4	81.4	130.8	0.4	30.0
1,3,5-Trimethylbenzene		98.2	81.3	128.9	0.1	30.0
Tetrachloroethene		99.3	74.5	124.5	2.1	30.0
Tetrahydrofuran		101.6	59.0	117.9	2.3	30.0
Toluene		100.5	79.8	124.5	1.9	30.0
Trichloroethene		98.6	79.7	124.2	0.3	30.0
Trichlorofluoromethane		98.3	59.7	151.8	0.4	30.0
Vinyl chloride		86.4	43.5	149.1	2.2	30.0
o-Xylene		99.4	80.2	131.0	0.8	30.0
p,m-Xylene		97.8	79.4	132.2	1.0	30.0



2680 East Lansing Dr., East Lansing, MI 48823
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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

125036

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Clifford Yantz / Kevin Schneider
 COMPANY Ramboll
 ADDRESS 2260 East Saginaw
 CITY East Lansing STATE MI ZIP CODE 48823
 PHONE NO. 313-333-0211 FAX NO. _____ P.O. NO. _____
 E-MAIL ADDRESS Clifford.Yantz@Ramboll.com / Kevin.Schneider@Ramboll.com QUOTE NO. _____

CONTACT NAME X SAME
 COMPANY _____
 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
 PHONE NO. _____ E-MAIL ADDRESS _____

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME RACER Coldwater Road SAMPLER(S) - PLEASE PRINT/SIGN NAME Kevin Schneider
 TURNAROUND TIME REQUIRED 1 DAY 2 DAYS 3 DAYS STANDARD OTHER _____
 DELIVERABLES REQUIRED STD LEVEL II LEVEL III LEVEL IV EDD OTHER _____

- Certifications
 OHIO VAP Drinking Water
 DoD NPDES
 Project Locations
 Detroit New York
 Other _____
 Special Instructions

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

Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER							
	DATE	TIME																	
21727.01	2/22/21	1416	VP-65	Gw	3		3						X						
.02		1422	VP-6M	Gw	3		3						X						
.03		1654	VP-3M	Gw	1		1						X						low volume
.04		1659	VP-3D	Gw	1		1						X						low volume
.05	2/23/21	1039	VP-15	Gw	3		3						X						
.06		1042	VP-1D	Gw	2		2						X						
.07		1416	VP-2S	Gw	2		2						X						
.08		-	Trip Blank - 022321	L	1		1						X						

RELINQUISHED BY: [Signature] Sampler DATE 2/24/21 TIME 12:45
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 12:45
 RELINQUISHED BY: [Signature] DATE 2/24/21 TIME 13:40
 RECEIVED BY: [Signature] DATE 2/24/21 TIME 13:40

RELINQUISHED BY: _____ DATE _____ TIME _____
 RECEIVED BY: _____ DATE _____ TIME _____
 SEAL NO. SEAL INTACT INITIALS NOTES: TEMP. ON ARRIVAL 3.3
 YES NO
 SEAL NO. SEAL INTACT INITIALS
 YES NO

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

APPENDIX C
Site-specific VIAC criteria & Transmittal Letter



GRETCHEN WHITMER
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY
LANSING



LIESL EICHLER CLARK
DIRECTOR

October 22, 2020

VIA E-MAIL AND U.S. MAIL

Mr. David Favero
Deputy Cleanup Manager - Michigan
RACER Trust
500 Woodward Avenue, Suite 2650
Detroit, Michigan 48226

Dear Mr. Favero,

SUBJECT: Transmittal of Site-Specific Volatilization to Indoor Air Criteria:
Revitalizing Auto Communities Environmental Response (RACER) Trust,
Coldwater Road Landfill; Flint, Michigan; MID 005 356 860; Waste Data
System Number 393431

The purpose of this letter is to transmit Michigan Department of Environment, Great Lakes, and Energy (EGLE), Materials Management Division (MMD), site-specific criteria for soil, groundwater, soil gas, and indoor air for the compounds on the Target Analyte List. The site-specific criteria for various scenarios are attached, as described below:

- The site-specific soil, groundwater, and soil gas criteria for residential houses constructed with a crawlspace with a dirt floor and groundwater three feet below grade are attached as Table 1.
- The site-specific soil, groundwater, and soil gas criteria for residential houses constructed as slab-on-grade and groundwater three feet below grade are attached as Table 2.
- The site-specific soil, groundwater, and soil gas criteria for residential houses constructed with a basement and groundwater three feet below grade are attached as Table 3.

EGLE developed the site-specific soil, groundwater, and soil gas criteria using values that better reflect best available information regarding facility geology and hydrogeology, building-specific information, and the toxicity and exposure risks posed by the hazardous substances present at the facility.

Provided that the conditions used to develop the site-specific criteria are met, the values may be used without further EGLE, MMD approval. As always, please maintain records to document that the site-specific criteria were used as intended and approved.

If desired, RACER may initiate the development of other site-specific criteria, using additional site-specific information consistent with the statutory provisions for development of site-specific criteria of Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Such a process will require EGLE, MMD involvement, and any other site-specific criteria developed will require EGLE, MMD review and approval.

The site-specific criteria should be used to evaluate groundwater, soil, soil gas, and sub-slab soil gas collected as part of any volatilization to indoor air pathway investigation. In addition, the indoor air data should be evaluated against the Recommended Interim Action Screening Levels and the Time-Sensitive Recommended Interim Action Screening Levels (TS RIASL). Concentrations in sub-slab soil gas greater than the site-specific criteria should be interpreted as indicative of a potential long-term source of inhalation exposure risk. The exceedance of an indoor air TS RIASL will require more rapid exposure mitigation, such as immediately increased ventilation, and/or may require collaboration with the Michigan Department of Health and Human Services, and/or the Genesee County Health Department.

Should you have any questions, please contact me at 517-284-6580; RungeJ@Michigan.gov; or EGLE, MMD, P.O. Box 30241, Lansing, MI 48909-7741.

Sincerely,



Jacob Runge, Environmental Engineer
Management and Tracking Unit
Hazardous Waste Section
Materials Management Division

Enclosures

cc: Mr. Clifford Yantz, Senior Hydrogeologist, Ramboll
Mr. Kevin Schneider, Environmental Scientist, Ramboll
Mr. Rich Conforti, EGLE
Mr. John McCabe, EGLE
Ms. Nicole Sanabria, EGLE
cc/encl: Corrective Action File

DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY

INTEROFFICE COMMUNICATION

TO: Nicole Sanabria, Geologist, MMD

FROM: Shane Morrison, Senior Toxicologist, RRD

DATE: January 6, 2020

SUBJECT: Coldwater Road Landfill Site-Specific Criteria Evaluation



The following site-specific volatilization to indoor air criteria (VIAC) are the Michigan Department of Environment, Great Lakes, and Energy's (EGLE's) determination of values that reflect best available information regarding the toxicity and exposure risks posed by the hazardous substances present at the facility. These values are based upon the information provided with the request to develop site-specific VIAC for this facility. These values may be used provided it is documented that the conditions used to develop the site-specific criteria are met at the facility. Other values may be developed by a person consistent with the statutory provisions for development of site-specific criteria and provided for EGLE review and approval.

Correspondence transmitting these values to the submitter/consultant as part of a report, review, or other request must incorporate the appropriate sections of the VIAP model document language. As indicated in this document, when GVIC and SVIC are not applicable, the correspondence must include language indicating the requirement to satisfy the site-specific VIAC for all three media i.e., groundwater, soil, and soil gas. In addition, all of the following site-specific VIAC tables must be copied into the correspondence or letter as part of your response to the submitter/consultant.

Unrestricted residential site-specific criteria were included in the evaluation based on information provided and EGLE's residential conceptual site model. Exceedance of the site-specific unrestricted residential criteria will require restrictions or institutional controls for closure or aid in the determination of off-site migration.

If multiple foundation types are present for a structure (i.e. slab-on-grade, crawlspace, and/or basement), a sensitivity analysis should be performed to identify the most restrictive set of criteria to evaluate risk associated with the VIAP for that structure.

The site-specific criteria were generated using the United States Department of Agriculture (USDA) soil type of sand. Other site-specific criteria can be generated using a different soil type by providing soil characterization results from department approved methods on soils collected at the site.

Additional hazardous substances were included in the site-specific evaluation that were not explicitly requested. These hazardous substances may be components of recent petroleum releases and the primary breakdown products of tetrachloroethylene. The preemptive site-specific evaluation of these substances was provided to limit the potential need for future resubmittal for this facility.

Please contact me at MorrisonS5@michigan.gov or 517-284-5063 if you require any clarification of these comments and criterion or have additional questions.

cc: Eric Wildfang, Toxicology Unit Supervisor, RRD
Virginia Himich, Environmental Manager, MMD
Joe Rogers, Environmental Quality Specialist, MMD
Jacob Runge, Environmental Engineer, MMD

John McCabe, Senior Environmental Quality Analyst, MMD

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **restricted** site-specific criteria that apply to a residential house with a **crawlspace with a dirt floor**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
83329	Acenaphthene	130 nc	48,000 nc	220 nc
208968	Acenaphthylene	65 nc	DATA	220 nc
994058	t-Amyl methyl ether (TAME)	3.9 (M) nc	DATA	65 nc
120127	Anthracene	43 (S) sol	4.1E+06 nc	1,000 nc
71432	Benzene	0.14 (M) ca	0.21 (M) ca	3.3 ca
56553	Benzo(a)anthracene	2.7 (MM) mut	89,000 (MM) mut	0.17 (MM) mut
78933	2-Butanone (MEK)	2,600 (DD) dev	3,800 (DD) dev	5,000 (DD) dev
75650	t-Butyl alcohol	230 nc	DATA	75 nc
104518	n-Butylbenzene	9.9 nc	120 nc	210 nc
135988	sec-Butylbenzene	8.1 nc	840 nc	0.42 nc
98066	t-Butylbenzene	1.9E-02 (M) nc	0.14 (M) nc	0.42 nc
110827	Cyclohexane	230 nc	44 (M) nc	6,300 nc
124481	Dibromochloromethane	4.0E-02 (MM) (M) mut	0.14 (MM) (M) mut	0.43 (MM) mut
95501	1,2-Dichlorobenzene	23 nc	310 nc	310 nc
541731	1,3-Dichlorobenzene	0.19 (M) nc	2.1 (M) nc	3.1 nc
106467	1,4-Dichlorobenzene	0.42 (M) ca	5.0 (M) ca	6.5 ca
75718	Dichlorodifluoromethane	12 nc	1.9 (M) nc	340 nc
75343	1,1-Dichloroethane	0.66 (M) ca	0.35 (M) ca	16 ca
107062	1,2-Dichloroethane	7.5E-02 (M) ca	0.11 (M) ca	0.98 ca
75354	1,1-Dichloroethylene	7.0 nc	1.6 (M) nc	210 nc
156592	cis-1,2-Dichloroethylene	0.36 (M) nc	0.26 (M) nc	8.3 nc
156605	trans-1,2-Dichloroethylene	3.0 nc	1.5 (M) nc	83 nc
78875	1,2-Dichloropropane	0.22 (M) nc	0.32 (M) nc	4.2 nc
542756	1,3-Dichloropropene	0.31 (M) (J) ca	0.45 (M) (J) ca	6.4 (J) ca
60297	Diethyl ether	75 nc	46 (M) nc	1,000 nc
108203	Diisopropyl ether	36 (DD) dev	34 (M) (DD) dev	700 (DD) dev

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **restricted** site-specific criteria that apply to a residential house with a **crawlspace with a dirt floor**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
123911	1,4-Dioxane	59 ca	46 (M) ca	5.1 ca
64175	Ethanol	1.0E+05 (FF) st	1.2E+05 (EE) st	19,000 (EE) st
141786	Ethyl acetate	31 nc	28 nc	73 nc
637923	Ethyl-tert-butyl ether (ETBE)	22 nc	DATA	390 nc
100414	Ethylbenzene	0.47 (M) ca	2.0 (M) ca	10 ca
106934	Ethylene dibromide	5.5E-03 (M) ca	2.1E-02 (M) ca	4.2E-02 ca
86737	Fluorene	160 nc	87,000 nc	150 nc
142825	n-Heptane	150 nc	23 nc	3,700 nc
87683	Hexachlorobutadiene (C-46)	5.9E-02 ca	1.3 (M) ca	1.2 ca
110543	n-Hexane	28 nc	3.9 nc	730 nc
591786	2-Hexanone	22 (M) nc	35 (M) nc	31 nc
67630	Isopropyl alcohol	1,700 nc	1,100 (M) nc	210 nc
98828	Isopropyl benzene	0.11 (M) ca	0.73 (M) ca	2.4 ca
108101	4-Methyl-2-pentanone (MIBK)	720 (DD) dev	2,000 (M) (DD) dev	3,000 (DD) dev
1634044	Methyl-tert-butyl ether (MTBE)	12 ca	11 (M) ca	98 ca
96377	Methylcyclopentane	27 (M) nc	4.1 (M) nc	730 nc
91576	2-Methylnaphthalene	2.5 (M) nc	390 nc	10 nc
91203	Naphthalene	0.16 (M) ca	13 (M) ca	0.75 ca
109660	Pentane	39 (M) nc	4.9 (M) nc	1,000 nc
85018	Phenanthrene	7.7E-02 (M) nc	DATA	0.10 nc
1336363	Polychlorinated biphenyls (PCBs)	3.1E-02 (M) (J) ca	DATA	0.25 (J) ca
103651	n-Propylbenzene	43 (DD) dev	340 (DD) dev	1,000 (DD) dev
129000	Pyrene	140 (S) sol	1.3E+07 nc	100 nc
100425	Styrene	2.7 ca	24 (M) ca	45 ca
630206	1,1,1,2-Tetrachloroethane	0.22 (M) ca	0.81 (M) ca	3.4 ca
79345	1,1,2,2-Tetrachloroethane	9.2E-02 (M) ca	0.67 (M) ca	0.44 ca

Table 1. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **restricted** site-specific criteria that apply to a residential house with a **crawlspace with a dirt floor**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
127184	Tetrachloroethylene	1.5 (FF) st	1.5 (M) (EE) st	41 (EE) st
109999	Tetrahydrofuran	1,500 nc	1,500 nc	2,100 nc
108883	Toluene	300 (FF) st	540 nc	5,200 nc
87616	1,2,3-Trichlorobenzene	2.9 (M) nc	270 nc	28 nc
120821	1,2,4-Trichlorobenzene	0.20 (M) nc	17 (M) nc	2.1 nc
71556	1,1,1-Trichloroethane	180 (FF) st	79 (EE) st	5,000 (EE) st
79005	1,1,2-Trichloroethane	2.2E-02 (M) nc	6.4E-02 (M) nc	0.21 nc
79016	Trichloroethylene	7.3E-02 (M) (DD) dev	5.5E-02 (M) (DD) dev	2.0 (DD) dev
75694	Trichlorofluoromethane	16 nc	3.4 (M) nc	460 nc
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	750 nc	290 nc	20,000 nc
540841	2,2,4-Trimethyl pentane	160 nc	26 (M) nc	3,700 nc
526738	1,2,3-Trimethylbenzene	3.7 (M) (JT) nc	52 (M) (JT) nc	63 (JT) nc
95636	1,2,4-Trimethylbenzene	3.2 (JT) nc	28 (M) (JT) nc	63 (JT) nc
108678	1,3,5-Trimethylbenzene	3.0 (JT) nc	20 (M) (JT) nc	63 (JT) nc
75014	Vinyl chloride	5.1E-02 (MM) (M) mut	8.4E-03 (MM) (M) mut	1.6 (MM) mut
1330207	Xylenes	11 (J) nc	47 (M) (J) nc	230 (J) nc
76142	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NR	NR	NR
622968	4-Ethyltoluene	NR	NR	NR
115071	Propylene	NR	NR	NR

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **slab-on-grade**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
83329	Acenaphthene	3,900 (S) sol	2.1E+05 nc	7,300 nc
208968	Acenaphthylene	65 nc	DATA	7,300 nc
994058	t-Amyl methyl ether (TAME)	3.9 (M) nc	DATA	2,200 nc
120127	Anthracene	43 (S) sol	1.3E+07 nc	35,000 nc
71432	Benzene	1.0 ca	1.7 (M) ca	110 ca
56553	Benzo(a)anthracene	9.4 (S) (MM) sol	1.6E+05 (MM) mut	5.8 (MM) mut
78933	2-Butanone (MEK)	2,600 (DD) dev	31,000 (DD) dev	1.7E+05 (DD) dev
75650	t-Butyl alcohol	230 nc	DATA	2,500 nc
104518	n-Butylbenzene	44 nc	560 nc	7,000 nc
135988	sec-Butylbenzene	270 nc	3,800 nc	14 nc
98066	t-Butylbenzene	7.7E-02 (M) nc	0.64 (M) nc	14 nc
110827	Cyclohexane	290 nc	320 (M) nc	2.1E+05 nc
124481	Dibromochloromethane	0.78 (MM) (M) mut	0.40 (MM) (M) mut	14 (MM) mut
95501	1,2-Dichlorobenzene	370 nc	1,500 nc	10,000 nc
541731	1,3-Dichlorobenzene	2.6 nc	10 (M) nc	100 nc
106467	1,4-Dichlorobenzene	5.9 ca	23 (M) ca	220 ca
75718	Dichlorodifluoromethane	13 nc	12 (M) nc	11,000 nc
75343	1,1-Dichloroethane	4.7 ca	2.6 (M) ca	530 ca
107062	1,2-Dichloroethane	1.4 ca	0.82 (M) ca	33 ca
75354	1,1-Dichloroethylene	18 nc	12 (M) nc	7,000 nc
156592	cis-1,2-Dichloroethylene	3.4 nc	2.1 (M) nc	280 nc
156605	trans-1,2-Dichloroethylene	16 nc	12 (M) nc	2,800 nc
78875	1,2-Dichloropropane	2.6 nc	2.1 (M) nc	140 nc
542756	1,3-Dichloropropene	3.3 (J) ca	3.1 (M) (J) ca	210 (J) ca
60297	Diethyl ether	1,200 nc	350 nc	35,000 nc
108203	Diisopropyl ether	36 (DD) dev	200 (M) (DD) dev	23,000 (DD) dev

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **slab-on-grade**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
123911	1,4-Dioxane	1,900 ca	370 (M) ca	170 ca
64175	Ethanol	1.0E+05 (FF) st	1.3E+06 (EE) st	6.3E+05 (EE) st
141786	Ethyl acetate	910 nc	210 nc	2,400 nc
637923	Ethyl-tert-butyl ether (ETBE)	22 nc	DATA	13,000 nc
100414	Ethylbenzene	2.8 ca	12 (M) ca	340 ca
106934	Ethylene dibromide	0.13 ca	7.4E-02 (M) ca	1.4 ca
86737	Fluorene	1,700 (S) sol	4.7E+05 nc	4,900 nc
142825	n-Heptane	150 nc	130 nc	1.2E+05 nc
87683	Hexachlorobutadiene (C-46)	0.32 ca	2.5 (M) ca	39 ca
110543	n-Hexane	29 nc	25 nc	24,000 nc
591786	2-Hexanone	660 nc	220 (M) nc	1,000 nc
67630	Isopropyl alcohol	53,000 nc	9,900 nc	7,000 nc
98828	Isopropyl benzene	0.60 (M) ca	3.8 (M) ca	81 ca
108101	4-Methyl-2-pentanone (MIBK)	720 (DD) dev	12,000 (DD) dev	1.0E+05 (DD) dev
1634044	Methyl-tert-butyl ether (MTBE)	250 ca	74 (M) ca	3,300 ca
96377	Methylcyclopentane	30 (M) nc	29 (M) nc	24,000 nc
91576	2-Methylnaphthalene	66 nc	1,700 nc	350 nc
91203	Naphthalene	4.2 (M) ca	67 (M) ca	25 ca
109660	Pentane	40 (M) nc	36 (M) nc	35,000 nc
85018	Phenanthrene	7.7E-02 (M) nc	DATA	3.5 nc
1336363	Polychlorinated biphenyls (PCBs)	3.1E-02 (M) (J) ca	DATA	8.5 (J) ca
103651	n-Propylbenzene	43 (DD) dev	1,800 (DD) dev	33,000 (DD) dev
129000	Pyrene	140 (S) sol	2.5E+07 nc	3,500 nc
100425	Styrene	33 ca	150 ca	1,500 ca
630206	1,1,1,2-Tetrachloroethane	3.1 ca	3.2 (M) ca	110 ca
79345	1,1,2,2-Tetrachloroethane	2.4 ca	2.7 (M) ca	15 ca

Table 2. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **slab-on-grade**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
127184	Tetrachloroethylene	1.5 (FF) st	6.2 (M) (EE) st	1,400 (EE) st
109999	Tetrahydrofuran	45,000 nc	13,000 nc	70,000 nc
108883	Toluene	300 (FF) st	3,700 nc	1.7E+05 nc
87616	1,2,3-Trichlorobenzene	58 nc	840 nc	940 nc
120821	1,2,4-Trichlorobenzene	3.8 (M) nc	53 (M) nc	70 nc
71556	1,1,1-Trichloroethane	180 (FF) st	450 (EE) st	1.7E+05 (EE) st
79005	1,1,2-Trichloroethane	0.47 (M) nc	0.37 (M) nc	7.0 nc
79016	Trichloroethylene	7.3E-02 (M) (DD) dev	0.33 (M) (DD) dev	67 (DD) dev
75694	Trichlorofluoromethane	22 nc	19 (M) nc	15,000 nc
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	840 nc	860 nc	6.6E+05 nc
540841	2,2,4-Trimethyl pentane	160 nc	130 (M) nc	1.2E+05 nc
526738	1,2,3-Trimethylbenzene	43 (JT) nc	270 (JT) nc	2,100 (JT) nc
95636	1,2,4-Trimethylbenzene	25 (JT) nc	150 (JT) nc	2,100 (JT) nc
108678	1,3,5-Trimethylbenzene	18 (JT) nc	100 (JT) nc	2,100 (JT) nc
75014	Vinyl chloride	0.12 (MM) (M) mut	8.2E-02 (MM) (M) mut	54 (MM) mut
1330207	Xylenes	75 (J) nc	280 (J) nc	7,600 (J) nc
76142	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NR	NR	NR
622968	4-Ethyltoluene	NR	NR	NR
115071	Propylene	NR	NR	NR

Table 3. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
83329	Acenaphthene	3,900 (S) sol	2.0E+05 nc	7,300 nc
208968	Acenaphthylene	65 nc	DATA	7,300 nc
994058	t-Amyl methyl ether (TAME)	3.9 (M) nc	DATA	2,200 nc
120127	Anthracene	43 (S) sol	1.3E+07 nc	35,000 nc
71432	Benzene	1.0 ca	1.7 (M) ca	110 ca
56553	Benzo(a)anthracene	9.4 (S) (MM) sol	1.6E+05 (MM) mut	5.8 (MM) mut
78933	2-Butanone (MEK)	2,600 (DD) dev	31,000 (DD) dev	1.7E+05 (DD) dev
75650	t-Butyl alcohol	230 nc	DATA	2,500 nc
104518	n-Butylbenzene	44 nc	550 nc	7,000 nc
135988	sec-Butylbenzene	270 nc	3,800 nc	14 nc
98066	t-Butylbenzene	7.7E-02 (M) nc	0.64 (M) nc	14 nc
110827	Cyclohexane	290 nc	320 (M) nc	2.1E+05 nc
124481	Dibromochloromethane	0.78 (MM) (M) mut	0.40 (MM) (M) mut	14 (MM) mut
95501	1,2-Dichlorobenzene	370 nc	1,500 nc	10,000 nc
541731	1,3-Dichlorobenzene	2.6 nc	10 (M) nc	100 nc
106467	1,4-Dichlorobenzene	5.9 ca	23 (M) ca	220 ca
75718	Dichlorodifluoromethane	13 nc	12 (M) nc	11,000 nc
75343	1,1-Dichloroethane	4.7 ca	2.6 (M) ca	530 ca
107062	1,2-Dichloroethane	1.4 ca	0.82 (M) ca	33 ca
75354	1,1-Dichloroethylene	18 nc	12 (M) nc	7,000 nc
156592	cis-1,2-Dichloroethylene	3.4 nc	2.1 (M) nc	280 nc
156605	trans-1,2-Dichloroethylene	16 nc	12 (M) nc	2,800 nc
78875	1,2-Dichloropropane	2.6 nc	2.1 (M) nc	140 nc
542756	1,3-Dichloropropene	3.3 (J) ca	3.1 (M) (J) ca	210 (J) ca
60297	Diethyl ether	1,200 nc	350 nc	35,000 nc
108203	Diisopropyl ether	36 (DD) dev	190 (M) (DD) dev	23,000 (DD) dev

Table 3. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
123911	1,4-Dioxane	1,900 ca	360 (M) ca	170 ca
64175	Ethanol	1.0E+05 (FF) st	1.3E+06 (EE) st	6.3E+05 (EE) st
141786	Ethyl acetate	910 nc	210 nc	2,400 nc
637923	Ethyl-tert-butyl ether (ETBE)	22 nc	DATA	13,000 nc
100414	Ethylbenzene	2.8 ca	12 (M) ca	340 ca
106934	Ethylene dibromide	0.13 ca	7.4E-02 (M) ca	1.4 ca
86737	Fluorene	1,700 (S) sol	4.7E+05 nc	4,900 nc
142825	n-Heptane	150 nc	130 nc	1.2E+05 nc
87683	Hexachlorobutadiene (C-46)	0.32 ca	2.5 (M) ca	39 ca
110543	n-Hexane	29 nc	25 nc	24,000 nc
591786	2-Hexanone	660 nc	210 (M) nc	1,000 nc
67630	Isopropyl alcohol	53,000 nc	9,800 nc	7,000 nc
98828	Isopropyl benzene	0.60 (M) ca	3.8 (M) ca	81 ca
108101	4-Methyl-2-pentanone (MIBK)	720 (DD) dev	12,000 (DD) dev	1.0E+05 (DD) dev
1634044	Methyl-tert-butyl ether (MTBE)	250 ca	74 (M) ca	3,300 ca
96377	Methylcyclopentane	30 (M) nc	29 (M) nc	24,000 nc
91576	2-Methylnaphthalene	66 nc	1,700 nc	350 nc
91203	Naphthalene	4.2 (M) ca	67 (M) ca	25 ca
109660	Pentane	40 (M) nc	36 (M) nc	35,000 nc
85018	Phenanthrene	7.7E-02 (M) nc	DATA	3.5 nc
1336363	Polychlorinated biphenyls (PCBs)	3.1E-02 (M) (J) ca	DATA	8.5 (J) ca
103651	n-Propylbenzene	43 (DD) dev	1,800 (DD) dev	33,000 (DD) dev
129000	Pyrene	140 (S) sol	2.5E+07 nc	3,500 nc
100425	Styrene	33 ca	150 ca	1,500 ca
630206	1,1,1,2-Tetrachloroethane	3.1 ca	3.2 (M) ca	110 ca
79345	1,1,2,2-Tetrachloroethane	2.4 ca	2.7 (M) ca	15 ca

Table 3. Residential Volatilization to Indoor Air Criteria (VIAC). The following are **unrestricted** site-specific criteria that apply to a residential house with a **basement**, the depth to groundwater submitted for this site (i.e. 3 ft), and USDA soil type of **sand**.

CAS#	Hazardous Substance	Groundwater In Contact (GWIC) (µg/L)	Soil (µg/kg)	Soil Gas** (µg/m ³)
127184	Tetrachloroethylene	1.5 (FF) st	6.2 (M) (EE) st	1,400 (EE) st
109999	Tetrahydrofuran	45,000 nc	13,000 nc	70,000 nc
108883	Toluene	300 (FF) st	3,700 nc	1.7E+05 nc
87616	1,2,3-Trichlorobenzene	58 nc	830 nc	940 nc
120821	1,2,4-Trichlorobenzene	3.8 (M) nc	53 (M) nc	70 nc
71556	1,1,1-Trichloroethane	180 (FF) st	450 (EE) st	1.7E+05 (EE) st
79005	1,1,2-Trichloroethane	0.47 (M) nc	0.37 (M) nc	7.0 nc
79016	Trichloroethylene	7.3E-02 (M) (DD) dev	0.33 (M) (DD) dev	67 (DD) dev
75694	Trichlorofluoromethane	22 nc	19 (M) nc	15,000 nc
76131	1,1,2-Trichloro-1,2,2-trifluoroethane	840 nc	860 nc	6.6E+05 nc
540841	2,2,4-Trimethyl pentane	160 nc	130 (M) nc	1.2E+05 nc
526738	1,2,3-Trimethylbenzene	43 (JT) nc	270 (JT) nc	2,100 (JT) nc
95636	1,2,4-Trimethylbenzene	25 (JT) nc	150 (JT) nc	2,100 (JT) nc
108678	1,3,5-Trimethylbenzene	18 (JT) nc	100 (JT) nc	2,100 (JT) nc
75014	Vinyl chloride	0.12 (MM) (M) mut	8.2E-02 (MM) (M) mut	54 (MM) mut
1330207	Xylenes	75 (J) nc	280 (J) nc	7,600 (J) nc
76142	1,2-Dichloro-1,1,2,2-tetrafluoroethane (Freon 114)	NR	NR	NR
622968	4-Ethyltoluene	NR	NR	NR
115071	Propylene	NR	NR	NR

FOOTNOTES

**Soil gas site-specific volatilization to indoor air (SSVIAC) are applicable for all depths.

- Acceptable Air Values (AAV) endpoint basis used for SSVIAC: (**ca**) = Carcinogenic; (**nc**) = Non-Carcinogenic; (**dev**) = Developmental; (**mut**) = Mutagenic cancer; (**st**) = Short-term (i.e., less than chronic exposure).
- Footnote **AA**: Health-based groundwater SSVIAC are not available due to insufficient toxicological data. Dissolved-phase methane in groundwater is not explosive; however, if liberated and allowed to accumulate in an enclosed structure the principle health and safety concerns are explosive, flammable, and asphyxiant properties of gas phase methane. The acceptable groundwater concentration is the flammability and explosivity screening level (**FESL**) is 10,000 µg/L.
- Footnote **C**: The health-based SSVIAC exceeds the chemical-specific soil saturation screening level (**Csat**). The person proposing or implementing response activity must document whether additional response activity is required to control non aqueous phase liquid (**NAPL**) to protect against risks associated with NAPL by using methods appropriate for the NAPL present.
- Footnote **CC**: Insufficient chemical-physical input parameters have been identified to allow the development of a health-based SSVIAC using standard equations. The health-based SSVIAC for groundwater is developed based solely on the approach that the department uses for shallow groundwater. If groundwater detections are present, soil vapor may be the most appropriate media to evaluate risk posed from the VIAP.
- Footnote **DATA**: Insufficient physical chemical parameters to calculate a health-based SSVIAC for specified media. If detections are present in specified media, health-based soil vapor SSVIAC should be used to evaluate risk.
- Footnote **DD**: Hazardous substance causes developmental effects. Residential SSVIAC are protective of both prenatal exposure using a pregnant female receptor and postnatal exposure using a child receptor. Nonresidential SSVIAC are protective of prenatal exposure using a pregnant female receptor. Prenatal developmental effects may occur after an acute (i.e. short-term) or full-term exposure.
- Footnote **EE**: The acceptable air concentration (**AAC**) for the volatile hazardous substances is not derived using standard equations. The hazardous substance may cause adverse human health effects for less than chronic exposures (i.e. short-term or acute). The AAC for these hazardous substances is the acute or intermediate minimum risk level (MRL) developed by the Agency for Toxic Substances and Disease Registry (ATSDR), a United States Environmental Protection Agency Integrated Risk Information System (IRIS) acute reference concentration, or an acute initial threshold screening level (ITSL) by the EGLE's Air Quality Division.
- Footnote **FF**: The AAC for the volatile hazardous substances are based on toxicity values that have been identified to have the potential to cause adverse human health effects for less than chronic exposures (i.e. short-term or acute). The short-term exposure for shallow groundwater health-based SSVIAC are based on modification of the standard equations by the department to develop applicable shallow groundwater values.
- Footnote **GG**: Health-based SSVIAC for soil vapor are not available due to insufficient toxicological data. The soil vapor value addresses the health and safety concerns of explosive, flammable, and asphyxiant properties of gas phase methane. The acceptable soil vapor concentration is derived based on 25% of the lower explosive level (**LEL**) for methane.
- Footnote **GW**: The calculated health-based SSVIAC for a hazardous substance based upon shallow groundwater is considered protective when it is greater than the calculated value for groundwater.
- Footnote **ID**: Requires further evaluation to determine the appropriate media to sample.
- Footnote **J**: Hazardous substance may be present in several isomer forms. Isomer-specific concentrations must be added together for comparison to criteria.
- Footnote **JT**: Hazardous substance may be present in several isomer forms. The health-based SSVIAC may be used for the individual isomer provided that it is the sole isomer detected; however, when multiple isomers are detected in a medium, the isomer-specific concentrations must be added together and compared to the most restrictive health-based SSVIAC of the detected isomers.
- Footnote **M**: The health-based SSVIAC may be below target detection limits (**TDL**). In accordance with Sec. 20120a(10) when the TDL for a hazardous substance is greater than the developed health-based SSVIAC, the TDL is used to evaluate the risk posed from the pathway.
- Footnote **MM**: Hazardous substance is a carcinogen with a mutagenic mode of action. The cancer potency values used in calculating health-based SSVIAC are modified using age-dependent adjustment factors for those carcinogenic chemicals identified as mutagenic.
- Footnote **NA**: The hazardous substance does not meet the department's definition of a volatile; therefore, no health-based SSVIAC were developed.
- Footnote **NR**: The hazardous substance has not been previously evaluated by the Remediation and Redevelopment Division Toxicology Unit. The identification, collection, and evaluation of toxicological literature and chemical-physical data cannot be completed within the timeframe requested.
- Footnote **S**: Calculated health-based SSVIAC exceeds the hazardous substance-specific water solubility limit; therefore, the water solubility limit is used to evaluate the risk posed from the pathway.
- Footnote **TX**: The Remediation and Redevelopment Division Toxicology Unit has not identified an inhalation toxicity value for the hazardous substance.