November 21, 2024

Mr. Brad Davison, Environmental Specialist
Land Quality Bureau
Iowa Department of Natural Resources
6200 Park Avenue, Suite 200
Des Moines, Iowa 50321

HLW Engineering Group
Engineering Management

RE: ANNUAL WATER QUALITY REPORT and GAS MONITORING REPORT
CEDAR COUNTY SANITARY LANDFILL
IDNR PERMIT NO. 16-SDP-01-76C

Dear Mr. Davison:

Permit provisions in Amendment #18, dated February 21, 2022 (Doc #102402) established an annual frequency for water quality monitoring and gas monitoring. Following submittal of the 2023 Annual Water Quality Report on November 30, 2023 (Doc #108349) the IDNR required that Statistically Significant Levels (SSL) and trends be evaluated (IDNR Letter dated January 23, 2024 – Doc #108891).

On May 6, 2024 an Evaluation of the SSL and trends was submitted to the IDNR (Doc #109996).

Based on the evaluation, IDNR again amended the Hydrologic Monitoring System Plan (HMSP) and the Gas Monitoring System Plan (GMSP) in a letter dated May 9, 2024 (Doc #110021). Water quality monitoring was reduced to a single well (MW-23), while the frequency of gas monitoring was increased from an annual frequency to a semi-annual frequency.

The results of the 2024 HMSP and GMSP are presented herein. This letter constitutes the 2024 Annual Water Quality Report and the 2024 Gas Monitoring Report.

Figure 1, Site Plan and Figure 2, 2024 Groundwater Contour Map are attached for reference.

Evaluation of Statistically Significant Levels (SSL) for VOC

The tables in Attachment A include the calculation of the Confidence Interval (95% Upper Confidence Limit to the 95% Lower Confidence Limit) for each compound at each well based on the past eight (8) sampling episodes. The Tables in Attachment A are updated to include the water quality results form MW-23 collected on May 29, 2024. The 95% Lower Confidence Limit (LCL) for each compound at each well is then directly compared to the Groundwater Protection Standard (GWPS) for each compound. The GWPS are equal to the Statewide Standards published in Iowa Administrative Code (IAC) 137.

Review of the tables indicates that the 95% LCL value (highlighted in orange) does not exceed the GWPS (highlighted in blue) for any compound at any well. It follows that there are no SSL recorded at the site based on evaluation of the data since April 9, 2019 (over the past five years).

The raw data is also reviewed. It is noted that vinyl chloride has exceeded the GWPS at MW-16, MW-17, and MW-23 during isolated sampling events which are typically interspersed with non-detected concentrations. Likewise, cis-1,2-dichloroethene also temporarily exceeded the GWPS at MW 23 in 2021 and 2022. There were no VOC detected in MW-23 that exceeded a GWPS in 2023 or 2024. The detection of elevated vinyl chloride and/or cis-1,2-dichloroethene is not consistently documented and is interpreted to be tied to landfill gas migration events.

The conclusion is made that plume delineation or further assessment of water quality is not required in the absence of an SSL. It is surmised that the concentrations have previously peaked and that both the concentrations and the fluctuations within the referenced wells will diminish with time given that the site has been closed since at least June 14, 1993 (the date of issuance of the Closure Permit).

Evaluation of Trends

Trend lines have been added on the graphs in Attachment A. The trend lines are only added to those wells where there are predominantly detected compounds.

The trend lines represent linear regression of the data and conform to the trend testing methods included in the Unified Guidance (Section 17.3.1). The linear regression equation (y=mx+b) dictates that the slope of the line would indicate upward or downward trends. It is acknowledged that there are non-detect values included in the trend lines (non-detect data is included as ½ the MDL). Review of the non-detect values does not indicate any changes in the MRL over time (has consistently been 1.0 ug/L) so there is no bias perceived in the non-detect data due to improved MRL over time.

Review of the plotted trend lines indicates downward trends in all data, with the following exceptions:

Vinyl chloride at MW-23
trans-1,2-dichloroethene at MW-23
cis-1,2-dichloroethene at MW-23

In each of the referenced instances at MW-23, a short-term spike in the concentrations in 2020 through 2022 seems to drive an apparent upward trend. It is also noted that the concentrations of vinyl chloride, trans-1,2-dichloroethene, and cis-1,2-dichloroethene were again undetected or dramatically decreased in the both the 2023 and 2024 test results. The recent results would suggest a downward trend line in vinyl chloride, trans-1,2-dichloroethene, and cis-1,2-dichloroethene since 2021/2022.

Evaluation of Gas Monitoring Data

The tables in Attachment B support the observation that the methane concentrations were reported at or above the 100% Lower Explosive Limit (LEL) at MW-16 on two (2) occasions (May 11, 2020 and April 22, 2021) and at MW-14 on one (1) occasion (September 20, 2020). All gas monitoring results collected after April 22, 2021 (through October 2024) have been reported to be below 100% LEL.

Further review indicates that when concentrations of gas are detected above the reporting limit (<1% LEL) they are reported at MW-23, MW-14, MW-16, MW-17, and MW-18.

The gas monitoring performed in 2020 and 2021 was by others. The gas monitoring in 2022, 2023, and 2024 was performed by HLW Engineering. It is presumed herein that the referenced methane detections in the past (2020 and 2021) did not require any additional steps (pursuant 113.9(2)"c"(1)) to protect human health based on the nearby land use, the site relief on adjacent lands, and land ownership. A detailed review of the operating record has not been performed to determine whether a notification pursuant 113.9(2)"c" was filed.

Concluding Observations

Water quality impact at the site is interpreted to include low-level VOC impact at numerous monitoring well locations across the site. The data presented herein does not indicate that VOC exceeds a Statistically Significant Level (SSL) at any well location. It follows that further water quality assessment, delineation, and/or corrective measures are not warranted at this site pursuant applicable rule.

The observed data does draw a direct correlation between apparent landfill gas impacts and VOC impacts in certain distinct locations at the site, namely in the northeast corner (near MW-14 and MW-23) and along the west side (near MW-16, MW-17, and MW-18). Gas impacts and VOC detections appear to occur in the same wells.

Recommendations

Landfill gas venting in or near the waste boundary in the northeast corner and along the west side of the site may reduce VOC concentrations at MW-23, MW-16, MW-17, and MW-18 and may preclude future elevated landfill gas readings at MW-23, MW-14, MW-16, MW-17, and MW-18.

Cedar County is currently working with a local excavator to determine whether the installation of gas venting (outside of the Waste Boundary) can be completed cost effectively in 2025, or whether additional time is required to budget for the gas venting project in upcoming years.

It is recommended that the Closure Permit expiration date again be modified (to June 14, 2027) in order to accommodate installation of gas venting prior to that date.

It is recommended that MW-23 be sampled for the Appendix I VOC semi-annually and that the gas monitoring also be performed semi-annually through April, 2027.

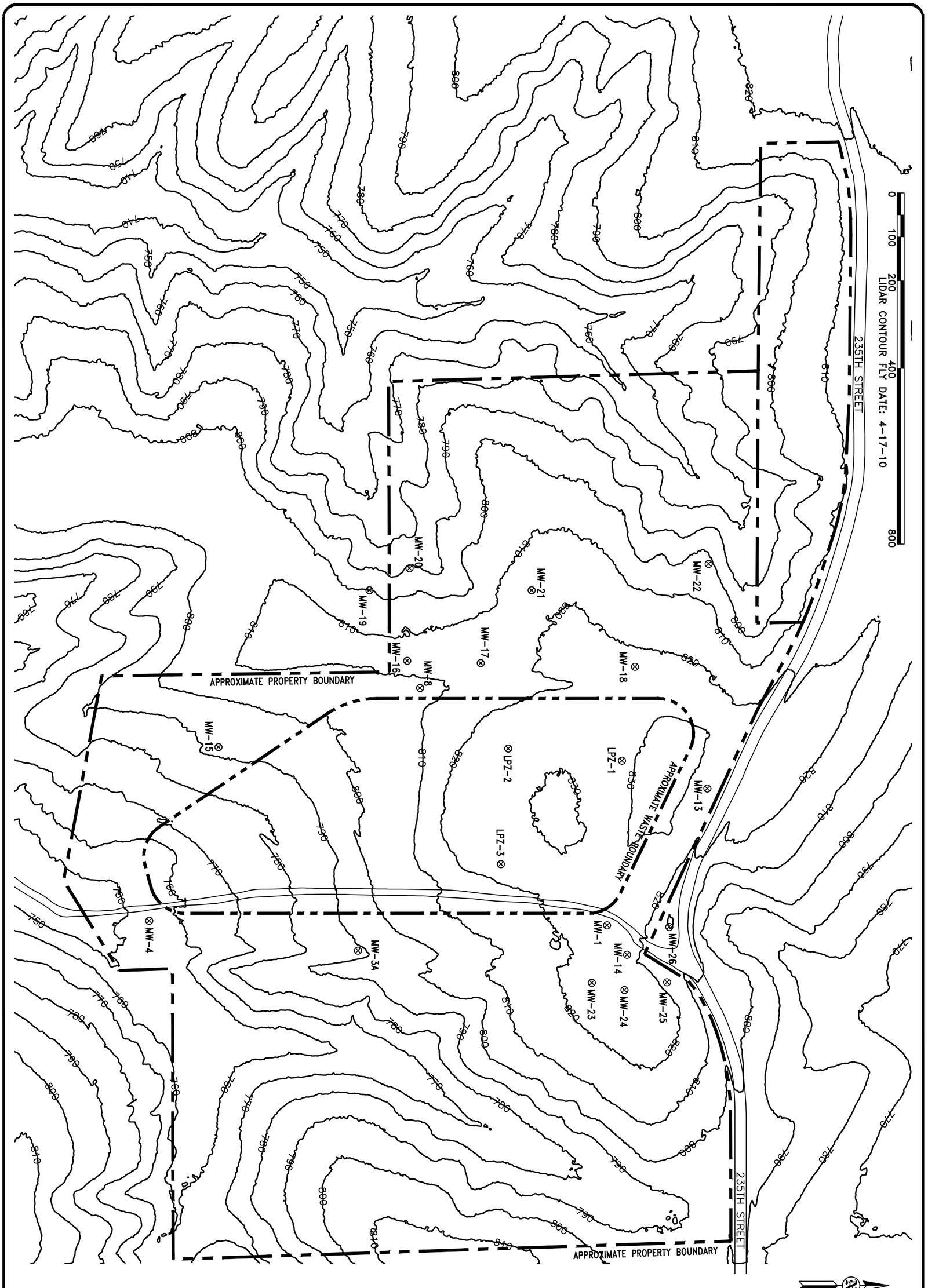
It is recommended that Cedar County request permission from IDNR to proceed with an Environmental Covenant for the site upon completion of the gas venting project.

Please let me know if you agree with the conclusions and recommendations included herein.

Respectfully,
HLW Engineering Group

Todd Whipple, CPG.
Project Manager

cc: Gary Crock, Director, Cedar County Solid Waste Commission (electronic copy)



HLW Engineering Group
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SITE PLAN

CEDAR COUNTY SANITARY LANDFILL
TIPTON, IOWA

FIGURE:	1	
REVISION	NO.	DATE
DRAWN DRA	PROJECT NO. 6053	DATE 10-30-24

0 100 200 400

LIDAR CONTOUR FLY DATE: 4-17-10

APPROXIMATE WASTE BOUNDARY

APPROXIMATE PROPERTY BOUNDARY

MW-26
MW-14
MW-23
MW-18
MW-17
MW-20
MW-16
MW-19
MW-3A
MW-15
MW-4

WATER ELEVATION OCTOBER 11, 2024	
WELL	ELEV.
MW-3A	774.08
MW-4	729.61
MW-14	798.50
MW-15	775.52
MW-16	788.44
MW-17	795.37
MW-18	798.43
MW-19	776.08
MW-20	773.72
MW-23	793.80
MW-26	799.22

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WATER TABLE CONTOURS

CEDAR COUNTY SANITARY LANDFILL
TIPTON, IOWA

FIGURE: 2

REVISION	NO.	DATE
DRAWN DRA	PROJECT NO. 6053	DATE 10-31-24

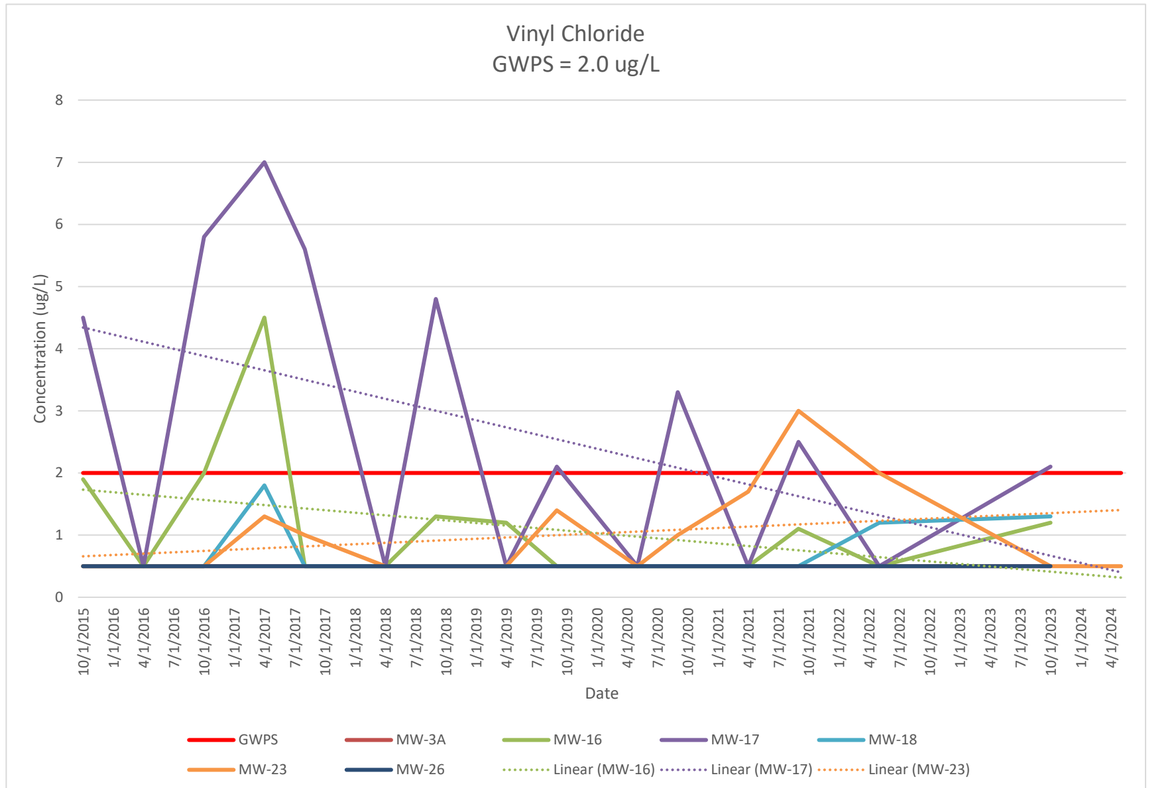
ATTACHMENT A

Tables & Graphs &
Analytical Reports

Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

0.5 = Red text represent undetected values that are reported at one-half of the MRL

Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	vinyl chloride	2	0.5	**1.9**	**4.5**	0.5	0.5	0.5
4/13/2016	vinyl chloride	2	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	vinyl chloride	2	0.5	**2**	**5.8**	0.5	0.5	0.5
4/3/2017	vinyl chloride	2	0.5	**4.5**	**7**	**1.8**	**1.3**	0.5
8/29/2017	vinyl chloride	2	0.5	0.5	**5.6**	0.5	**1**	0.5
4/17/2018	vinyl chloride	2	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	vinyl chloride	2	0.5	**1.3**	**4.8**	0.5	0.5	0.5
4/9/2019	vinyl chloride	2	0.5	**1.2**	0.5	0.5	0.5	0.5
9/4/2019	vinyl chloride	2	0.5	0.5	**2.1**	0.5	**1.4**	0.5
5/11/2020	vinyl chloride	2	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	vinyl chloride	2	0.5	0.5	**3.3**	0.5	**1**	0.5
4/22/2021	vinyl chloride	2	0.5	0.5	0.5	0.5	**1.7**	0.5
9/13/2021	vinyl chloride	2	0.5	**1.1**	**2.5**	0.5	**3**	0.5
5/18/2022	vinyl chloride	2	0.5	0.5	0.5	**1.2**	**2**	0.5
10/19/2023	vinyl chloride	2	0.5	**1.2**	**2.1**	**1.3**	0.5	0.5
5/29/2024	vinyl chloride	2					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.75	1.5	0.6875	1.233333	0.5
standard deviation			0	0.324037	1.058301	0.32572	0.827312	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0.114564	0.374166	0.11516	0.292499	0
Margin of Error			0	0.2171	0.709044	0.218227	0.554285	0
95% UCL (mean + Margin of Error)			**0.5**	**0.9671**	**2.209044**	**0.905727**	**1.787619**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5329**	**0.790956**	**0.469273**	**0.679048**	**0.5**
GWPS (ug/L)			**2.0**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
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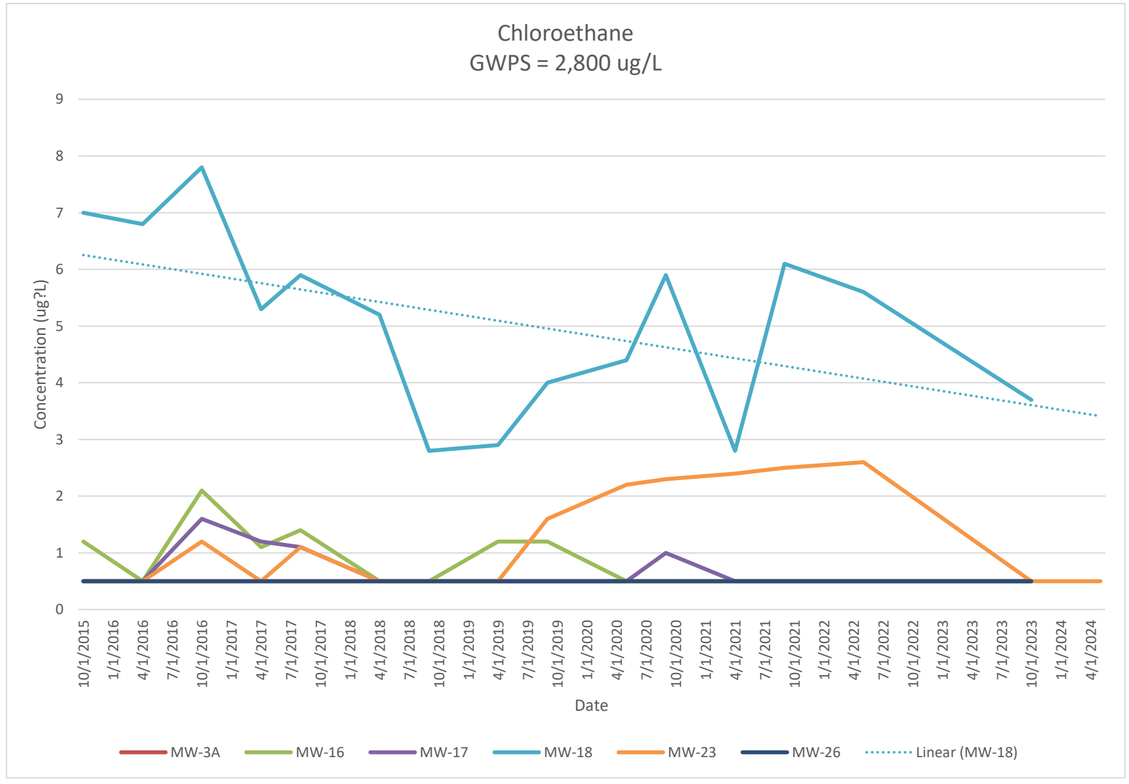
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	chloroethane	2800	0.5	**1.2**	0.5	**7**	0.5	0.5
4/13/2016	chloroethane	2800	0.5	0.5	0.5	**6.8**	0.5	0.5
10/4/2016	chloroethane	2800	0.5	**2.1**	**1.6**	**7.8**	**1.2**	0.5
4/3/2017	chloroethane	2800	0.5	**1.1**	**1.2**	**5.3**	0.5	0.5
8/29/2017	chloroethane	2800	0.5	**1.4**	**1.1**	**5.9**	**1.1**	0.5
4/17/2018	chloroethane	2800	0.5	0.5	0.5	**5.2**	0.5	0.5
9/17/2018	chloroethane	2800	0.5	0.5	0.5	**2.8**	0.5	0.5
4/9/2019	chloroethane	2800	0.5	**1.2**	0.5	**2.9**	0.5	0.5
9/4/2019	chloroethane	2800	0.5	**1.2**	0.5	**4**	**1.6**	0.5
5/11/2020	chloroethane	2800	0.5	0.5	0.5	**4.4**	**2.2**	0.5
9/21/2020	chloroethane	2800	0.5	0.5	**1**	**5.9**	**2.3**	0.5
4/22/2021	chloroethane	2800	0.5	0.5	0.5	**2.8**	**2.4**	0.5
9/13/2021	chloroethane	2800	0.5	0.5	0.5	**6.1**	**2.5**	0.5
5/18/2022	chloroethane	2800	0.5	0.5	0.5	**5.6**	**2.6**	0.5
10/19/2023	chloroethane	2800	0.5	0.5	0.5	**3.7**	0.5	0.5
5/29/2024	chloroethane	2800					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.675	0.5625	4.425	1.677778	0.5
standard deviation			0	0.303109	0.165359	1.22653	0.874043	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0.107165	0.058463	0.433644	0.309021	0
Margin of Error			0	0.203078	0.110788	0.821755	0.585594	0
95% UCL (mean + Margin of Error)			**0.5**	**0.878078**	**0.673288**	**5.246755**	**2.263372**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.471922**	**0.451712**	**3.603245**	**1.092183**	**0.5**
GWPS (ug/L)			**2800**	**2800**	**2800**	**2800**	**2800**	**2800**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



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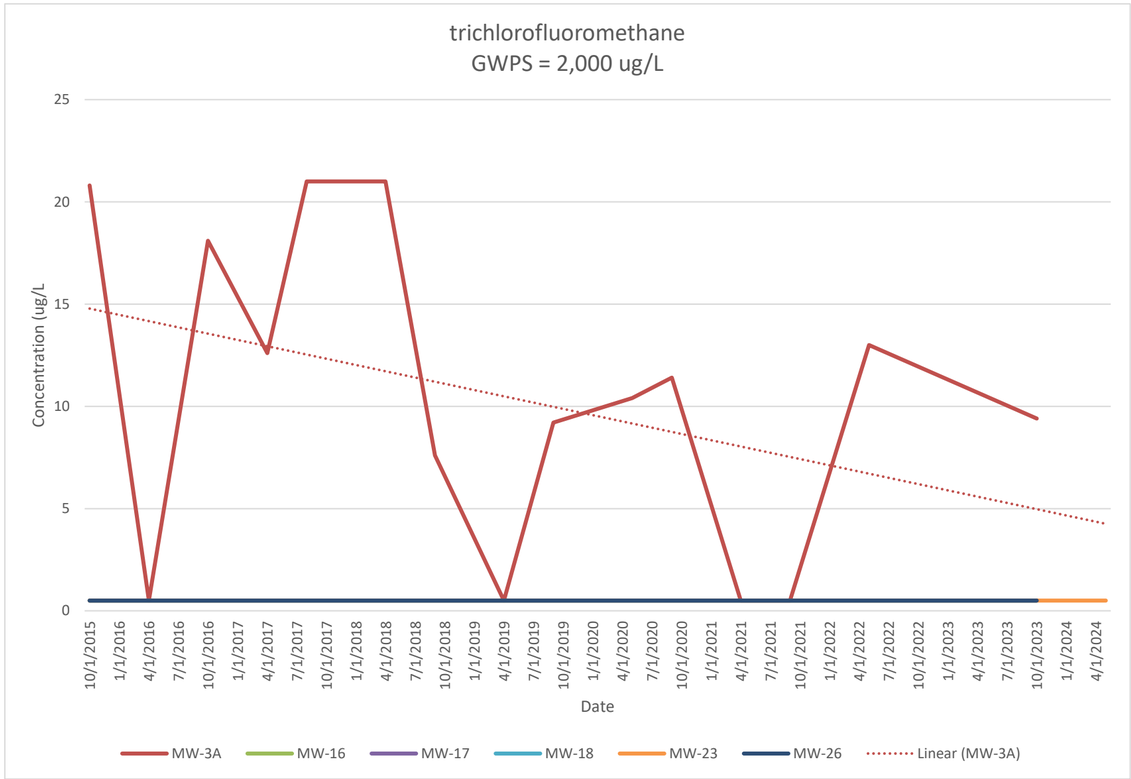
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	trichlorofluoromethane	2000	**20.8**	0.5	0.5	0.5	0.5	0.5
4/13/2016	trichlorofluoromethane	2000	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	trichlorofluoromethane	2000	**18.1**	0.5	0.5	0.5	0.5	0.5
4/3/2017	trichlorofluoromethane	2000	**12.6**	0.5	0.5	0.5	0.5	0.5
8/29/2017	trichlorofluoromethane	2000	**21**	0.5	0.5	0.5	0.5	0.5
4/17/2018	trichlorofluoromethane	2000	**21**	0.5	0.5	0.5	0.5	0.5
9/17/2018	trichlorofluoromethane	2000	**7.6**	0.5	0.5	0.5	0.5	0.5
4/9/2019	trichlorofluoromethane	2000	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	trichlorofluoromethane	2000	**9.2**	0.5	0.5	0.5	0.5	0.5
5/11/2020	trichlorofluoromethane	2000	**10.4**	0.5	0.5	0.5	0.5	0.5
9/21/2020	trichlorofluoromethane	2000	**11.4**	0.5	0.5	0.5	0.5	0.5
4/22/2021	trichlorofluoromethane	2000	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	trichlorofluoromethane	2000	0.5	0.5	0.5	0.5	0.5	0.5
5/18/2022	trichlorofluoromethane	2000	**13**	0.5	0.5	0.5	0.5	0.5
10/19/2023	trichlorofluoromethane	2000	**9.4**	0.5	0.5	0.5	0.5	0.5
5/29/2024	trichlorofluoromethane	2000					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			6.8625	0.5	0.5	0.5	0.5	0.5
standard deviation			5.051222	0	0	0	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			1.785877	0	0	0	0	0
Margin of Error			3.384236	0	0	0	0	0
95% UCL (mean + Margin of Error)			**10.24674**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**3.478264**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
GWPS (ug/L)			**2000**	**2000**	**2000**	**2000**	**2000**	**2000**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



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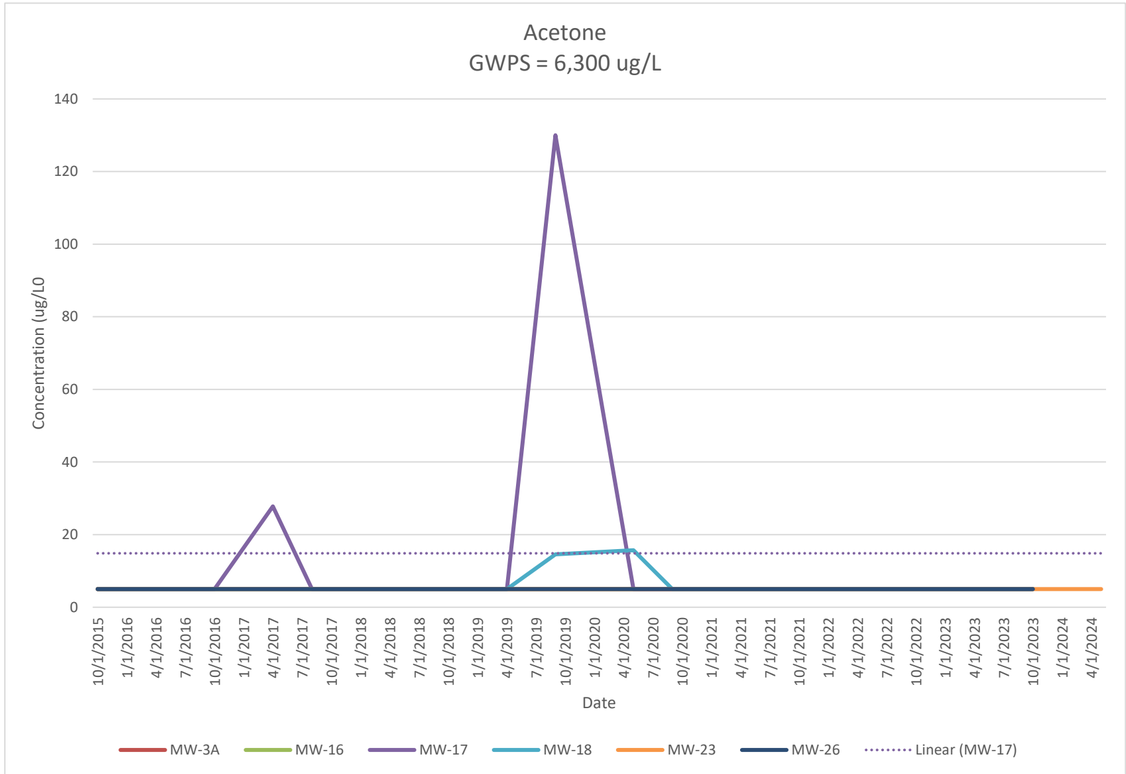
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	acetone	6300	5	5	5	5	5	5
4/13/2016	acetone	6300	5	5	5	5	5	5
10/4/2016	acetone	6300	5	5	5	5	5	5
4/3/2017	acetone	6300	5	5	**27.8**	5	5	5
8/29/2017	acetone	6300	5	5	5	5	5	5
4/17/2018	acetone	6300	5	5	5	5	5	5
9/17/2018	acetone	6300	5	5	5	5	5	5
4/9/2019	acetone	6300	5	5	5	5	5	5
9/4/2019	acetone	6300	5	5	**130**	**14.6**	5	5
5/11/2020	acetone	6300	5	5	5	**15.7**	5	5
9/21/2020	acetone	6300	5	5	5	5	5	5
4/22/2021	acetone	6300	5	5	5	5	5	5
9/13/2021	acetone	6300	5	5	5	5	5	5
5/18/2022	acetone	6300	5	5	5	5	5	5
10/19/2023	acetone	6300	5	5	5	5	5	5
5/29/2024	acetone	6300					5	
Sample size = 8			8	8	8	8	8	8
Mean value			5	5	20.625	7.5375	5	5
standard deviation			0	0	41.33986	4.403674	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	14.61585	1.556934	0	0
Margin of Error			0	0	27.69703	2.95039	0	0
95% UCL (mean + Margin of Error)			**5**	**5**	**48.32203**	**10.48789**	**5**	**5**
95% LCL (mean - Margin of Error)			**5**	**5**	**-7.07203**	**4.58711**	**5**	**5**
GWPS (ug/L)			**6300**	**6300**	**6300**	**6300**	**6300**	**6300**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
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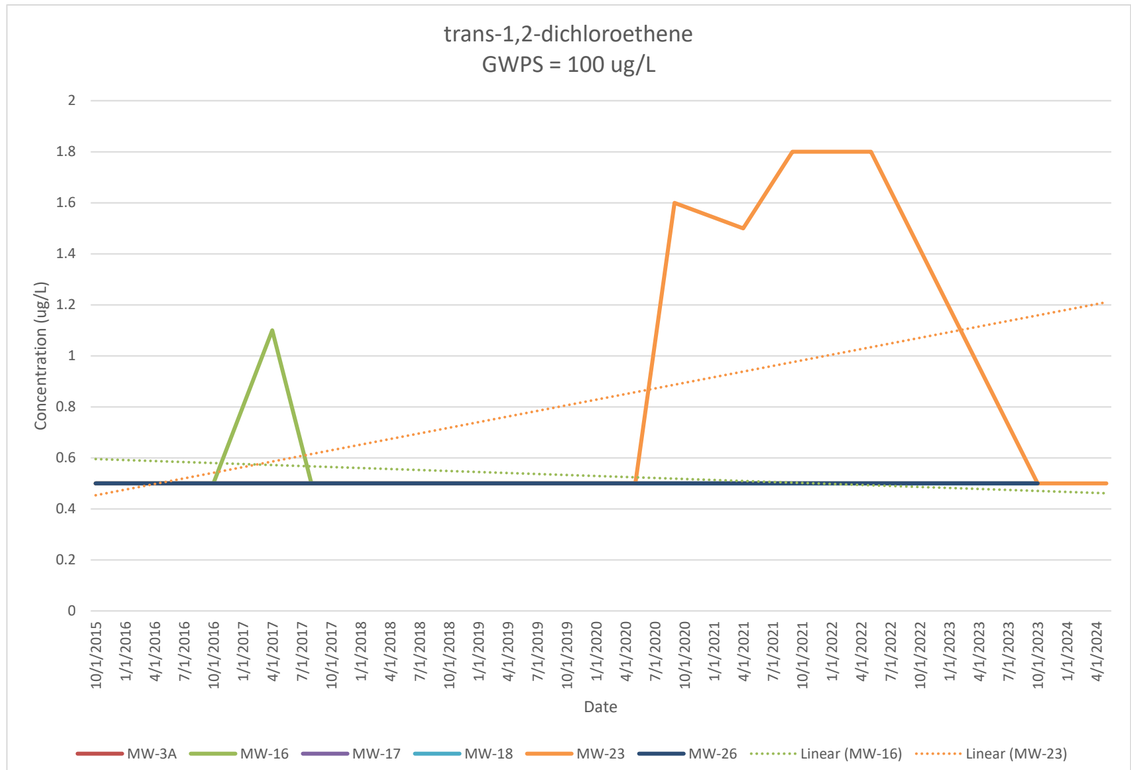
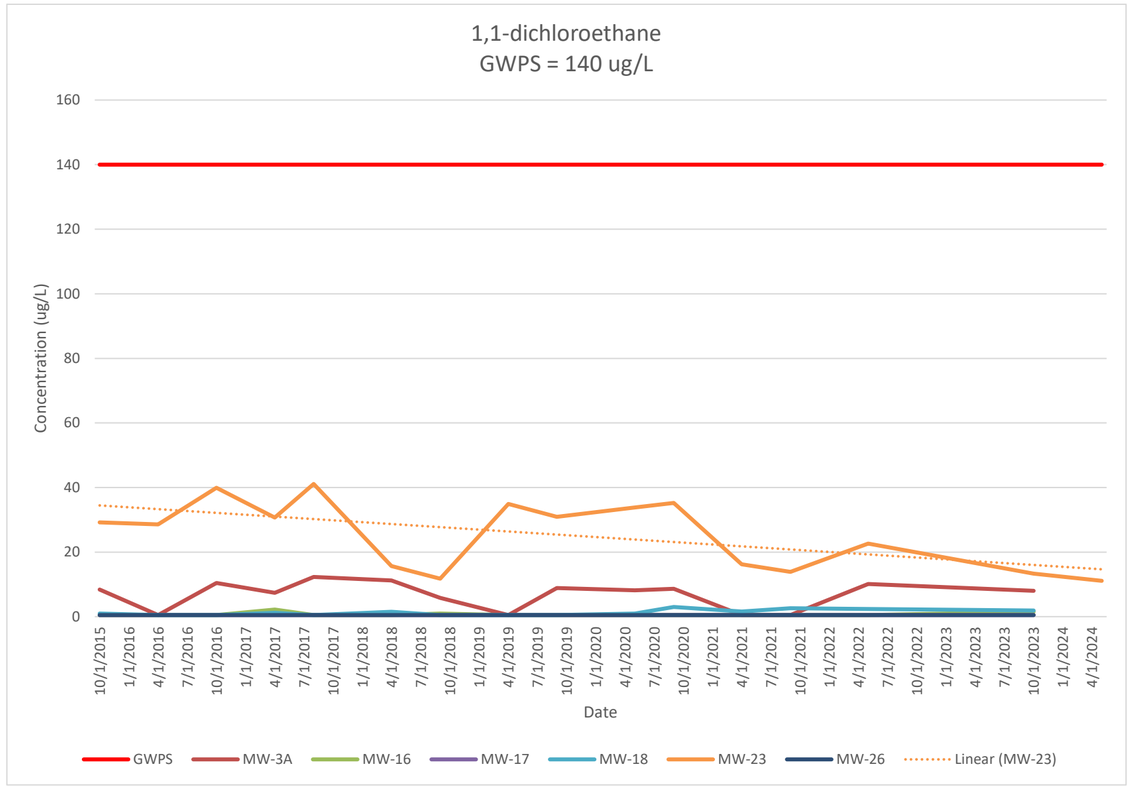
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
4/13/2016	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
4/3/2017	trans-1,2-dichloroethene	100	0.5	**1.1**	0.5	0.5	0.5	0.5
8/29/2017	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
4/17/2018	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
4/9/2019	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
5/11/2020	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	**1.6**	0.5
4/22/2021	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	**1.5**	0.5
9/13/2021	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	**1.8**	0.5
5/18/2022	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	**1.8**	0.5
10/19/2023	trans-1,2-dichloroethene	100	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	trans-1,2-dichloroethene	100					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.5	0.5	0.5	1.022222	0.5
standard deviation			0	0	0	0	0.59025	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	0	0	0.208685	0
Margin of Error			0	0	0	0	0.395458	0
95% UCL (mean + Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**1.41768**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**0.626764**	**0.5**
GWPS (ug/L)			**100**	**100**	**100**	**100**	**100**	**100**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

0.5 = Red text represent undetected values that are reported at one-half of the MRL

Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	1,1-dichloroethane	140	**8.4**	0.5	0.5	**1**	**29.2**	0.5
4/13/2016	1,1-dichloroethane	140	0.5	0.5	0.5	0.5	**28.6**	0.5
10/4/2016	1,1-dichloroethane	140	**10.4**	0.5	0.5	0.5	**39.9**	0.5
4/3/2017	1,1-dichloroethane	140	**7.4**	**2.2**	0.5	**1.2**	**30.7**	0.5
8/29/2017	1,1-dichloroethane	140	**12.3**	0.5	0.5	0.5	**41.1**	0.5
4/17/2018	1,1-dichloroethane	140	**11.2**	0.5	0.5	**1.5**	**15.7**	0.5
9/17/2018	1,1-dichloroethane	140	**5.8**	**1**	0.5	0.5	**11.8**	0.5
4/9/2019	1,1-dichloroethane	140	0.5	0.5	0.5	0.5	**34.9**	0.5
9/4/2019	1,1-dichloroethane	140	**8.9**	0.5	0.5	0.5	**30.9**	0.5
5/11/2020	1,1-dichloroethane	140	**8.2**	0.5	0.5	**1**	**33.8**	0.5
9/21/2020	1,1-dichloroethane	140	**8.6**	0.5	0.5	**3**	**35.2**	0.5
4/22/2021	1,1-dichloroethane	140	0.5	0.5	0.5	**1.6**	**16.2**	0.5
9/13/2021	1,1-dichloroethane	140	0.5	0.5	0.5	**2.6**	**13.9**	0.5
5/18/2022	1,1-dichloroethane	140	**10.1**	0.5	0.5	**2.4**	**22.6**	0.5
10/19/2023	1,1-dichloroethane	140	**8**	**1.5**	0.5	**1.9**	**13.3**	0.5
5/29/2024	1,1-dichloroethane	140					**11.1**	
Sample size = 8			8	8	8	8	8	8
Mean value			5.6625	0.625	0.5	1.6875	23.54444	0.5
standard deviation			4.041329	0.330719	0	0.895038	9.613314	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			1.428826	0.116927	0	0.316444	3.39882	0
Margin of Error			2.707625	0.221576	0	0.599661	6.440763	0
95% UCL (mean + Margin of Error)			**8.370125**	**0.846576**	**0.5**	**2.287161**	**29.98521**	**0.5**
95% LCL (mean - Margin of Error)			**2.954875**	**0.403424**	**0.5**	**1.087839**	**17.10368**	**0.5**
GWPS (ug/L)			**140**	**140**	**140**	**140**	**140**	**140**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

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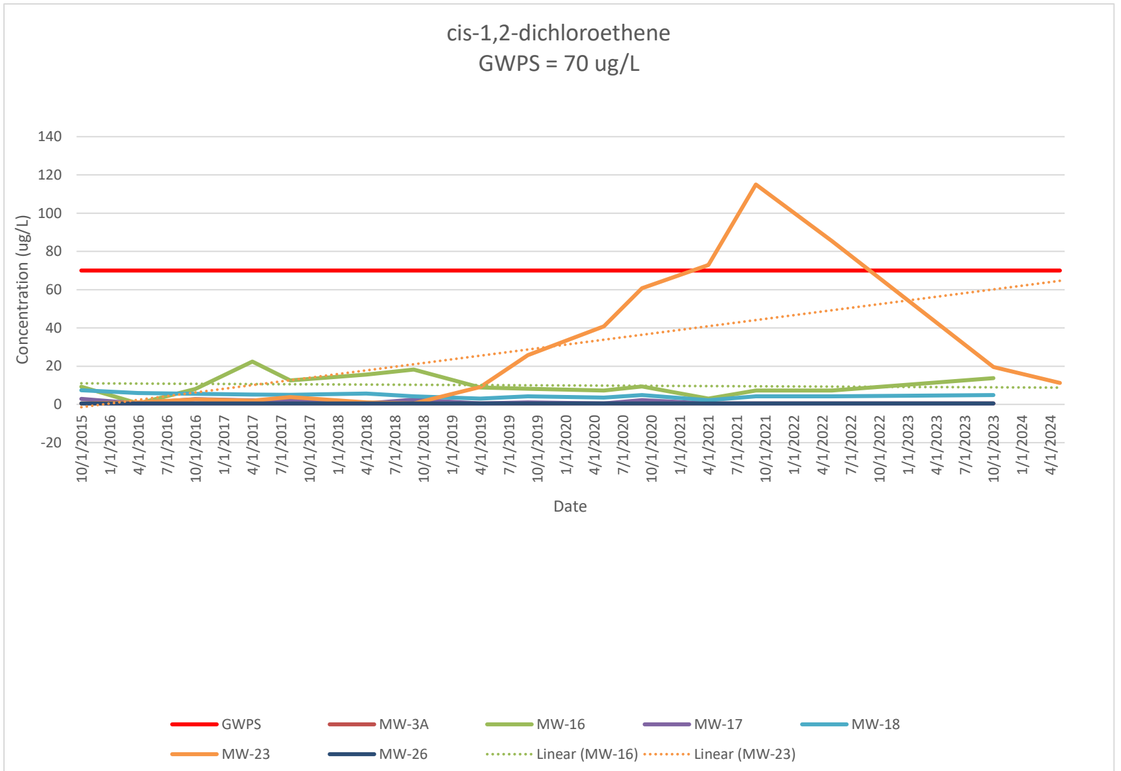
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	cis-1,2-dichloroethene	70	0.5	**9.2**	**2.9**	**7.4**	0.5	0.5
4/13/2016	cis-1,2-dichloroethene	70	0.5	0.5	0.5	**6**	**1**	0.5
10/4/2016	cis-1,2-dichloroethene	70	0.5	**8.1**	**2.8**	**5.5**	**2.7**	0.5
4/3/2017	cis-1,2-dichloroethene	70	0.5	**22.4**	**2.1**	**5.1**	**2**	0.5
8/29/2017	cis-1,2-dichloroethene	70	0.5	**12.5**	**2.5**	**5**	**3.8**	0.5
4/17/2018	cis-1,2-dichloroethene	70	0.5	**15.6**	0.5	**5.7**	**1.1**	0.5
9/17/2018	cis-1,2-dichloroethene	70	0.5	**18.2**	**2.5**	**4.2**	0.5	0.5
4/9/2019	cis-1,2-dichloroethene	70	0.5	**8.9**	0.5	**3.1**	**9.1**	0.5
9/4/2019	cis-1,2-dichloroethene	70	0.5	**8.2**	**1**	**4.2**	**25.7**	0.5
5/11/2020	cis-1,2-dichloroethene	70	0.5	**7.2**	0.5	**3.6**	**40.8**	0.5
9/21/2020	cis-1,2-dichloroethene	70	0.5	**9.4**	**2.2**	**4.9**	**60.8**	0.5
4/22/2021	cis-1,2-dichloroethene	70	0.5	**3**	0.5	**2.2**	**72.9**	0.5
9/13/2021	cis-1,2-dichloroethene	70	0.5	**7.3**	0.5	**4.2**	**115**	0.5
5/18/2022	cis-1,2-dichloroethene	70	0.5	**7.2**	0.5	**4.2**	**85.5**	0.5
10/19/2023	cis-1,2-dichloroethene	70	0.5	**13.7**	0.5	**4.9**	**19.6**	0.5
5/29/2024	cis-1,2-dichloroethene	70					**11.2**	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	8.1125	0.775	3.9125	48.95556	0.5
standard deviation			0	2.783181	0.562917	0.857959	34.79148	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0.984003	0.199021	0.303334	12.30064	0
Margin of Error			0	1.864686	0.377145	0.574819	23.30972	0
95% UCL (mean + Margin of Error)			**0.5**	**9.977186**	**1.152145**	**4.487319**	**72.26528**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**6.247814**	**0.397855**	**3.337681**	**25.64583**	**0.5**
GWPS (ug/L)			**70**	**70**	**70**	**70**	**70**	**70**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

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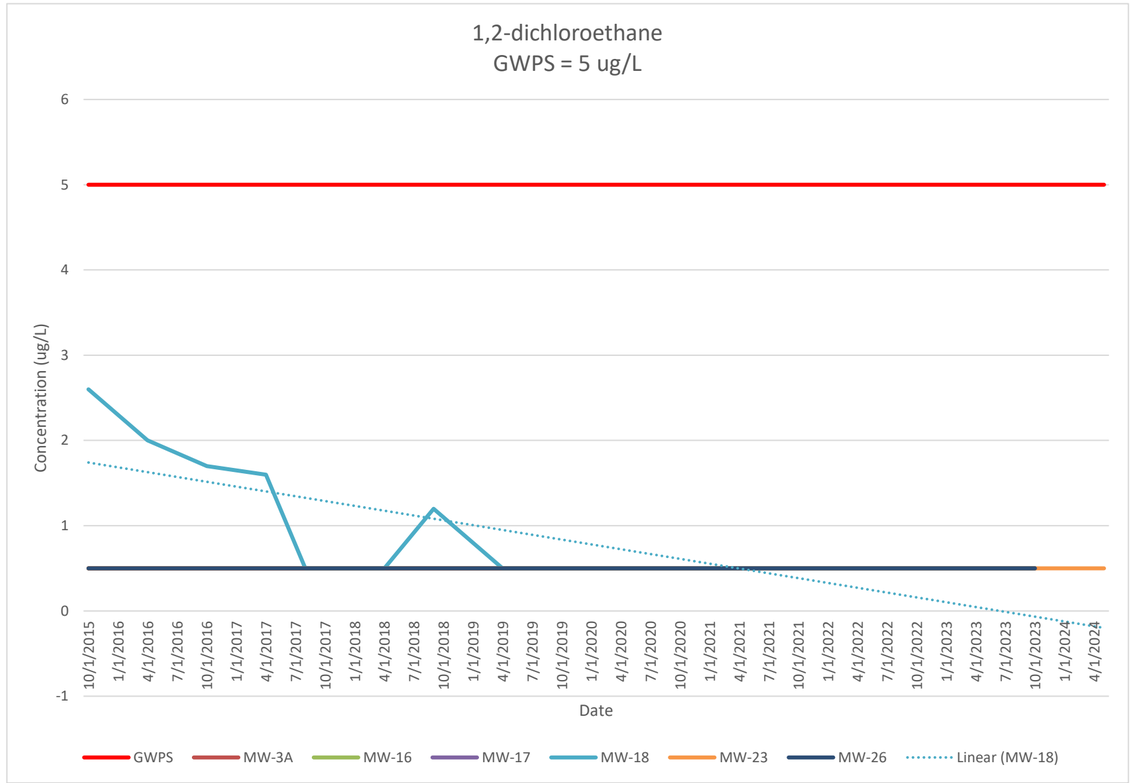
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	1,2-Dichloroethane	5	0.5	0.5	0.5	**2.6**	0.5	0.5
4/13/2016	1,2-Dichloroethane	5	0.5	0.5	0.5	**2**	0.5	0.5
10/4/2016	1,2-Dichloroethane	5	0.5	0.5	0.5	**1.7**	0.5	0.5
4/3/2017	1,2-Dichloroethane	5	0.5	0.5	0.5	**1.6**	0.5	0.5
8/29/2017	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
4/17/2018	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	1,2-Dichloroethane	5	0.5	0.5	0.5	**1.2**	0.5	0.5
4/9/2019	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
5/11/2020	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
4/22/2021	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
5/18/2022	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
10/19/2023	1,2-Dichloroethane	5	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	1,2-Dichloroethane	5					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.5	0.5	0.5	0.5	0.5
standard deviation			0	0	0	0	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	0	0	0	0
Margin of Error			0	0	0	0	0	0
95% UCL (mean + Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
GWPS (ug/L)			**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

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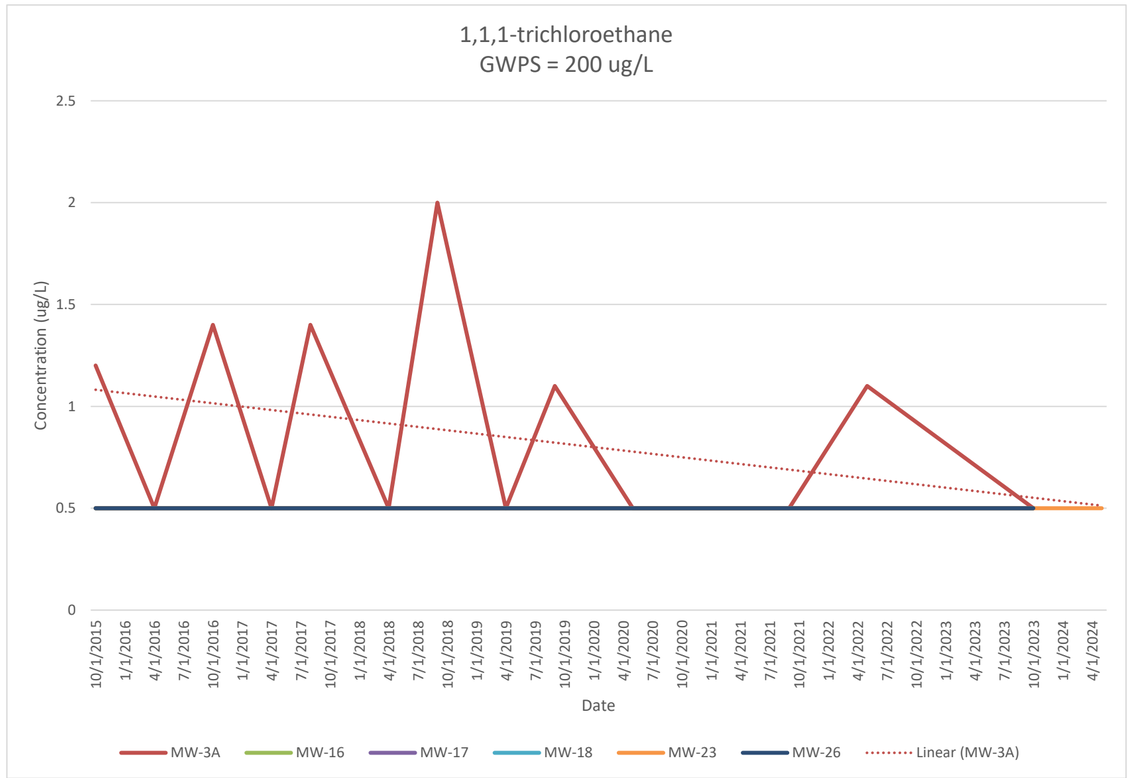
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	1,1,1-Trichloroethane	200	**1.2**	0.5	0.5	0.5	0.5	0.5
4/13/2016	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	1,1,1-Trichloroethane	200	**1.4**	0.5	0.5	0.5	0.5	0.5
4/3/2017	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
8/29/2017	1,1,1-Trichloroethane	200	**1.4**	0.5	0.5	0.5	0.5	0.5
4/17/2018	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	1,1,1-Trichloroethane	200	**2**	0.5	0.5	0.5	0.5	0.5
4/9/2019	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	1,1,1-Trichloroethane	200	**1.1**	0.5	0.5	0.5	0.5	0.5
5/11/2020	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
4/22/2021	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
5/18/2022	1,1,1-Trichloroethane	200	**1.1**	0.5	0.5	0.5	0.5	0.5
10/19/2023	1,1,1-Trichloroethane	200	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	1,1,1-Trichloroethane	200					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.65	0.5	0.5	0.5	0.5	0.5
standard deviation			0.259808	0	0	0	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0.091856	0	0	0	0	0
Margin of Error			0.174067	0	0	0	0	0
95% UCL (mean + Margin of Error)			**0.824067**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**0.475933**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
GWPS (ug/L)			**200**	**200**	**200**	**200**	**200**	**200**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
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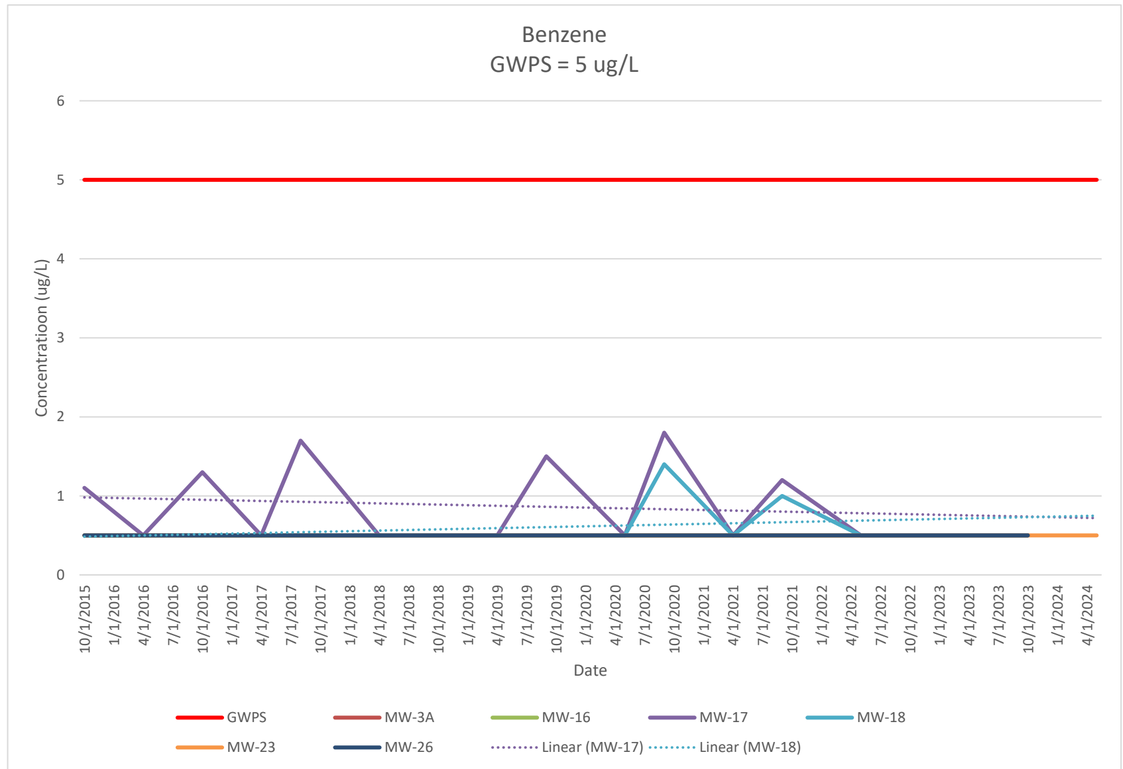
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	benzene	5	0.5	0.5	**1.1**	0.5	0.5	0.5
4/13/2016	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	benzene	5	0.5	0.5	**1.3**	0.5	0.5	0.5
4/3/2017	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
8/29/2017	benzene	5	0.5	0.5	**1.7**	0.5	0.5	0.5
4/17/2018	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
4/9/2019	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	benzene	5	0.5	0.5	**1.5**	0.5	0.5	0.5
5/11/2020	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	benzene	5	0.5	0.5	**1.8**	**1.4**	0.5	0.5
4/22/2021	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	benzene	5	0.5	0.5	**1.2**	**1**	0.5	0.5
5/18/2022	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
10/19/2023	benzene	5	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	benzene	5					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.5	0.875	0.675	0.5	0.5
standard deviation			0	0	0.506828	0.319179	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	0.179191	0.112847	0	0
Margin of Error			0	0	0.339567	0.213844	0	0
95% UCL (mean + Margin of Error)			**0.5**	**0.5**	**1.214567**	**0.888844**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5**	**0.535433**	**0.461156**	**0.5**	**0.5**
GWPS (ug/L)			**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
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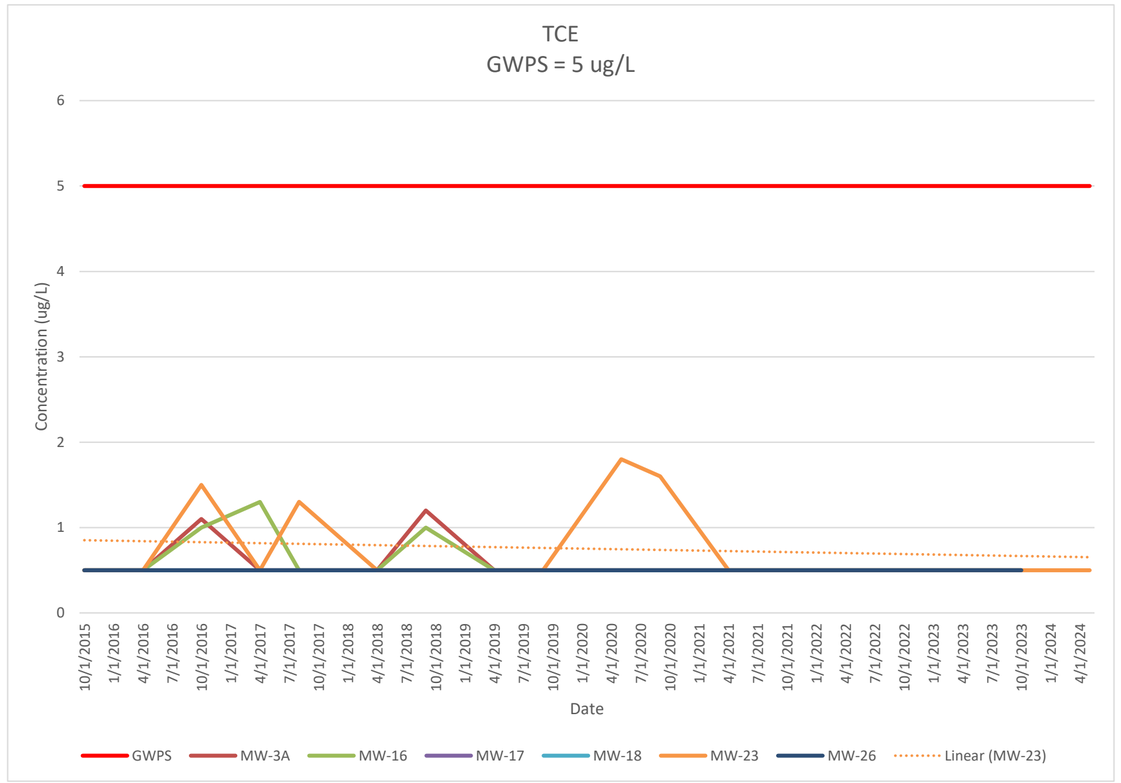
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
4/13/2016	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	TCE	5	**1.1**	**1**	0.5	0.5	**1.5**	0.5
4/3/2017	TCE	5	0.5	**1.3**	0.5	0.5	0.5	0.5
8/29/2017	TCE	5	0.5	0.5	0.5	0.5	**1.3**	0.5
4/17/2018	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/17/2018	TCE	5	**1.2**	**1**	0.5	0.5	0.5	0.5
4/9/2019	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
5/11/2020	TCE	5	0.5	0.5	0.5	0.5	**1.8**	0.5
9/21/2020	TCE	5	0.5	0.5	0.5	0.5	**1.6**	0.5
4/22/2021	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
5/18/2022	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
10/19/2023	TCE	5	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	TCE	5					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.5	0.5	0.5	0.766667	0.5
standard deviation			0	0	0	0	0.50111	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	0	0	0.177169	0
Margin of Error			0	0	0	0	0.335735	0
95% UCL (mean + Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**1.102402**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5**	**0.5**	**0.5**	**0.430931**	**0.5**
GWPS (ug/L)			**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
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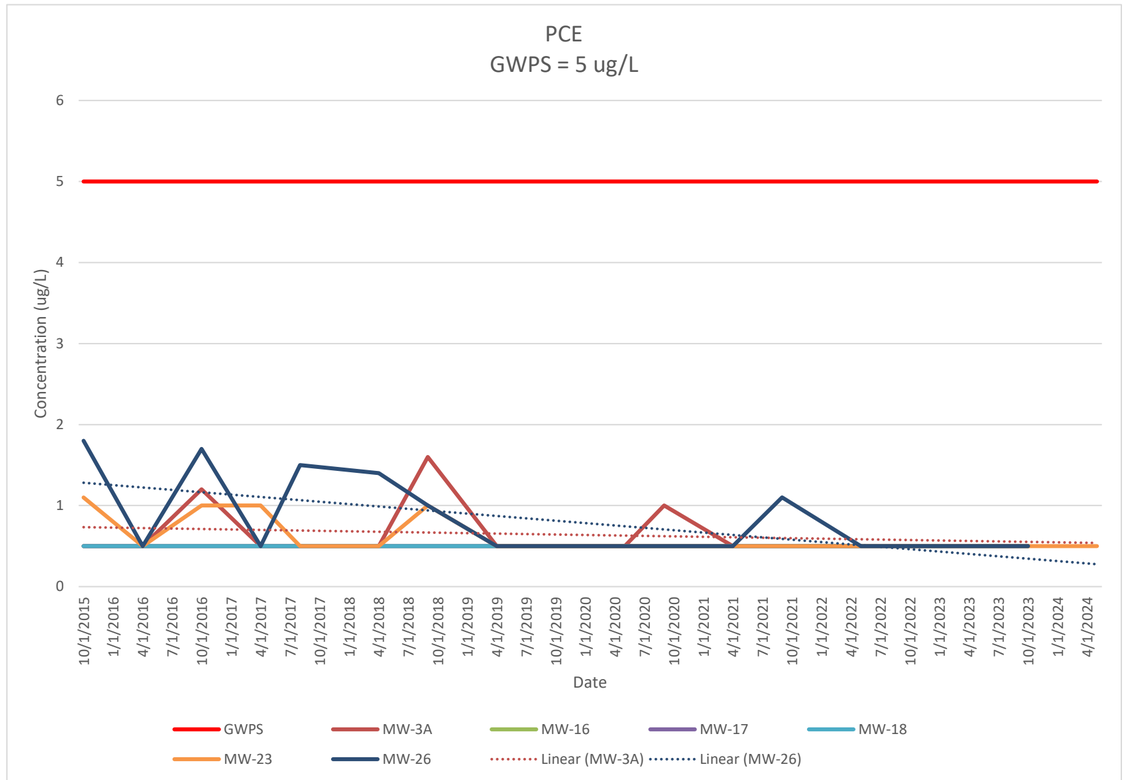
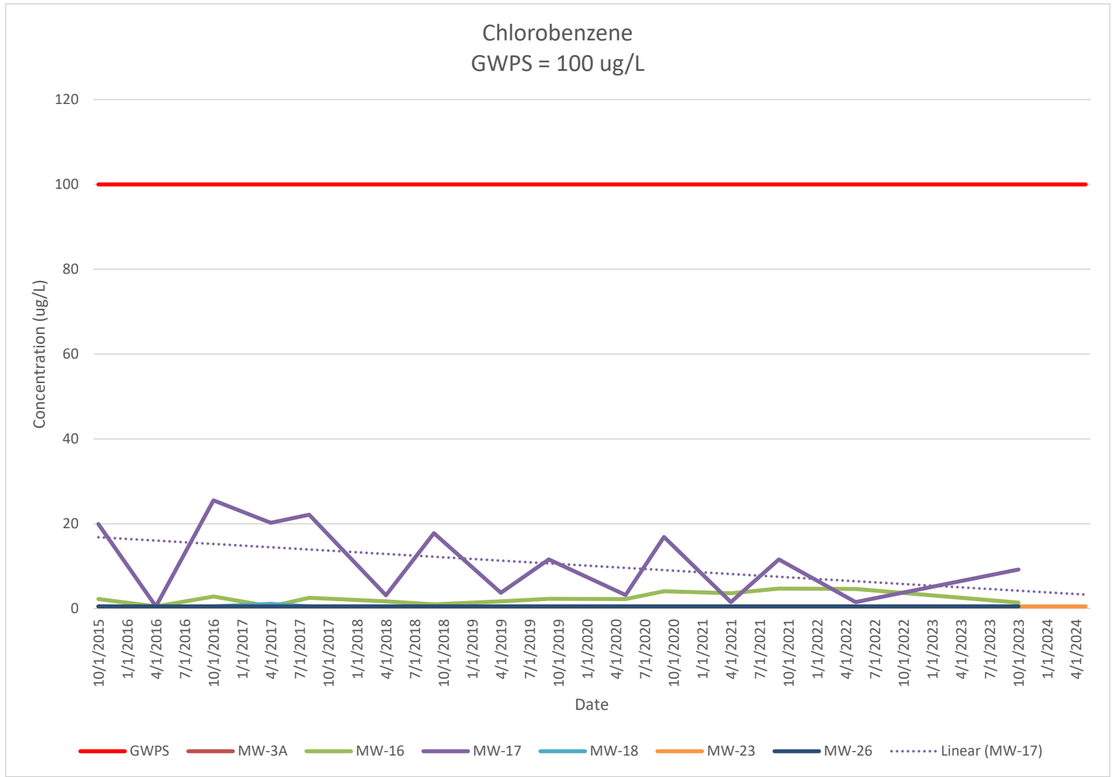
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	PCE	5	0.5	0.5	0.5	0.5	**1.1**	**1.8**
4/13/2016	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	PCE	5	**1.2**	0.5	0.5	0.5	**1**	**1.7**
4/3/2017	PCE	5	0.5	0.5	0.5	0.5	**1**	0.5
8/29/2017	PCE	5	0.5	0.5	0.5	0.5	0.5	**1.5**
4/17/2018	PCE	5	0.5	0.5	0.5	0.5	0.5	**1.4**
9/17/2018	PCE	5	**1.6**	0.5	0.5	0.5	**1**	**1**
4/9/2019	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/4/2019	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
5/11/2020	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/21/2020	PCE	5	**1**	0.5	0.5	0.5	0.5	0.5
4/22/2021	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
9/13/2021	PCE	5	0.5	0.5	0.5	0.5	0.5	**1.1**
5/18/2022	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
10/19/2023	PCE	5	0.5	0.5	0.5	0.5	0.5	0.5
5/29/2024	PCE	5					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5625	0.5	0.5	0.5	0.5	0.575
standard deviation			0.165359	0	0	0	0	0.198431
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0.058463	0	0	0	0	0.070156
Margin of Error			0.110788	0	0	0	0	0.132946
95% UCL (mean + Margin of Error)			**0.673288**	**0.5**	**0.5**	**0.5**	**0.5**	**0.707946**
95% LCL (mean - Margin of Error)			**0.451712**	**0.5**	**0.5**	**0.5**	**0.5**	**0.442054**
GWPS (ug/L)			**5.0**	**5.0**	**5.0**	**5.0**	**5.0**	**5.0**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

0.5 = Red text represent undetected values that are reported at one-half of the MRL

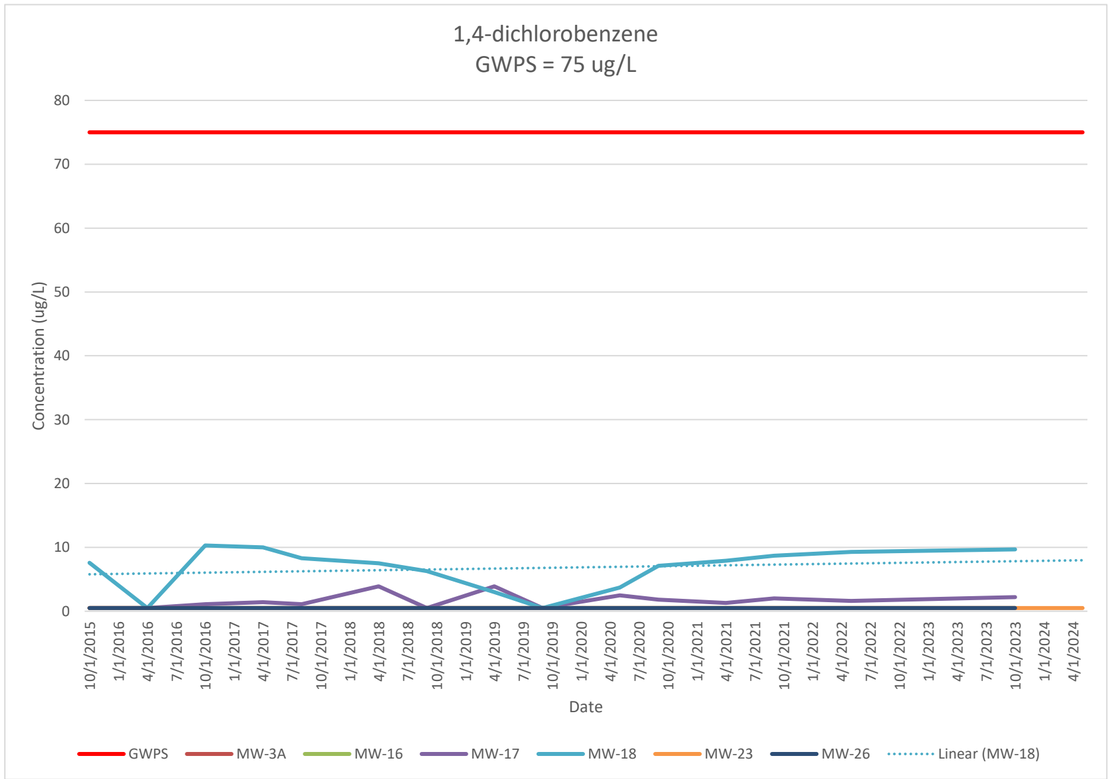
Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	chlorobenzene	100	0.5	**2.2**	**19.9**	0.5	0.5	0.5
4/13/2016	chlorobenzene	100	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	chlorobenzene	100	0.5	**2.8**	**25.5**	0.5	0.5	0.5
4/3/2017	chlorobenzene	100	0.5	0.5	**20.2**	**1.1**	0.5	0.5
8/29/2017	chlorobenzene	100	0.5	**2.5**	**22.1**	0.5	0.5	0.5
4/17/2018	chlorobenzene	100	0.5	**1.7**	**3.1**	0.5	0.5	0.5
9/17/2018	chlorobenzene	100	0.5	**1**	**17.8**	0.5	0.5	0.5
4/9/2019	chlorobenzene	100	0.5	**1.7**	**3.7**	0.5	0.5	0.5
9/4/2019	chlorobenzene	100	0.5	**2.3**	**11.6**	0.5	0.5	0.5
5/11/2020	chlorobenzene	100	0.5	**2.2**	**3.2**	0.5	0.5	0.5
9/21/2020	chlorobenzene	100	0.5	**4.1**	**16.9**	0.5	0.5	0.5
4/22/2021	chlorobenzene	100	0.5	**3.6**	**1.5**	0.5	0.5	0.5
9/13/2021	chlorobenzene	100	0.5	**4.7**	**11.6**	0.5	0.5	0.5
5/18/2022	chlorobenzene	100	0.5	**4.6**	**1.5**	0.5	0.5	0.5
10/19/2023	chlorobenzene	100	0.5	**1.4**	**9.2**	0.5	0.5	0.5
5/29/2024	chlorobenzene	100					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	3.075	7.4	0.5	0.5	0.5
standard deviation			0	1.242729	5.358638	0	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0.439371	1.894565	0	0	0
Margin of Error			0	0.832608	3.5902	0	0	0
95% UCL (mean + Margin of Error)			**0.5**	**3.907608**	**10.9902**	**0.5**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**2.242392**	**3.8098**	**0.5**	**0.5**	**0.5**
GWPS (ug/L)			**100**	**100**	**100**	**100**	**100**	**100**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



Times Series Graphs
Cedar County Sanitary Landfill
16-SDP-01-76C

0.5 = Red text represent undetected values that are reported at one-half of the MRL

Date	Compound (ug/L)	GWPS	MW-3A	MW-16	MW-17	MW-18	MW-23	MW-26
10/5/2015	1,4-Dichlorobenzene	75	0.5	0.5	0.5	**7.6**	0.5	0.5
4/13/2016	1,4-Dichlorobenzene	75	0.5	0.5	0.5	0.5	0.5	0.5
10/4/2016	1,4-Dichlorobenzene	75	0.5	0.5	**1.1**	**10.3**	0.5	0.5
4/3/2017	1,4-Dichlorobenzene	75	0.5	0.5	**1.4**	**10**	0.5	0.5
8/29/2017	1,4-Dichlorobenzene	75	0.5	0.5	**1.1**	**8.3**	0.5	0.5
4/17/2018	1,4-Dichlorobenzene	75	0.5	0.5	**3.9**	**7.5**	0.5	0.5
9/17/2018	1,4-Dichlorobenzene	75	0.5	0.5	0.5	**6.3**	0.5	0.5
4/9/2019	1,4-Dichlorobenzene	75	0.5	0.5	**3.9**	**3**	0.5	0.5
9/4/2019	1,4-Dichlorobenzene	75	0.5	0.5	0.5	0.5	0.5	0.5
5/11/2020	1,4-Dichlorobenzene	75	0.5	0.5	**2.5**	**3.7**	0.5	0.5
9/21/2020	1,4-Dichlorobenzene	75	0.5	0.5	**1.8**	**7.1**	0.5	0.5
4/22/2021	1,4-Dichlorobenzene	75	0.5	0.5	**1.3**	**7.9**	0.5	0.5
9/13/2021	1,4-Dichlorobenzene	75	0.5	0.5	**2**	**8.7**	0.5	0.5
5/18/2022	1,4-Dichlorobenzene	75	0.5	0.5	**1.6**	**9.3**	0.5	0.5
10/19/2023	1,4-Dichlorobenzene	75	0.5	0.5	**2.2**	**9.7**	0.5	0.5
5/29/2024	1,4-Dichlorobenzene	75					0.5	
Sample size = 8			8	8	8	8	8	8
Mean value			0.5	0.5	1.975	6.2375	0.5	0.5
standard deviation			0	0	0.924324	3.177632	0	0
95% Confidence Z(0.95)			1.895	1.895	1.895	1.895	1.895	1.895
Standard Error (ST Dev/√8)			0	0	0.326798	1.123462	0	0
Margin of Error			0	0	0.619282	2.128961	0	0
95% UCL (mean + Margin of Error)			**0.5**	**0.5**	**2.594282**	**8.366461**	**0.5**	**0.5**
95% LCL (mean - Margin of Error)			**0.5**	**0.5**	**1.355718**	**4.108539**	**0.5**	**0.5**
GWPS (ug/L)			**75**	**75**	**75**	**75**	**75**	**75**
Does 95% LCL Value exceed GWPS?	If so, then SSL		**No**	**No**	**No**	**No**	**No**	**No**



CEDAR COUNTY SANITARY LANDFILL
PERMIT # 16-SDP-1-76C

Date: May 29, 2024 Sampled by: Todd Whipple Weather: Sunny, calm, 57-65 F

Well # Ground Water

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-3A (dg)	794.12	37.00	Static gw level		14.10	780.02				
	Capped	YES	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: -- Gas 0%							

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-16 (dg)	813.35	30.81	Static gw level		22.79	790.56				
	Capped	NO	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: -- Gas 17%LEL							

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-17 (dg)	818.11	29.91	Static gw level		21.34	796.77				
	Capped	YES	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: -- Gas 0%							

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-18 (dg)	822.50	30.41	Static gw level		23.04	799.46				
	Capped	YES	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: -- Gas 43%LEL							

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-23 (dg)	826.94	37.45	Static gw level	8:30	32.06	794.88			No	4.82
	Capped	YES	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: Dead ants, 0% gas							

	TOC	Depth	2" dia.	Time	Depth	Elevation	Gallons	# of Vol.	Dry?	NTU
MW-26 (dg)	814.57	30.45	Static gw level		11.15	803.42				
	Capped	YES	After Pumping				Bailer for metals			
	Standing Water	NO					Dedicated Waterra Inertia pumped			
	Litter	NO	Comments: -- Gas 0%							

Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1HE2315

Project Description

Appendix Sampling

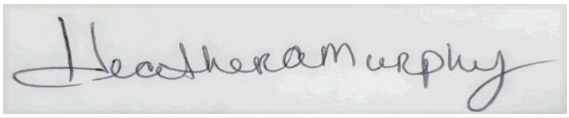
For:

Todd Whipple

HLW Engineering

PO Box 314

Story City, IA 50248



Heather Murphy

Customer Relationship Specialist

Friday, June 7, 2024

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Microbac Laboratories, Inc., Newton. If you have any questions, comments, or require further assistance regarding this report, please contact your service representative listed above.

I certify that all test results meet all of the requirements of the accrediting authority listed within this report. Analytical results are reported on a 'as received' basis unless specified otherwise. Analytical results for solids with units ending in (dry) are reported on a dry weight basis. A statement of uncertainty for each analysis is available upon request. This laboratory report shall not be reproduced, except in full, without the written approval of Microbac Laboratories. The reported results are related only to the samples analyzed as received.

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Microbac Laboratories, Inc., Newton

CERTIFICATE OF ANALYSIS

1HE2315

HLW Engineering

Todd Whipple
PO Box 314
Story City, IA 50248

Project Name: Appendix Sampling

Project / PO Number: N/A
Received: 05/30/2024
Reported: 06/07/2024

Sample Summary Report

Sample Name	Laboratory ID	Client Matrix	Sample Type	Sample Begin	Sample Taken	Lab Received
MW-23	1HE2315-01	Aqueous	GRAB		05/29/24 08:30	05/30/24 10:10

Analytical Testing Parameters

Client Sample ID:	MW-23		
Sample Matrix:	Aqueous	**Collected By:**	Whipple, Tood
Lab Sample ID:	1HE2315-01	**Collection Date:**	05/29/2024 8:30

Determination of Volatile Organic Compounds	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 5030B/EPA 8260B								
Chloromethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Vinyl Chloride	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Bromomethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Chloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Trichlorofluoromethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1-Dichloroethylene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Acetone	<10.0	10.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Methyl Iodide	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Carbon Disulfide	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Methylene Chloride	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Acrylonitrile	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1-Dichloroethane	**11.1**	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Vinyl Acetate	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
cis-1,2-Dichloroethylene	**11.2**	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
2-Butanone (MEK)	<10.0	10.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Bromochloromethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Chloroform	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1,1-Trichloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Carbon Tetrachloride	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Benzene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2-Dichloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Trichloroethylene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2-Dichloropropane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Dibromomethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Bromodichloromethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
cis-1,3-Dichloropropene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Toluene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
trans-1,3-Dichloropropene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1,2-Trichloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Tetrachloroethylene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
2-Hexanone (MBK)	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Dibromochloromethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2-Dibromoethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Chlorobenzene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Ethylbenzene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Xylenes, total	<2.0	2.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Styrene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH

Client Sample ID:	MW-23		
Sample Matrix:	Aqueous	**Collected By:**	Whipple, Tood
Lab Sample ID:	1HE2315-01	**Collection Date:**	05/29/2024 8:30

Determination of Volatile Organic Compounds	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
Bromoform	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2,3-Trichloropropane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,4-Dichlorobenzene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2-Dichlorobenzene	<1.0	1.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: Dibromofluoromethane	84.5	Limit: 80-126	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: Dibromofluoromethane	84.5	Limit: 75-136	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: 1,2-Dichloroethane-d4	91.4	Limit: 61-142	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: 1,2-Dichloroethane-d4	91.4	Limit: 63-138	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: Toluene-d8	97.8	Limit: 87-116	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: Toluene-d8	97.8	Limit: 82-121	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: 4-Bromofluorobenzene	97.4	Limit: 85-111	% Rec	1		06/05/24 0000	06/05/24 2041	LNH
Surrogate: 4-Bromofluorobenzene	97.4	Limit: 80-116	% Rec	1		06/05/24 0000	06/05/24 2041	LNH

Determination of Total Metals	Result	RL	Units	DF	Note	Prepared	Analyzed	Analyst
EPA 3005A/EPA 6020A								
Antimony, total	<0.0020	0.0020	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Arsenic, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Barium, total	**0.339**	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Beryllium, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Cadmium, total	<0.0008	0.0008	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Chromium, total	<0.0080	0.0080	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Cobalt, total	**0.0022**	0.0004	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Copper, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Lead, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Nickel, total	**0.0079**	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Selenium, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Silver, total	<0.0040	0.0040	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Thallium, total	<0.0020	0.0020	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Vanadium, total	<0.0200	0.0200	mg/L	4		05/31/24 1616	06/03/24 1957	RVV
Zinc, total	<0.0200	0.0200	mg/L	4		05/31/24 1616	06/03/24 1957	RVV

Batch Log Summary

Method	Batch	Laboratory ID	Client / Source ID
EPA 6020A	1HE1770	1HE1770-BLK1	
		1HE1770-BS1	
		1HE2315-01	MW-23
		1HE1770-MS1	1HE2315-01
		1HE1770-MSD1	1HE2315-01
		1HE1770-PS1	1HE2315-01

Method	Batch	Laboratory ID	Client / Source ID
EPA 8260B	1HF0244	1HF0244-BS1	
		1HF0244-BSD1	
		1HF0244-BLK1	
		1HE2315-01	MW-23
		1HF0244-MS1	1HE1961-01
		1HF0244-MSD1	1HE1961-01

Batch Quality Control Summary: Microbac Laboratories, Inc., Newton

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
Blank (1HF0244-BLK1)			Prepared: 06/05/24 00:00 Analyzed: 06/05/24 14:20							
Chloromethane	<1.0	1.0	ug/L							
Vinyl Chloride	<1.0	1.0	ug/L							
Bromomethane	<1.0	1.0	ug/L							
Chloroethane	<1.0	1.0	ug/L							
Trichlorofluoromethane	<1.0	1.0	ug/L							
1,1-Dichloroethylene	<1.0	1.0	ug/L							
Acetone	<10.0	10.0	ug/L							
Methyl Iodide	<1.0	1.0	ug/L							
Carbon Disulfide	<1.0	1.0	ug/L							
Methylene Chloride	<5.0	5.0	ug/L							
Acrylonitrile	<5.0	5.0	ug/L							
trans-1,2-Dichloroethylene	<1.0	1.0	ug/L							
1,1-Dichloroethane	<1.0	1.0	ug/L							
Vinyl Acetate	<5.0	5.0	ug/L							
cis-1,2-Dichloroethylene	<1.0	1.0	ug/L							
2-Butanone (MEK)	<10.0	10.0	ug/L							
Bromochloromethane	<1.0	1.0	ug/L							
Chloroform	<1.0	1.0	ug/L							
1,1,1-Trichloroethane	<1.0	1.0	ug/L							
Carbon Tetrachloride	<1.0	1.0	ug/L							
Benzene	<1.0	1.0	ug/L							
1,2-Dichloroethane	<1.0	1.0	ug/L							

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
Blank (1HF0244-BLK1)				Prepared: 06/05/24 00:00 Analyzed: 06/05/24 14:20						
Trichloroethylene	<1.0	1.0	ug/L							
1,2-Dichloropropane	<1.0	1.0	ug/L							
Dibromomethane	<1.0	1.0	ug/L							
Bromodichloromethane	<1.0	1.0	ug/L							
cis-1,3-Dichloropropene	<1.0	1.0	ug/L							
4-Methyl-2-pentanone (MIBK)	<5.0	5.0	ug/L							
Toluene	<1.0	1.0	ug/L							
trans-1,3-Dichloropropene	<1.0	1.0	ug/L							
1,1,2-Trichloroethane	<1.0	1.0	ug/L							
Tetrachloroethylene	<1.0	1.0	ug/L							
2-Hexanone (MBK)	<5.0	5.0	ug/L							
Dibromochloromethane	<1.0	1.0	ug/L							
1,2-Dibromoethane	<1.0	1.0	ug/L							
Chlorobenzene	<1.0	1.0	ug/L							
1,1,1,2-Tetrachloroethane	<1.0	1.0	ug/L							
Ethylbenzene	<1.0	1.0	ug/L							
Xylenes, total	<2.0	2.0	ug/L							
Styrene	<1.0	1.0	ug/L							
Bromoform	<1.0	1.0	ug/L							
1,2,3-Trichloropropane	<1.0	1.0	ug/L							
trans-1,4-Dichloro-2-butene	<5.0	5.0	ug/L							
1,1,2,2-Tetrachloroethane	<1.0	1.0	ug/L							
1,4-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dichlorobenzene	<1.0	1.0	ug/L							
1,2-Dibromo-3-chloropropane	<5.0	5.0	ug/L							
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*80-126*			
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*75-136*			
Surrogate: 1,2-Dichloroethane-d4	*45.1*		ug/L	*50.1*		*90.1*	*63-138*			
Surrogate: 1,2-Dichloroethane-d4	*45.1*		ug/L	*50.1*		*90.1*	*61-142*			
Surrogate: Toluene-d8	*48.8*		ug/L	*50.4*		*96.9*	*87-116*			
Surrogate: Toluene-d8	*48.8*		ug/L	*50.4*		*96.9*	*82-121*			
Surrogate: 4-Bromofluorobenzene	*49.1*		ug/L	*50.1*		*97.9*	*85-111*			
Surrogate: 4-Bromofluorobenzene	*49.1*		ug/L	*50.1*		*97.9*	*80-116*			
LCS (1HF0244-BS1)				Prepared: 06/05/24 00:00 Analyzed: 06/05/24 13:12						
Chloromethane	28.50	1.0	ug/L	30.6		93.0	63-155			
Vinyl Chloride	27.10	1.0	ug/L	30.2		89.7	70-154			
Bromomethane	27.98	1.0	ug/L	28.8		97.2	52-176			
Chloroethane	28.84	1.0	ug/L	31.6		91.2	72-148			
Trichlorofluoromethane	26.72	1.0	ug/L	32.6		81.9	70-152			
1,1-Dichloroethylene	40.40	1.0	ug/L	50.0		80.8	70-148			
Acetone	89.83	10.0	ug/L	101		88.8	43-172			
Methyl Iodide	91.08	1.0	ug/L	102		89.4	69-170			
Carbon Disulfide	86.20	1.0	ug/L	103		83.9	72-162			

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
LCS (1HF0244-BS1)			Prepared: 06/05/24 00:00 Analyzed: 06/05/24 13:12							
Methylene Chloride	39.97	5.0	ug/L	50.0		79.9	68-142			
Acrylonitrile	75.92	5.0	ug/L	100		75.5	67-144			
trans-1,2-Dichloroethylene	42.92	1.0	ug/L	50.0		85.8	66-148			
1,1-Dichloroethane	42.70	1.0	ug/L	50.0		85.4	66-143			
Vinyl Acetate	103.6	5.0	ug/L	100		104	43-153			
cis-1,2-Dichloroethylene	51.97	1.0	ug/L	50.0		104	71-149			
2-Butanone (MEK)	81.04	10.0	ug/L	102		79.6	52-159			
Bromochloromethane	44.19	1.0	ug/L	50.0		88.4	69-143			
Chloroform	41.23	1.0	ug/L	50.0		82.5	69-144			
1,1,1-Trichloroethane	40.24	1.0	ug/L	50.0		80.5	62-129			
Carbon Tetrachloride	43.11	1.0	ug/L	50.0		86.2	63-141			
Benzene	47.56	1.0	ug/L	50.0		95.1	71-134			
1,2-Dichloroethane	49.23	1.0	ug/L	50.0		98.5	72-132			
Trichloroethylene	47.27	1.0	ug/L	50.0		94.5	71-135			
1,2-Dichloropropane	50.02	1.0	ug/L	50.0		100	69-136			
Dibromomethane	49.35	1.0	ug/L	50.0		98.7	73-147			
Bromodichloromethane	49.31	1.0	ug/L	50.0		98.6	68-129			
cis-1,3-Dichloropropene	48.70	1.0	ug/L	50.0		97.4	65-134			
4-Methyl-2-pentanone (MIBK)	104.0	5.0	ug/L	100		104	58-147			
Toluene	46.25	1.0	ug/L	50.0		92.5	72-133			
trans-1,3-Dichloropropene	49.79	1.0	ug/L	50.0		99.6	67-130			
1,1,2-Trichloroethane	49.78	1.0	ug/L	50.0		99.6	69-135			
Tetrachloroethylene	48.22	1.0	ug/L	50.0		96.4	69-130			
2-Hexanone (MBK)	108.4	5.0	ug/L	99.3		109	55-144			
Dibromochloromethane	52.17	1.0	ug/L	50.0		104	73-127			
1,2-Dibromoethane	51.80	1.0	ug/L	50.0		104	67-132			
Chlorobenzene	49.28	1.0	ug/L	50.0		98.6	72-123			
1,1,1,2-Tetrachloroethane	50.69	1.0	ug/L	50.0		101	73-127			
Ethylbenzene	50.30	1.0	ug/L	50.0		101	71-127			
Xylenes, total	152.3	2.0	ug/L	150		102	74-127			
Styrene	53.00	1.0	ug/L	50.0		106	66-126			
Bromoform	50.08	1.0	ug/L	50.0		100	68-130			
1,2,3-Trichloropropane	50.57	1.0	ug/L	50.0		101	63-136			
trans-1,4-Dichloro-2-butene	92.29	5.0	ug/L	103		89.8	54-134			
1,1,2,2-Tetrachloroethane	52.42	1.0	ug/L	50.0		105	61-131			
1,4-Dichlorobenzene	49.02	1.0	ug/L	50.0		98.0	70-129			
1,2-Dichlorobenzene	51.68	1.0	ug/L	50.0		103	69-126			
1,2-Dibromo-3-chloropropane	49.68	5.0	ug/L	50.0		99.4	50-143			
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*80-126*			
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*75-136*			
Surrogate: 1,2-Dichloroethane-d4	*43.1*		ug/L	*50.1*		*86.1*	*63-138*			
Surrogate: 1,2-Dichloroethane-d4	*43.1*		ug/L	*50.1*		*86.1*	*61-142*			
Surrogate: Toluene-d8	*49.0*		ug/L	*50.4*		*97.3*	*87-116*			

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
LCS (1HF0244-BS1)			Prepared: 06/05/24 00:00 Analyzed: 06/05/24 13:12							
Surrogate: Toluene-d8	*49.0*		ug/L	*50.4*		*97.3*	*82-121*			
Surrogate: 4-Bromofluorobenzene	*50.4*		ug/L	*50.1*		*100*	*85-111*			
Surrogate: 4-Bromofluorobenzene	*50.4*		ug/L	*50.1*		*100*	*80-116*			
LCS Dup (1HF0244-BSD1)			Prepared: 06/05/24 00:00 Analyzed: 06/05/24 13:35							
Chloromethane	30.11	1.0	ug/L	30.6		98.3	63-155	5.49	24	
Vinyl Chloride	28.84	1.0	ug/L	30.2		95.4	70-154	6.22	25	
Bromomethane	29.14	1.0	ug/L	28.8		101	52-176	4.06	27	
Chloroethane	30.61	1.0	ug/L	31.6		96.8	72-148	5.95	25	
Trichlorofluoromethane	28.42	1.0	ug/L	32.6		87.2	70-152	6.17	26	
1,1-Dichloroethylene	42.62	1.0	ug/L	50.0		85.2	70-148	5.35	24	
Acetone	89.95	10.0	ug/L	101		88.9	43-172	0.133	30	
Methyl Iodide	95.22	1.0	ug/L	102		93.5	69-170	4.44	30	
Carbon Disulfide	90.75	1.0	ug/L	103		88.4	72-162	5.14	24	
Methylene Chloride	40.78	5.0	ug/L	50.0		81.6	68-142	2.01	21	
Acrylonitrile	77.69	5.0	ug/L	100		77.3	67-144	2.30	24	
trans-1,2-Dichloroethylene	45.05	1.0	ug/L	50.0		90.1	66-148	4.84	27	
1,1-Dichloroethane	44.52	1.0	ug/L	50.0		89.0	66-143	4.17	24	
Vinyl Acetate	102.4	5.0	ug/L	100		102	43-153	1.20	30	
cis-1,2-Dichloroethylene	53.72	1.0	ug/L	50.0		107	71-149	3.31	26	
2-Butanone (MEK)	88.39	10.0	ug/L	102		86.8	52-159	8.68	27	
Bromochloromethane	44.38	1.0	ug/L	50.0		88.8	69-143	0.429	23	
Chloroform	42.49	1.0	ug/L	50.0		85.0	69-144	3.01	23	
1,1,1-Trichloroethane	42.50	1.0	ug/L	50.0		85.0	62-129	5.46	24	
Carbon Tetrachloride	45.66	1.0	ug/L	50.0		91.3	63-141	5.75	25	
Benzene	49.63	1.0	ug/L	50.0		99.3	71-134	4.26	24	
1,2-Dichloroethane	50.04	1.0	ug/L	50.0		100	72-132	1.63	24	
Trichloroethylene	49.57	1.0	ug/L	50.0		99.1	71-135	4.75	24	
1,2-Dichloropropane	51.16	1.0	ug/L	50.0		102	69-136	2.25	24	
Dibromomethane	50.06	1.0	ug/L	50.0		100	73-147	1.43	25	
Bromodichloromethane	50.23	1.0	ug/L	50.0		100	68-129	1.85	22	
cis-1,3-Dichloropropene	49.64	1.0	ug/L	50.0		99.3	65-134	1.91	23	
4-Methyl-2-pentanone (MIBK)	105.1	5.0	ug/L	100		105	58-147	1.03	27	
Toluene	48.50	1.0	ug/L	50.0		97.0	72-133	4.75	24	
trans-1,3-Dichloropropene	50.46	1.0	ug/L	50.0		101	67-130	1.34	24	
1,1,2-Trichloroethane	50.70	1.0	ug/L	50.0		101	69-135	1.83	23	
Tetrachloroethylene	50.55	1.0	ug/L	50.0		101	69-130	4.72	25	
2-Hexanone (MBK)	108.6	5.0	ug/L	99.3		109	55-144	0.240	25	
Dibromochloromethane	53.27	1.0	ug/L	50.0		107	73-127	2.09	22	
1,2-Dibromoethane	52.28	1.0	ug/L	50.0		105	67-132	0.922	24	
Chlorobenzene	50.95	1.0	ug/L	50.0		102	72-123	3.33	23	
1,1,1,2-Tetrachloroethane	52.36	1.0	ug/L	50.0		105	73-127	3.24	24	
Ethylbenzene	52.66	1.0	ug/L	50.0		105	71-127	4.58	26	

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
LCS Dup (1HF0244-BSD1)			Prepared: 06/05/24 00:00 Analyzed: 06/05/24 13:35							
Xylenes, total	158.2	2.0	ug/L	150		105	74-127	3.76	25	
Styrene	54.71	1.0	ug/L	50.0		109	66-126	3.18	23	
Bromoform	51.18	1.0	ug/L	50.0		102	68-130	2.17	23	
1,2,3-Trichloropropane	51.16	1.0	ug/L	50.0		102	63-136	1.16	24	
trans-1,4-Dichloro-2-butene	92.78	5.0	ug/L	103		90.3	54-134	0.530	27	
1,1,2,2-Tetrachloroethane	52.67	1.0	ug/L	50.0		105	61-131	0.476	29	
1,4-Dichlorobenzene	50.49	1.0	ug/L	50.0		101	70-129	2.95	24	
1,2-Dichlorobenzene	52.57	1.0	ug/L	50.0		105	69-126	1.71	26	
1,2-Dibromo-3-chloropropane	49.52	5.0	ug/L	50.0		99.0	50-143	0.323	30	
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*80-126*			
Surrogate: Dibromofluoromethane	*42.2*		ug/L	*50.2*		*84.1*	*75-136*			
Surrogate: 1,2-Dichloroethane-d4	*43.7*		ug/L	*50.1*		*87.2*	*63-138*			
Surrogate: 1,2-Dichloroethane-d4	*43.7*		ug/L	*50.1*		*87.2*	*61-142*			
Surrogate: Toluene-d8	*48.9*		ug/L	*50.4*		*97.1*	*87-116*			
Surrogate: Toluene-d8	*48.9*		ug/L	*50.4*		*97.1*	*82-121*			
Surrogate: 4-Bromofluorobenzene	*49.8*		ug/L	*50.1*		*99.4*	*85-111*			
Surrogate: 4-Bromofluorobenzene	*49.8*		ug/L	*50.1*		*99.4*	*80-116*			
Matrix Spike (1HF0244-MS1)	**Source: 1HE1961-01**		Prepared: 06/05/24 00:00 Analyzed: 06/06/24 04:13							
Chloromethane	304.5	10.0	ug/L	306	ND	99.4	61-152			
Vinyl Chloride	291.5	10.0	ug/L	302	ND	96.4	66-149			
Bromomethane	298.8	10.0	ug/L	288	ND	104	43-171			
Chloroethane	306.5	10.0	ug/L	316	ND	96.9	69-148			
Trichlorofluoromethane	284.3	10.0	ug/L	326	ND	87.2	62-163			
1,1-Dichloroethylene	431.4	10.0	ug/L	500	ND	86.3	70-148			
Acetone	945.9	100	ug/L	1010	ND	93.5	45-173			
Methyl Iodide	838.2	10.0	ug/L	1020	ND	82.3	62-167			
Carbon Disulfide	900.4	10.0	ug/L	1030	ND	87.7	71-163			
Methylene Chloride	403.5	50.0	ug/L	500	ND	80.7	69-140			
Acrylonitrile	782.0	50.0	ug/L	1000	ND	77.8	58-151			
trans-1,2-Dichloroethylene	453.2	10.0	ug/L	500	ND	90.6	69-144			
1,1-Dichloroethane	444.3	10.0	ug/L	500	ND	88.9	70-138			
Vinyl Acetate	1019	50.0	ug/L	1000	ND	102	58-142			
cis-1,2-Dichloroethylene	520.8	10.0	ug/L	500	ND	104	68-151			
2-Butanone (MEK)	890.7	100	ug/L	1020	ND	87.5	50-160			
Bromochloromethane	446.8	10.0	ug/L	500	ND	89.4	65-143			
Chloroform	428.4	10.0	ug/L	500	ND	85.7	71-143			
1,1,1-Trichloroethane	427.3	10.0	ug/L	500	ND	85.5	63-133			
Carbon Tetrachloride	461.5	10.0	ug/L	500	ND	92.3	63-142			
Benzene	492.3	10.0	ug/L	500	ND	98.5	69-133			
1,2-Dichloroethane	497.5	10.0	ug/L	500	ND	99.5	63-138			
Trichloroethylene	492.7	10.0	ug/L	500	ND	98.5	71-133			
1,2-Dichloropropane	508.5	10.0	ug/L	500	ND	102	69-132			
Dibromomethane	500.7	10.0	ug/L	500	ND	100	70-147			

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
Matrix Spike (1HF0244-MS1)	**Source: 1HE1961-01**		Prepared: 06/05/24 00:00 Analyzed: 06/06/24 04:13							
Bromodichloromethane	495.3	10.0	ug/L	500	ND	99.1	67-130			
cis-1,3-Dichloropropene	460.1	10.0	ug/L	500	ND	92.0	61-126			
4-Methyl-2-pentanone (MIBK)	1027	50.0	ug/L	1000	ND	103	55-147			
Toluene	479.2	10.0	ug/L	500	ND	95.8	71-133			
trans-1,3-Dichloropropene	469.8	10.0	ug/L	500	ND	94.0	63-124			
1,1,2-Trichloroethane	497.1	10.0	ug/L	500	ND	99.4	69-133			
Tetrachloroethylene	494.3	10.0	ug/L	500	ND	98.9	70-124			
2-Hexanone (MBK)	1072	50.0	ug/L	993	ND	108	53-141			
Dibromochloromethane	512.9	10.0	ug/L	500	ND	103	74-122			
1,2-Dibromoethane	514.6	10.0	ug/L	500	ND	103	66-127			
Chlorobenzene	501.4	10.0	ug/L	500	ND	100	76-116			
1,1,1,2-Tetrachloroethane	513.3	10.0	ug/L	500	ND	103	77-121			
Ethylbenzene	522.0	10.0	ug/L	500	ND	104	73-124			
Xylenes, total	1562	20.0	ug/L	1500	ND	104	75-123			
Styrene	537.1	10.0	ug/L	500	ND	107	70-120			
Bromoform	484.8	10.0	ug/L	500	ND	97.0	70-124			
1,2,3-Trichloropropane	505.3	10.0	ug/L	500	ND	101	62-135			
trans-1,4-Dichloro-2-butene	834.6	50.0	ug/L	1030	ND	81.2	50-120			
1,1,2,2-Tetrachloroethane	527.2	10.0	ug/L	500	ND	105	63-126			
1,4-Dichlorobenzene	489.4	10.0	ug/L	500	ND	97.9	72-119			
1,2-Dichlorobenzene	508.9	10.0	ug/L	500	ND	102	71-117			
1,2-Dibromo-3-chloropropane	471.4	50.0	ug/L	500	ND	94.3	49-134			
Surrogate: Dibromofluoromethane	*427*		ug/L	*502*		*85.2*	*80-126*			
Surrogate: Dibromofluoromethane	*427*		ug/L	*502*		*85.2*	*75-136*			
Surrogate: 1,2-Dichloroethane-d4	*443*		ug/L	*501*		*88.5*	*63-138*			
Surrogate: 1,2-Dichloroethane-d4	*443*		ug/L	*501*		*88.5*	*61-142*			
Surrogate: Toluene-d8	*492*		ug/L	*504*		*97.6*	*87-116*			
Surrogate: Toluene-d8	*492*		ug/L	*504*		*97.6*	*82-121*			
Surrogate: 4-Bromofluorobenzene	*496*		ug/L	*501*		*98.8*	*85-111*			
Surrogate: 4-Bromofluorobenzene	*496*		ug/L	*501*		*98.8*	*80-116*			
Matrix Spike Dup (1HF0244-MSD1)	**Source: 1HE1961-01**		Prepared: 06/05/24 00:00 Analyzed: 06/06/24 04:35							
Chloromethane	291.9	10.0	ug/L	306	ND	95.3	61-152	4.23	26	
Vinyl Chloride	282.1	10.0	ug/L	302	ND	93.3	66-149	3.28	23	
Bromomethane	286.0	10.0	ug/L	288	ND	99.3	43-171	4.38	29	
Chloroethane	297.9	10.0	ug/L	316	ND	94.2	69-148	2.85	25	
Trichlorofluoromethane	276.6	10.0	ug/L	326	ND	84.8	62-163	2.75	25	
1,1-Dichloroethylene	418.6	10.0	ug/L	500	ND	83.7	70-148	3.01	22	
Acetone	961.0	100	ug/L	1010	ND	95.0	45-173	1.58	30	
Methyl Iodide	855.1	10.0	ug/L	1020	ND	83.9	62-167	2.00	24	
Carbon Disulfide	872.5	10.0	ug/L	1030	ND	85.0	71-163	3.15	22	
Methylene Chloride	398.3	50.0	ug/L	500	ND	79.7	69-140	1.30	19	
Acrylonitrile	802.0	50.0	ug/L	1000	ND	79.8	58-151	2.53	15	
trans-1,2-Dichloroethylene	439.0	10.0	ug/L	500	ND	87.8	69-144	3.18	22	

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HF0244 - EPA 5030B - EPA 8260B										
Matrix Spike Dup (1HF0244-MSD1)	**Source: 1HE1961-01**	Prepared: 06/05/24 00:00 Analyzed: 06/06/24 04:35								
1,1-Dichloroethane	434.7	10.0	ug/L	500	ND	86.9	70-138	2.18	20	
Vinyl Acetate	1052	50.0	ug/L	1000	ND	105	58-142	3.16	24	
cis-1,2-Dichloroethylene	513.3	10.0	ug/L	500	ND	103	68-151	1.45	22	
2-Butanone (MEK)	935.3	100	ug/L	1020	ND	91.9	50-160	4.88	23	
Bromochloromethane	445.3	10.0	ug/L	500	ND	89.1	65-143	0.336	22	
Chloroform	422.9	10.0	ug/L	500	ND	84.6	71-143	1.29	21	
1,1,1-Trichloroethane	416.9	10.0	ug/L	500	ND	83.4	63-133	2.46	23	
Carbon Tetrachloride	451.2	10.0	ug/L	500	ND	90.2	63-142	2.26	22	
Benzene	483.7	10.0	ug/L	500	ND	96.7	69-133	1.76	18	
1,2-Dichloroethane	493.3	10.0	ug/L	500	ND	98.7	63-138	0.848	20	
Trichloroethylene	476.2	10.0	ug/L	500	ND	95.2	71-133	3.41	23	
1,2-Dichloropropane	503.6	10.0	ug/L	500	ND	101	69-132	0.968	20	
Dibromomethane	493.3	10.0	ug/L	500	ND	98.7	70-147	1.49	22	
Bromodichloromethane	489.0	10.0	ug/L	500	ND	97.8	67-130	1.28	21	
cis-1,3-Dichloropropene	456.2	10.0	ug/L	500	ND	91.2	61-126	0.851	21	
4-Methyl-2-pentanone (MIBK)	1045	50.0	ug/L	1000	ND	104	55-147	1.70	23	
Toluene	470.6	10.0	ug/L	500	ND	94.1	71-133	1.81	19	
trans-1,3-Dichloropropene	473.0	10.0	ug/L	500	ND	94.6	63-124	0.679	21	
1,1,2-Trichloroethane	501.6	10.0	ug/L	500	ND	100	69-133	0.901	19	
Tetrachloroethylene	477.9	10.0	ug/L	500	ND	95.6	70-124	3.37	24	
2-Hexanone (MBK)	1088	50.0	ug/L	993	ND	110	53-141	1.49	24	
Dibromochloromethane	510.4	10.0	ug/L	500	ND	102	74-122	0.489	21	
1,2-Dibromoethane	511.6	10.0	ug/L	500	ND	102	66-127	0.585	23	
Chlorobenzene	491.5	10.0	ug/L	500	ND	98.3	76-116	1.99	21	
1,1,1,2-Tetrachloroethane	504.4	10.0	ug/L	500	ND	101	77-121	1.75	25	
Ethylbenzene	507.3	10.0	ug/L	500	ND	101	73-124	2.86	20	
Xylenes, total	1523	20.0	ug/L	1500	ND	102	75-123	2.53	20	
Styrene	525.1	10.0	ug/L	500	ND	105	70-120	2.26	23	
Bromoform	489.5	10.0	ug/L	500	ND	97.9	70-124	0.965	22	
1,2,3-Trichloropropane	502.1	10.0	ug/L	500	ND	100	62-135	0.635	28	
trans-1,4-Dichloro-2-butene	836.0	50.0	ug/L	1030	ND	81.3	50-120	0.168	26	
1,1,2,2-Tetrachloroethane	535.1	10.0	ug/L	500	ND	107	63-126	1.49	24	
1,4-Dichlorobenzene	484.5	10.0	ug/L	500	ND	96.9	72-119	1.01	24	
1,2-Dichlorobenzene	506.5	10.0	ug/L	500	ND	101	71-117	0.473	24	
1,2-Dibromo-3-chloropropane	490.3	50.0	ug/L	500	ND	98.1	49-134	3.93	28	
Surrogate: Dibromofluoromethane	*431*		ug/L	*502*		*85.9*	*80-126*			
Surrogate: Dibromofluoromethane	*431*		ug/L	*502*		*85.9*	*75-136*			
Surrogate: 1,2-Dichloroethane-d4	*441*		ug/L	*501*		*88.0*	*63-138*			
Surrogate: 1,2-Dichloroethane-d4	*441*		ug/L	*501*		*88.0*	*61-142*			
Surrogate: Toluene-d8	*491*		ug/L	*504*		*97.5*	*87-116*			
Surrogate: Toluene-d8	*491*		ug/L	*504*		*97.5*	*82-121*			
Surrogate: 4-Bromofluorobenzene	*497*		ug/L	*501*		*99.2*	*85-111*			
Surrogate: 4-Bromofluorobenzene	*497*		ug/L	*501*		*99.2*	*80-116*			

Determination of Volatile Organic Compounds	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Determination of Total Metals	**Result**	**RL**	**Units**	**Spike Level**	**Source Result**	**%REC**	**%REC Limits**	**RPD**	**RPD Limit**	**Notes**
Batch 1HE1770 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Blank (1HE1770-BLK1)				Prepared: 05/31/24 16:16 Analyzed: 06/03/24 19:44						
Antimony, total	<0.0020	0.0020	mg/L							
Arsenic, total	<0.0040	0.0040	mg/L							
Barium, total	<0.0040	0.0040	mg/L							
Beryllium, total	<0.0040	0.0040	mg/L							
Cadmium, total	<0.0008	0.0008	mg/L							
Chromium, total	<0.0080	0.0080	mg/L							
Cobalt, total	<0.0004	0.0004	mg/L							
Copper, total	<0.0040	0.0040	mg/L							QB-12
Lead, total	<0.0040	0.0040	mg/L							
Nickel, total	<0.0040	0.0040	mg/L							
Selenium, total	<0.0040	0.0040	mg/L							
Silver, total	<0.0040	0.0040	mg/L							
Thallium, total	<0.0020	0.0020	mg/L							
Vanadium, total	<0.0200	0.0200	mg/L							QB-12
Zinc, total	<0.0200	0.0200	mg/L							
LCS (1HE1770-BS1)				Prepared: 05/31/24 16:16 Analyzed: 06/03/24 19:50						
Antimony, total	0.0948	0.0020	mg/L	0.100		94.8	80-120			
Arsenic, total	0.0957	0.0040	mg/L	0.100		95.7	80-120			
Barium, total	0.105	0.0040	mg/L	0.100		105	80-120			
Beryllium, total	0.0990	0.0040	mg/L	0.100		99.0	80-120			
Cadmium, total	0.0981	0.0008	mg/L	0.100		98.1	80-120			
Chromium, total	0.0961	0.0080	mg/L	0.100		96.1	80-120			
Cobalt, total	0.105	0.0004	mg/L	0.100		105	80-120			
Copper, total	0.102	0.0040	mg/L	0.100		102	80-120			
Lead, total	0.102	0.0040	mg/L	0.100		102	80-120			
Nickel, total	0.104	0.0040	mg/L	0.100		104	80-120			
Selenium, total	0.0927	0.0040	mg/L	0.100		92.7	80-120			
Silver, total	0.102	0.0040	mg/L	0.100		102	80-120			
Thallium, total	0.100	0.0020	mg/L	0.100		100	80-120			
Vanadium, total	0.105	0.0200	mg/L	0.100		105	80-120			
Zinc, total	0.101	0.0200	mg/L	0.100		101	80-120			
Matrix Spike (1HE1770-MS1)	**Source: 1HE2315-01**			Prepared: 05/31/24 16:16 Analyzed: 06/03/24 20:03						
Antimony, total	0.0952	0.0020	mg/L	0.100	ND	95.2	75-125			
Arsenic, total	0.0999	0.0040	mg/L	0.100	0.0029	97.0	75-125			
Barium, total	0.446	0.0040	mg/L	0.100	0.339	107	75-125			
Beryllium, total	0.0977	0.0040	mg/L	0.100	ND	97.7	75-125			
Cadmium, total	0.0956	0.0008	mg/L	0.100	0.0003	95.3	75-125			
Chromium, total	0.0953	0.0080	mg/L	0.100	0.0007	94.6	75-125			
Cobalt, total	0.106	0.0004	mg/L	0.100	0.0022	103	75-125			
Copper, total	0.0965	0.0040	mg/L	0.100	0.0038	92.7	75-125			

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1HE1770 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Matrix Spike (1HE1770-MS1)	**Source: 1HE2315-01**		Prepared: 05/31/24 16:16 Analyzed: 06/03/24 20:03							
Lead, total	0.0965	0.0040	mg/L	0.100	ND	96.5	75-125			
Nickel, total	0.106	0.0040	mg/L	0.100	0.0079	98.2	75-125			
Selenium, total	0.0893	0.0040	mg/L	0.100	ND	89.3	75-125			
Silver, total	0.101	0.0040	mg/L	0.100	ND	101	75-125			
Thallium, total	0.0978	0.0020	mg/L	0.100	0.0002	97.6	75-125			
Vanadium, total	0.113	0.0200	mg/L	0.100	0.0155	97.2	75-125			
Zinc, total	0.109	0.0200	mg/L	0.100	0.0172	92.1	75-125			
Matrix Spike Dup (1HE1770-MSD1)	**Source: 1HE2315-01**		Prepared: 05/31/24 16:16 Analyzed: 06/03/24 20:21							
Antimony, total	0.0929	0.0020	mg/L	0.100	ND	92.9	75-125	2.45	20	
Arsenic, total	0.0947	0.0040	mg/L	0.100	0.0029	91.8	75-125	5.41	20	
Barium, total	0.433	0.0040	mg/L	0.100	0.339	94.0	75-125	2.88	20	
Beryllium, total	0.0934	0.0040	mg/L	0.100	ND	93.4	75-125	4.47	20	
Cadmium, total	0.0926	0.0008	mg/L	0.100	0.0003	92.3	75-125	3.18	20	
Chromium, total	0.0921	0.0080	mg/L	0.100	0.0007	91.4	75-125	3.35	20	
Cobalt, total	0.102	0.0004	mg/L	0.100	0.0022	99.3	75-125	4.01	20	
Copper, total	0.0928	0.0040	mg/L	0.100	0.0038	89.0	75-125	3.95	20	
Lead, total	0.0913	0.0040	mg/L	0.100	ND	91.3	75-125	5.56	20	
Nickel, total	0.104	0.0040	mg/L	0.100	0.0079	95.8	75-125	2.34	20	
Selenium, total	0.0893	0.0040	mg/L	0.100	ND	89.3	75-125	0.00717	20	
Silver, total	0.0969	0.0040	mg/L	0.100	ND	96.9	75-125	3.78	20	
Thallium, total	0.0941	0.0020	mg/L	0.100	0.0002	94.0	75-125	3.82	20	
Vanadium, total	0.109	0.0200	mg/L	0.100	0.0155	93.8	75-125	3.11	20	
Zinc, total	0.102	0.0200	mg/L	0.100	0.0172	84.5	75-125	7.17	20	
Post Spike (1HE1770-PS1)	**Source: 1HE2315-01**		Prepared: 05/31/24 16:16 Analyzed: 06/03/24 20:27							
Antimony, total	0.0736		mg/L	0.0800	0.0002	91.8	80-120			
Arsenic, total	0.0771		mg/L	0.0800	0.0028	92.8	80-120			
Barium, total	0.415		mg/L	0.0800	0.332	104	80-120			
Beryllium, total	0.0733		mg/L	0.0800	0.00004	91.5	80-120			
Cadmium, total	0.0713		mg/L	0.0800	0.0003	88.7	80-120			
Chromium, total	0.0721		mg/L	0.0800	0.0007	89.3	80-120			
Cobalt, total	0.0820		mg/L	0.0800	0.0022	99.8	80-120			
Copper, total	0.0749		mg/L	0.0800	0.0037	88.9	80-120			
Lead, total	0.0738		mg/L	0.0800	0.0004	91.7	80-120			
Nickel, total	0.0834		mg/L	0.0800	0.0077	94.6	80-120			
Selenium, total	0.0687		mg/L	0.0800	0.0001	85.7	80-120			
Silver, total	0.0760		mg/L	0.0800	0.0003	94.6	80-120			
Thallium, total	0.0756		mg/L	0.0800	0.0002	94.3	80-120			
Vanadium, total	0.0895		mg/L	0.0800	0.0152	92.9	80-120			
Zinc, total	0.0856		mg/L	0.0800	0.0169	85.9	80-120			

Definitions

QB-12:	The analyte was found in the blank at a concentration greater than one-half the reporting limit. However, the concentration of the analyte in the blank was less than the reporting limit so the data was accepted.
RL:	Reporting Limit
RPD:	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 0.0°C

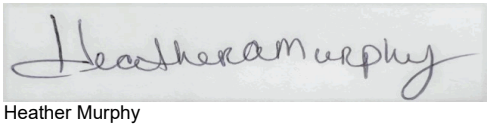
Cooler Inspection Checklist

Custody Seals	No	Containers Intact	Yes
COC/Labels Agree	Yes	Preservation Confirmed	No
Received On Ice	Yes		

Report Comments

The data and information on this, and other accompanying documents, represents only the sample(s) analyzed. This report is incomplete unless all pages indicated in the footnote are present and an authorized signature is included. ***The services were provided under and subject to Microbac's standard terms and conditions which can be located and reviewed at <https://www.microbac.com/standard-terms-conditions>.***

Reviewed and Approved By:



Heather Murphy
Customer Relationship Specialist
heather.murphy@microbac.com
06/07/24 08:01

CHAIN OF CUSTODY RECORD

Keystone LABORATORIES
A Microbac Company

600 East 17th Street Sou
Newton, IA 50208
~~641-792-9451~~

1 H E 2 3 1 5

HLW Engineering
PM: Heather Murphy

SITE INFORMATION

Sampler: Todd Whipple

Project: Cedar Co. - New Regs
Appendix Sampling

REPORT TO

Todd Whipple
HLW Engineering
PO Box 314
Story City, IA 50248

INVOICE TO

Gary Crock
Cedar County Solid Waste Commission
1202 240th St
Tipton, IA 52772

SPECIAL INSTRUCTIONS

None

Turn Around Time

☐ Standard ☐ RUSH, need by ___/___/___

LAB USE ONLY

Work Order 1HE2315
Temperature 0.0
Turn-Cooler: No

- ☐ Custody Seal
- ☐ Containers Intact
- ☐ COC/Labels Agree
- ☐ Preservation Confirmed
- ☒ Received on Ice

Number	Sample Identification / Client ID	Matrix	Sample Type	Date	Time	Number of Containers	Analyses	Lab Sample Number
-001	MW-3A	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	
-001	MW-16	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	
-001	MW-17	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	
-001	MW-18	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	
-001	MW-23	Water	GRAB	5/29/24	8:30	7	lndfill-app1-voc-group lndfll-app1-metals-6020	01
-001	MW-26	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	
-001	Duplicate	Water	GRAB	/ /		0	lndfill-app1-voc-group lndfll-app1-metals-6020	

Relinquished By [signature] Date/Time 5/30/24

Received By Date/Time

Relinquished By Date/Time

Received for Lab By [signature] Date/Time 5-30-24 10:10

Remarks:

Original - Lab Copy Yellow - Sampler Copy

ATTACHMENT B

Gas Monitoring Results 2020 - 2024

Cedar County Landfill Well & Gas Monitoring – May 11, 2020

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	15.92	Above	<1.0%
MW-4	21.50-30.10	20.57	Above	<1.0%
MW-14	16.20-36.20	20.56	Within	3.2%
MW-15	11.30-26.65	12.28	Within	<1.0%
MW-16	15.00-30.81	20.53	Within	100%
MW-17	15.00-29.91	20.30	Within	43.0%
MW-18	10.10-30.41	19.21	Within	60.0%
MW-19	11.80-27.45	17.13	Within	<1.0%
MW-20	12.00-27.00	9.03	Above	<1.0%
MW-23	16.10-37.45	24.99	Within	2.0%
MW-26	8.50-30.45	13.82	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – September 21, 2020

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	19.37	Within	<1.0%
MW-4	21.50-30.10	25.24	Within	<1.0%
MW-14	16.20-36.20	22.24	Within	100.0%
MW-15	11.30-26.65	15.14	Within	<1.0%
MW-16	15.00-30.81	22.78	Within	<1.0%
MW-17	15.00-29.91	21.67	Within	26.0%
MW-18	10.10-30.41	21.79	Within	<1.0%
MW-19	11.80-27.45	20.53	Within	<1.0%
MW-20	12.00-27.00	15.13	Within	<1.0%
MW-23	16.10-37.45	25.39	Within	<1.0%
MW-26	8.50-30.45	12.60	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – April 22, 2021

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	13.49	Above	<1.0%
MW-4	21.50-30.10	18.18	Above	<1.0%
MW-14	16.20-36.20	19.38	Within	25%
MW-15	11.30-26.65	9.26	Above	<1.0%
MW-16	15.00-30.81	20.09	Within	100%
MW-17	15.00-29.91	19.65	Within	30.0%
MW-18	10.10-30.41	18.44	Within	7.0%
MW-19	11.80-27.45	15.43	Within	<1.0%
MW-20	12.00-27.00	7.72	Above	<1.0%
MW-23	16.10-37.45	25.21	Within	<1.0%
MW-26	8.50-30.45	11.70	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – September 13, 2021

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	20.79	Within	<1.0%
MW-4	21.50-30.10	26.98	Within	<1.0%
MW-14	16.20-36.20	22.48	Within	80.0%
MW-15	11.30-26.65	17.54	Within	<1.0%
MW-16	15.00-30.81	23.46	Within	<1.0%
MW-17	15.00-29.91	22.16	Within	18%
MW-18	10.10-30.41	22.27	Within	<1.0%
MW-19	11.80-27.45	22.04	Within	<1.0%
MW-20	12.00-27.00	17.84	Within	<1.0%
MW-23	16.10-37.45	26.45	Within	<1.0%
MW-26	8.50-30.45	15.79	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – May 18, 2022

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	15.05	Above	<1.0%
MW-4	21.50-30.10	23.17	Within	<1.0%
MW-14	16.20-36.20	21.97	Within	48.0%
MW-15	11.30-26.65	11.99	Within	<1.0%
MW-16	15.00-30.81	22.98	Within	79.2%
MW-17	15.00-29.91	22.55	Within	17.8%
MW-18	10.10-30.41	22.74	Within	72.7%
MW-19	11.80-27.45	18.91	Within	<1.0%
MW-20	12.00-27.00	8.73	Above	<1.0%
MW-23	16.10-37.45	27.34	Within	<1.0%
MW-26	8.50-30.45	13.05	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – October 19, 2023

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	23.82	Above	<1.0%
MW-4	21.50-30.10	27.40	Within	<1.0%
MW-14	16.20-36.20	26.09	Within	<1.0%
MW-15	11.30-26.65	19.48	Within	<1.0%
MW-16	15.00-30.81	26.13	Within	<1.0%
MW-17	15.00-29.91	23.93	Within	<1.0%
MW-18	10.10-30.41	24.49	Within	<1.0%
MW-19	11.80-27.45	26.95	Within	<1.0%
MW-20	12.00-27.00	22.52	Within	<1.0%
MW-23	16.10-37.45	31.90	Within	<1.0%
MW-26	8.50-30.45	18.82	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – May 29, 2024

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	14.10	Above	<1.0%
MW-4	21.50-30.10	26.58	Within	<1.0%
MW-14	16.20-36.20	23.99	Within	<1.0%
MW-15	11.30-26.65	13.38	Within	<1.0%
MW-16	15.00-30.81	22.79	Within	**17.0%**
MW-17	15.00-29.91	21.34	Within	<1.0%
MW-18	10.10-30.41	23.04	Within	**43.0%**
MW-19	11.80-27.45	22.75	Within	<1.0%
MW-20	12.00-27.00	9.57	Above	<1.0%
MW-23	16.10-37.45	32.06	Within	<1.0%
MW-26	8.50-30.45	11.15	Within	<1.0%

Cedar County Landfill Well & Gas Monitoring – October 11, 2024

Well	Screened Interval	Static Water Level	WL vs screen position	Methane reading (LEL)
MW-3A	16.40-36.40	20.04	Within	<1.0%
MW-4	21.50-30.10	27.29	Within	<1.0%
MW-14	16.20-36.20	25.34	Within	<1.0%
MW-15	11.30-26.65	17.04	Within	<1.0%
MW-16	15.00-30.81	24.91	Within	<1.0%
MW-17	15.00-29.91	22.74	Within	<1.0%
MW-18	10.10-30.41	24.07	Within	<1.0%
MW-19	11.80-27.45	26.78	Within	<1.0%
MW-20	12.00-27.00	16.56	Within	<1.0%
MW-23	16.10-37.45	33.14	Within	<1.0%
MW-26	8.50-30.45	15.35	Within	<1.0%