

November 28, 2023

Mr. Michael Smith, P.E., Environmental Engineer Senior
IDNR – Land Quality Bureau
Wallace State Office Building
502 East 9th Street
Des Moines, Iowa 50319-0034



**RE: LUCAS-MONROE SANITARY LANDFILL (68-SDP-1-75C)
2023 ANNUAL WATER QUALITY REPORT & LANDFILL GAS REPORT**

Dear Mr. Smith:

This letter forwards the results of water quality testing and explosive gas monitoring at the Lucas-Monroe Sanitary Landfill that were performed in accordance with Permit Amendment #14, dated January 12, 2018 (Doc #91256) and Permit Amendment #15, dated December 27, 2021 (Doc #101935).

Hydrologic Monitoring System Plan (HMSP)

- 1) On April 12, 2023 and October 6, 2023 each well listed in Permit Amendment #14 (Figure 1) was sampled. Each sample was analyzed for parameters listed in Permit Amendment #14 (Appendix I, IAC 567, Chapter 113, or the metals portion of Appendix I). The reported water quality data for this site is restricted to water samples collected by no-purge methods beginning October 1, 2015. Note that MW-7 was dry on October 6, 2023 and no sample was collected.
- 2) Water Elevation Measurements were collected at each well at the time of sample collection in accordance with Permit Amendment #14.
- 3) Explosive Gas was monitored in the well head space at each well, at each Gas Probe (GP-1, GP-2, and GP-3), and at Vents 1, 2, and 3 on April 12, 2023 and October 6, 2023 in accordance with Permit Amendment #15.
- 4) The results of the 2023 HMSP activities are reported below and this letter report represents the 2023 Annual Water Quality Report/2023 Landfill Gas Report.

Results of the HMSP Activities

Water Quality - A summary of detected compounds and the Keystone Analytical Reports for all 2023 sample analyses are included in Attachment A. The Field Sampling Forms for each 2023 sample collection event are included in Attachment B.

Ten (10) wells were historically sampled at this site (see Summary in Appendix A). Over the past six (6) years (2018 -2023) only MW-1R (background), MW-12 (background), and MW-7 are included in the sampling program.

VOC - Review of the data for 2023 indicates that a total of one (1) volatile organic compound (cis-1,2-dichloroethylene at MW-7) was detected. Review of the Summary of Appendix I Detections indicates that low-level VOC detections at MW-7 are below the Statewide Standard for Protected Groundwater included in IAC 567, Chapter 137, the groundwater protection standard (GWPS). MW-7 was recorded as dry on October 6, 2023.

Inorganics - Barium is the only compound that is consistently detected at all site monitoring wells. The remaining inorganic compounds are detected at a lower frequency and at far fewer wells.

The Statewide Standards for Protected Groundwater included in IAC 567, Chapter 137, are utilized as the groundwater protection standard (GWPS) for all inorganic compounds, except for cobalt. Cobalt is detected in the background wells, at times, at concentrations that exceed the Statewide Standard for Protected Groundwater. A site-specific GWPS for cobalt equal to the mean plus two (2) standard deviations (7.25 ug/L) for water quality in the background wells is utilized herein (see Appendix C for calculations). There are no non-parametric site-specific GWPS utilized herein in accordance with the IDNR letter dated January 12, 2018 (Doc #91255).

The 2015 -2023 results of required analyses at MW-7 indicate the following concentrations that exceed the applicable GWPS over time:

MW-7 - 10/1/2015 - arsenic (17.8 ug/L), exceeds the GWPS of 10.0 ug/L
 10/1/2015 - cobalt (11.1 ug/L), exceeds the Site-Specific GWPS of 7.54 ug/L
 10/7/2016 - arsenic (45.5 ug/L), exceeds the GWPS of 10.0 ug/L
 4/17/2017 - arsenic (29.6 ug/L), exceeds the GWPS of 10.0 ug/L
 10/2/2017 - arsenic (15.9 ug/L), exceeds the GWPS of 10.0 ug/L
 4/17/2018 - arsenic (25.1 ug/L), exceeds the GWPS of 10.0 ug/L
 10/11/2018 - arsenic (33.9 ug/L), exceeds the GWPS of 10.0 ug/L
 4/17/2019 - arsenic (18.7 ug/L), exceeds the GWPS of 10.0 ug/L
 4/17/2019 - cobalt (8.7 ug/L), exceeds the Site-Specific GWPS of 7.54 ug/L
 10/7/2019 - arsenic (27.8 ug/L), exceeds the GWPS of 10.0 ug/L
 4/14/2020 - arsenic (19.3 ug/L), exceeds the GWPS of 10.0 ug/L
 10/7/2020 - arsenic (38.9 ug/L), exceeds the GWPS of 10.0 ug/L
 10/7/2020 - cobalt (13.5 ug/L), exceeds the Site-Specific GWPS of 7.54 ug/L
 3/5/2021 - arsenic (21.6 ug/L), exceeds the GWPS of 10.0 ug/L
 9/22/2021 - arsenic (21.6 ug/L), exceeds the GWPS of 10.0 ug/L
 4/1/2022 - arsenic (15.4 ug/L), exceeds the GWPS of 10.0 ug/L
 10/3/2022 - cobalt (8.1 ug/L), exceeds the Site-Specific GWPS of 7.55 ug/L

Quality Assurance/Quality Control - A blind duplicate sample was collected at MW-1R during the April 12, 2023 sampling event and at MW-12 during the October 6, 2023 sampling episode.

The purpose of the field duplicate is to evaluate the precision of sample collection and analysis process from the field through the laboratory. The calculation of the Relative Percent Difference (RPD) for duplicate pair results is used as the means to evaluate the precision.

The Quality Control (QC) limit for the RPD on field duplicates is established at thirty percent (30%) for duplicate pairs that have reported concentrations five (5) times greater than the laboratory Reporting Limit. For samples and respective duplicates with reported analyte concentrations nearer the Reporting Limit, the RPD calculations demonstrate greater variability and the RPD can be very large. RPD values are considered non-representative in the following conditions:

- a) Both the original and/or the duplicate results are less than five (5) times the Reporting Limit.
- b) One or both results are qualified, flagged, or estimated.
- c) One or both results are non-detected.

The results of the blind duplicate and the monitoring well results were within the limits established and indicate that the data quality is acceptable without restriction based on the April 12, 2023 and October 6, 2023 quality control samples.

Water Elevation Measurements - Water elevation measurements were collected during sampling on April 12, 2023 and October 6, 2023 and are included in the Table in Attachment D. Review of the water elevation data for 2023 does not indicate excessive variability compared to historic water elevation data. The variability in water levels appears to be cyclic over time. A copy of the October 6, 2023 Water Table Contour Map (Figure 2) is included herein and illustrates groundwater flow paths across the site. The shape of the water table surface illustrated in the map is relatively unchanged from the previous year's map.

A Monitoring Well Maintenance Performance Reevaluation Plan (MWMPRP) was completed May 10, 2021 (Doc# 100452) in accordance with rules in effect at the time of closure (IAC 567, Chapter 103). The MWMPRP is due again in 2026.

Results of the GMSP Activities

Explosive Gas Monitoring from the Well Headspace and Gas Probes – Semi-annual explosive gas monitoring was performed at GP-1, GP-2, GP-3, and in the well headspace of all site monitoring wells on April 12, 2023 and October 6, 2023. The results of gas monitoring in 2023 are summarized in the Tables in Attachment E and includes an assessment of water elevation to the top of the monitoring well screens. Explosive gas concentrations (as %LEL) were not detected at any well or probe in 2023. The results of the monitoring indicate that gas concentrations monitored at each well head and each gas probe are below actionable levels.

Explosive Gas Monitoring from the Gas Collection/Vent Trench – A gas collection and venting trench was installed between the waste boundary and MW-7 during the Cap Improvement Project completed in October, 2021 (Doc # 101417). The three (3) vents along the vent trench are designated Vent 1 (North), Vent 2 (Middle), and Vent 3 (South). The three (3) vents are monitored on a semi-annual frequency to document performance of the vent trench. The results of gas monitoring from the vent trench are summarized in the Tables in Attachment E. The 2023 monitoring data indicate that explosive gas was detected in the vents on both April 12, 2023 and October 6, 2023. It is noted that while gas was detected in the vent trench, it was not detected at MW-7, located downgradient the trench.

Please feel free to contact our office at (515) 733-4144 with any questions you may have.

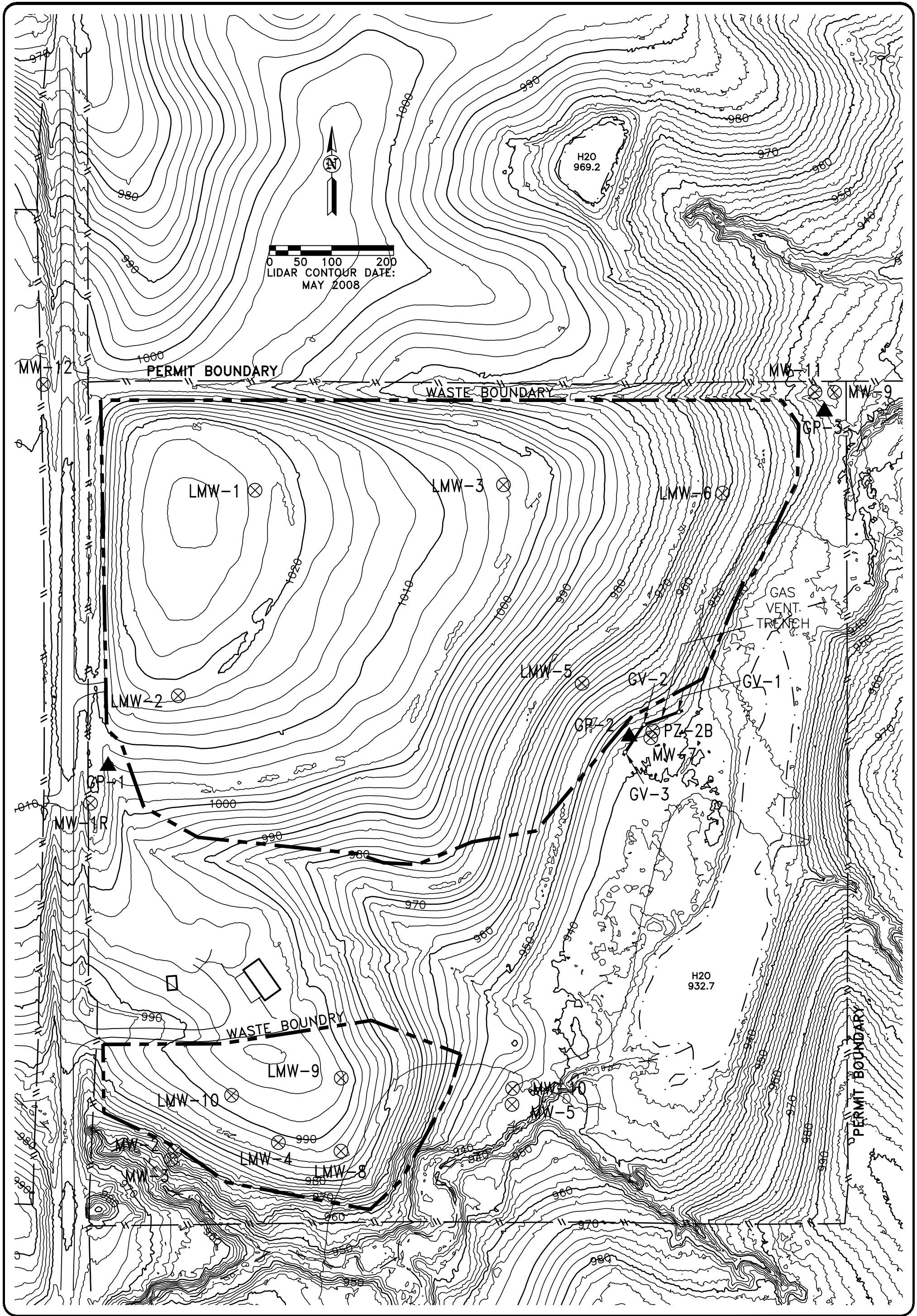
Conclusions Related to Permit Recission

The water quality and gas monitoring data reported herein support the interpretation that the facility has no significant impact on water quality or potential to generate off-site gas migration. The Proposed End to the Closure Permit (Doc #107047) is supported by the findings of this report. The City of Chariton is proceeding with Step 2 and 3 of the plan to End Regulation under IAC 567, Chapter 113, as required by the IDNR letter dated July 19, 2023 (Doc #107271).



cc: Laura Liegois, City Manager, Chariton, Iowa

HLW Engineering Group, 204 West Broad Street, P.O. Box 314, Story City, Iowa 50248
(515) 733-4144 ◇◇◇ (515) 733-4146 Fax



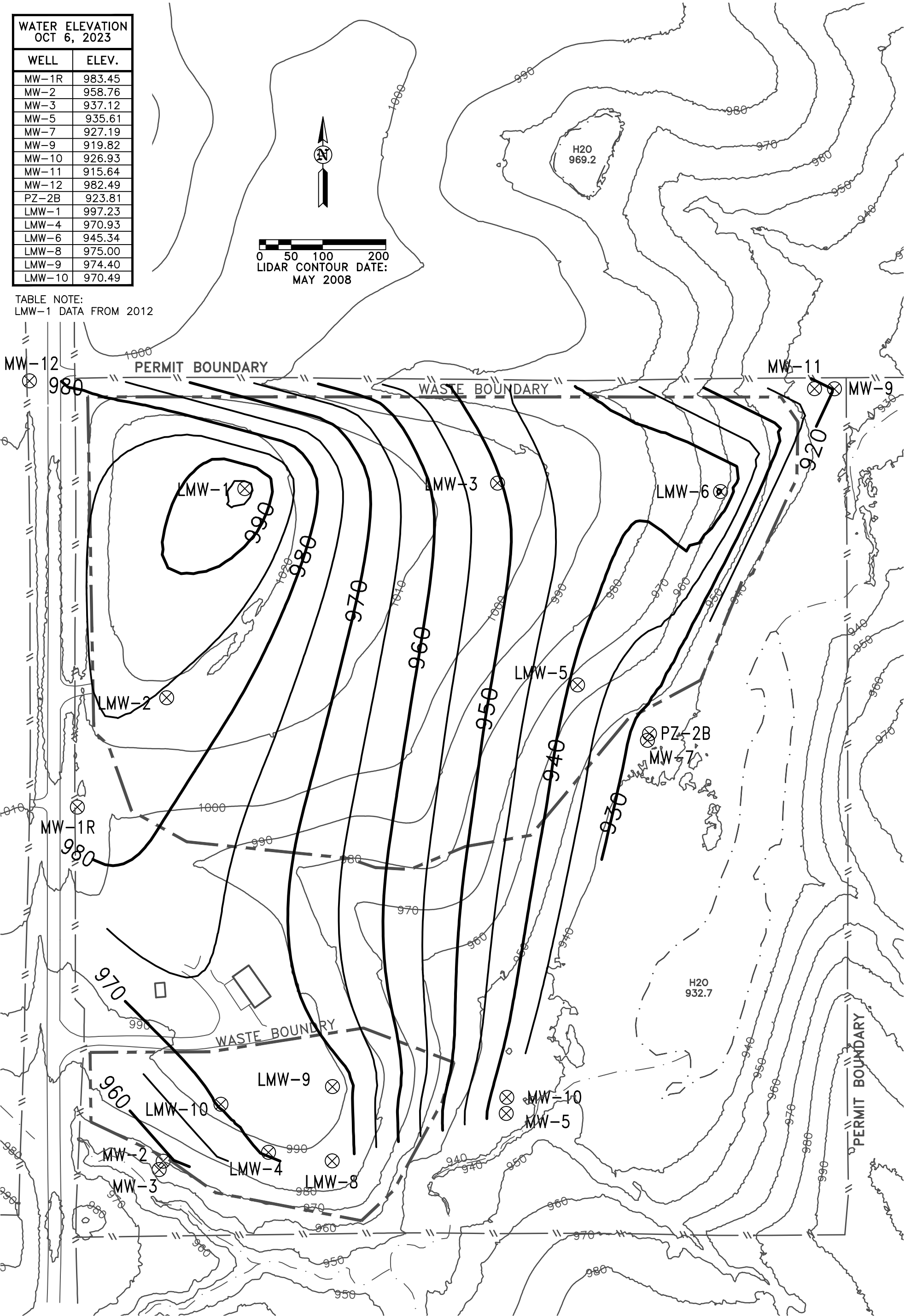
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204 West Broad Street, P.O. Box 314
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SITE PLAN
LUCAS-MONROE COUNTY SANITARY LANDFILL
CHARITON, IOWA

REVISION		NO.	DATE
DRAWN	DRA	PROJECT NO. 6010	DATE 10-9-23

WATER ELEVATION OCT 6, 2023	
WELL	ELEV.
MW-1R	983.45
MW-2	958.76
MW-3	937.12
MW-5	935.61
MW-7	927.19
MW-9	919.82
MW-10	926.93
MW-11	915.64
MW-12	982.49
PZ-2B	923.81
LMW-1	997.23
LMW-4	970.93
LMW-6	945.34
LMW-8	975.00
LMW-9	974.40
LMW-10	970.49

TABLE NOTE:
LMW-1 DATA FROM 2012



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GROUNDWATER CONTOURS

LUCAS-MONROE COUNTY SANITARY LANDFILL
CHARITON, IOWA

REVISION		NO.	DATE
DRAWN	DRA	PROJECT NO. 6010	DATE 10-9-23

ATTACHMENT A

Water Quality Results & Summary

HMSP Sampling & Testing Results
Lucas-Monroe Sanitary Landfill
Summary of Appendix I Detections

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	PZ-2b	MW-2	MW-3	MW-5	MW-7	MW-9	MW-10	MW-11
Turbidity (metals)	10/1/2015	N/A	N/A	NTU	5.65	1.08	1.18	Dry	2.06	Dry	1.42	2.1	20.2	1.22
Turbidity (metals)	4/21/2016	N/A	N/A	NTU	33.65	3.25	1.02	Dry	4.58	Dry	21.52	0.26	11.73	1.77
Turbidity (metals)	10/7/2016	N/A	N/A	NTU	9.41	35.5	3.13	Dry	8.27	Dry	2.53	1000	20	2.8
Turbidity (metals)	4/17/2017	N/A	N/A	NTU	111	2.62	NT	9.21	NT	NT	2.75	6.87	NT	NT
Turbidity (metals)	10/2/2017	N/A	N/A	NTU	1.24	1.29	NT	Dry	NT	NT	0.56	2.23	NT	NT
Turbidity (metals)	4/17/2018	N/A	N/A	NTU	4.09	159.0	NT	Dry	NT	NT	3.02	NT	NT	NT
Turbidity (metals)	10/11/2018	N/A	N/A	NTU	3.94	0.7	NT	NT	NT	NT	2.76	NT	NT	NT
Turbidity (metals)	4/17/2019	N/A	N/A	NTU	5.27	4.43	NT	NT	NT	NT	32.6	NT	NT	NT
Turbidity (metals)	10/7/2019	N/A	N/A	NTU	6.97	2.78	NT	NT	NT	NT	2.40	NT	NT	NT
Turbidity (metals)	4/14/2020	N/A	N/A	NTU	21.2	2.59	NT	NT	NT	NT	12.20	NT	NT	NT
Turbidity (metals)	10/7/2020	N/A	N/A	NTU	5.8	422	NT	NT	NT	NT	23.50	NT	NT	NT
Turbidity (metals)	3/5/2021	N/A	N/A	NTU	3.38	1.27	NT	NT	NT	NT	8.79	NT	NT	NT
Turbidity (metals)	9/22/2021	N/A	N/A	NTU	1.51	8.01	NT	NT	NT	NT	3.79	NT	NT	NT
Turbidity (metals)	4/1/2022	N/A	N/A	NTU	269.5	2.96	NT	NT	NT	NT	21.44	NT	NT	NT
Turbidity (metals)	10/3/2022	N/A	N/A	NTU	24.43	3.61	NT	NT	NT	NT	1.49	NT	NT	NT
Turbidity (metals)	4/12/2023	N/A	N/A	NTU	217	5.63	NT	NT	NT	NT	13.6	NT	NT	NT
Turbidity (metals)	10/6/2023	N/A	N/A	NTU	19.42	2.46	NT	NT	NT	NT	Dry	NT	NT	NT

HMSP Sampling & Testing Results
Lucas-Monroe Sanitary Landfill
Summary of Appendix I Detections

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	PZ-2b	MW-2	MW-3	MW-5	MW-7	MW-9	MW-10	MW-11
Acetone	10/1/2015	6,300	6,300	ug/L	<10	<10	<10	Dry	<10	Dry	<10	<10	<10	18.4
Acetone	4/21/2016	6,300	6,300	ug/L	<10	<10	<10	Dry	<10	Dry	<10	<10	<10	<10
Acetone	10/7/2016	6,300	6,300	ug/L	<10	<10	<10	Dry	<10	Dry	168	<10	<10	<10
Acetone	4/17/2017	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/2/2017	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	NR*	NT	NT	NT
Acetone	4/17/2018	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/11/2018	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	4/17/2019	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/7/2019	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	4/14/2020	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/7/2020	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	3/5/2021	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	9/22/2021	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	4/1/2022	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/3/2022	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	4/12/2023	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
Acetone	10/6/2023	6,300	6,300	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
Vinyl Chloride	10/1/2015	2	2	ug/L	<1	<1	<1	Dry	<1	Dry	1.0	<1	<1	<1
Vinyl Chloride	4/21/2016	2	2	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
Vinyl Chloride	10/7/2016	2	2	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
Vinyl Chloride	4/17/2017	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.9	NT	NT	NT
Vinyl Chloride	10/2/2017	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.0	NT	NT	NT
Vinyl Chloride	4/17/2018	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.2	NT	NT	NT
Vinyl Chloride	10/11/2018	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.5	NT	NT	NT
Vinyl Chloride	4/17/2019	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.0	NT	NT	NT
Vinyl Chloride	10/7/2019	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.7	NT	NT	NT
Vinyl Chloride	4/14/2020	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.5	NT	NT	NT
Vinyl Chloride	10/7/2020	2	2	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Vinyl Chloride	3/5/2021	2	2	ug/L	NT	NT	NT	NT	NT	NT	1.0	NT	NT	NT
Vinyl Chloride	9/22/2021	2	2	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Vinyl Chloride	4/1/2022	2	2	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Vinyl Chloride	10/3/2022	2	2	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Vinyl Chloride	4/12/2023	2	2	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Vinyl Chloride	10/6/2023	2	2	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
Chloroethane	10/1/2015	2,800	2,800	ug/L	<1	<1	<1	Dry	<1	Dry	1.6	<1	<1	<1
Chloroethane	4/21/2016	2,800	2,800	ug/L	<1	<1	<1	Dry	<1	Dry	1.3	<1	<1	<1
Chloroethane	10/7/2016	2,800	2,800	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
Chloroethane	4/17/2017	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.7	NT	NT	NT
Chloroethane	10/2/2017	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.4	NT	NT	NT
Chloroethane	4/17/2018	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.3	NT	NT	NT
Chloroethane	10/11/2018	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Chloroethane	4/17/2019	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.4	NT	NT	NT
Chloroethane	10/7/2019	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT
Chloroethane	4/14/2020	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT
Chloroethane	10/7/2020	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT
Chloroethane	3/5/2021	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.9	NT	NT	NT
Chloroethane	9/22/2021	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.6	NT	NT	NT
Chloroethane	4/1/2022	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	1.7	NT	NT	NT
Chloroethane	10/3/2022	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	2.4	NT	NT	NT
Chloroethane	4/12/2023	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Chloroethane	10/6/2023	2,800	2,800	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
1,1-DCA	10/1/2015	7	7	ug/L	<1	<1	<1	Dry	<1	Dry	1.3	<1	<1	<1
1,1-DCA	4/21/2016	7	7	ug/L	<1	<1	<1	Dry	<1	Dry	1.3	<1	<1	<1
1,1-DCA	10/7/2016	7	7	ug/L	<1	<1	<1	Dry	<1	Dry	2.0	<1	<1	<1
1,1-DCA	4/17/2017	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.3	NT	NT	NT
1,1-DCA	10/2/2017	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	4/17/2018	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.4	NT	NT	NT
1,1-DCA	10/11/2018	7	7	ug/L	NT	NT	NT	NT	NT	NT	2.4	NT	NT	NT
1,1-DCA	4/17/2019	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.2	NT	NT	NT
1,1-DCA	10/7/2019	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	4/14/2020	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.5	NT	NT	NT
1,1-DCA	10/7/2020	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.5	NT	NT	NT
1,1-DCA	3/5/2021	7	7	ug/L	NT	NT	NT	NT	NT	NT	1.1	NT	NT	NT
1,1-DCA	9/22/2021	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	4/1/2022	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	10/3/2022	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	4/12/2023	7	7	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,1-DCA	10/6/2023	7	7	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
cis-1,2-DCE	10/1/2015	70	70	ug/L	<1	<1	<1	Dry	<1	Dry	5.1	<1	<1	<1
cis-1,2-DCE	4/21/2016	70	70	ug/L	<1	<1	<1	Dry	<1	Dry	5.2	<1	<1	<1
cis-1,2-DCE	10/7/2016	70	70	ug/L	<1	<1	<1	Dry	<1	Dry	6.2	<1	<1	<1
cis-1,2-DCE	4/17/2017	70	70	ug/L	NT	NT	NT	NT	NT	NT	7.9	NT	NT	NT
cis-1,2-DCE	10/2/2017	70	70	ug/L	NT	NT	NT	NT	NT	NT	7.4	NT	NT	NT
cis-1,2-DCE	4/17/2018	70	70	ug/L	NT	NT	NT	NT	NT	NT	8.9	NT	NT	NT
cis-1,2-DCE	10/11/2018	70	70	ug/L	NT	NT	NT	NT	NT	NT	9.3	NT	NT	NT
cis-1,2-DCE	4/17/2019	70	70	ug/L	NT	NT	NT	NT	NT	NT	6.7	NT	NT	NT
cis-1,2-DCE	10/7/2019	70	70	ug/L	NT	NT	NT	NT	NT	NT	5.1	NT	NT	NT
cis-1,2-DCE	4/14/2020	70	70	ug/L	NT	NT	NT	NT	NT	NT	6.4	NT	NT	NT
cis-1,2-DCE	10/7/2020	70	70	ug/L	NT	NT	NT	NT	NT	NT	8.2	NT	NT	NT
cis-1,2-DCE	3/5/2021	70	70	ug/L	NT	NT	NT	NT	NT	NT	2.2	NT	NT	NT
cis-1,2-DCE	9/22/2021	70	70	ug/L	NT	NT	NT	NT	NT	NT	3.9	NT	NT	NT
cis-1,2-DCE	4/1/2022	70	70	ug/L	NT	NT	NT	NT	NT	NT	3.3	NT	NT	NT
cis-1,2-DCE	10/3/2022	70	70	ug/L	NT	NT	NT	NT	NT	NT	5.6	NT	NT	NT
cis-1,2-DCE	4/12/2023	70	70	ug/L	NT	NT	NT	NT	NT	NT	2.1	NT	NT	NT
cis-1,2-DCE	10/6/2023	70	70	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT

HMSP Sampling & Testing Results
Lucas-Monroe Sanitary Landfill
Summary of Appendix I Detections

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	PZ-2b	MW-2	MW-3	MW-5	MW-7	MW-9	MW-10	MW-11
2-Butanone	10/1/2015	4,000	4,000	ug/L	<5	<5	<5	Dry	<5	Dry	<5	<5	<5	<5
2-Butanone	4/21/2016	4,000	4,000	ug/L	<5	<5	<5	Dry	<5	Dry	<5	<5	<5	<5
2-Butanone	10/7/2016	4,000	4,000	ug/L	<5	<5	<5	Dry	<5	Dry	34.3	<5	<5	<5
2-Butanone	4/17/2017	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	10/2/2017	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	4/17/2018	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	10/11/2018	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	4/17/2019	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	10/7/2019	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	4/14/2020	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	10/7/2020	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	3/5/2021	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	9/22/2021	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<5	NT	NT	NT
2-Butanone	4/1/2022	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
2-Butanone	10/3/2022	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
2-Butanone	4/12/2023	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	<10	NT	NT	NT
2-Butanone	10/6/2023	4,000	4,000	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
Benzene	10/1/2015	5	5	ug/L	<1	<1	<1	Dry	<1	Dry	1.4	<1	<1	<1
Benzene	4/21/2016	5	5	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
Benzene	10/7/2016	5	5	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
Benzene	4/17/2017	5	5	ug/L	NT	NT	NT	NT	NT	NT	2.0	NT	NT	NT
Benzene	10/2/2017	5	5	ug/L	NT	NT	NT	NT	NT	NT	1.8	NT	NT	NT
Benzene	4/17/2018	5	5	ug/L	NT	NT	NT	NT	NT	NT	2.8	NT	NT	NT
Benzene	10/11/2018	5	5	ug/L	NT	NT	NT	NT	NT	NT	4.2	NT	NT	NT
Benzene	4/17/2019	5	5	ug/L	NT	NT	NT	NT	NT	NT	2.0	NT	NT	NT
Benzene	10/7/2019	5	5	ug/L	NT	NT	NT	NT	NT	NT	2.7	NT	NT	NT
Benzene	4/14/2020	5	5	ug/L	NT	NT	NT	NT	NT	NT	3.0	NT	NT	NT
Benzene	10/7/2020	5	5	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Benzene	3/5/2021	5	5	ug/L	NT	NT	NT	NT	NT	NT	3.3	NT	NT	NT
Benzene	9/22/2021	5	5	ug/L	NT	NT	NT	NT	NT	NT	1.4	NT	NT	NT
Benzene	4/1/2022	5	5	ug/L	NT	NT	NT	NT	NT	NT	1.5	NT	NT	NT
Benzene	10/3/2022	5	5	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Benzene	4/12/2023	5	5	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
Benzene	10/6/2023	5	5	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT
1,4-Dichlorobenzene	10/1/2015	75	75	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
1,4-Dichlorobenzene	4/21/2016	75	75	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
1,4-Dichlorobenzene	10/7/2016	75	75	ug/L	<1	<1	<1	Dry	<1	Dry	<1	<1	<1	<1
1,4-Dichlorobenzene	4/17/2017	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	10/2/2017	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	4/17/2018	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	10/11/2018	75	75	ug/L	NT	NT	NT	NT	NT	NT	1.7	NT	NT	NT
1,4-Dichlorobenzene	4/17/2019	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	10/7/2019	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	4/14/2020	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	10/7/2020	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	3/5/2021	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	9/22/2021	75	75	ug/L	NT	NT	NT	NT	NT	NT	1.0	NT	NT	NT
1,4-Dichlorobenzene	4/1/2022	75	75	ug/L	NT	NT	NT	NT	NT	NT	2.0	NT	NT	NT
1,4-Dichlorobenzene	10/3/2022	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	4/12/2023	75	75	ug/L	NT	NT	NT	NT	NT	NT	<1	NT	NT	NT
1,4-Dichlorobenzene	10/6/2023	75	75	ug/L	NT	NT	NT	NT	NT	NT	Dry	NT	NT	NT

HMSP Sampling & Testing Results Lucas-Monroe Sanitary Landfill Summary of Appendix I Detections														
Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	PZ-2b	MW-2	MW-3	MW-5	MW-7	MW-9	MW-10	MW-11
Arsenic, total	10/1/2015	0.01	0.01	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	0.0178	<0.004	<0.004	<0.004
Arsenic, total	4/21/2016	0.01	0.01	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	0.0053	<0.004	<0.004	<0.004
Arsenic, total	10/7/2016	0.01	0.01	mg/L	<0.004	0.0111	<0.004	Dry	<0.004	Dry	0.0455	<0.004	<0.004	<0.004
Arsenic, total	4/17/2017	0.01	0.01	mg/L	<0.004	<0.004	NT	<0.004	NT	NT	0.0296	<0.004	NT	NT
Arsenic, total	10/2/2017	0.01	0.01	mg/L	<0.004	<0.004	NT	Dry	NT	NT	0.0159	<0.004	NT	NT
Arsenic, total	4/17/2018	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0251	NT	NT	NT
Arsenic, total	10/11/2018	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0339	NT	NT	NT
Arsenic, total	4/17/2019	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0187	NT	NT	NT
Arsenic, total	10/7/2019	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0278	NT	NT	NT
Arsenic, total	4/14/2020	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0193	NT	NT	NT
Arsenic, total	10/7/2020	0.01	0.01	mg/L	<0.004	0.0066	NT	NT	NT	NT	0.0389	NT	NT	NT
Arsenic, total	3/5/2021	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0216	NT	NT	NT
Arsenic, total	9/22/2021	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0216	NT	NT	NT
Arsenic, total	4/1/2022	0.01	0.01	mg/L	0.0064	<0.004	NT	NT	NT	NT	0.0154	NT	NT	NT
Arsenic, total	10/3/2022	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.008	NT	NT	NT
Arsenic, total	4/12/2023	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Arsenic, total	10/6/2023	0.01	0.01	mg/L	<0.004	<0.004	NT	NT	NT	NT	Dry	NT	NT	NT
Barium, total	10/1/2015	2	2	mg/L	0.0239	0.17	0.0179	Dry	0.0253	Dry	0.256	0.124	0.131	0.0427
Barium, total	4/21/2016	2	2	mg/L	0.0197	0.164	0.0197	Dry	0.241	Dry	0.198	0.0956	0.114	0.0408
Barium, total	10/7/2016	2	2	mg/L	0.0191	0.257	0.0186	Dry	0.0226	Dry	0.241	0.346	0.0474	0.0443
Barium, total	4/17/2017	2	2	mg/L	0.0199	0.153	NT	0.126	NT	NT	0.353	0.0797	NT	NT
Barium, total	10/2/2017	2	2	mg/L	0.0176	0.196	NT	Dry	NT	NT	0.227	0.110	NT	NT
Barium, total	4/17/2018	2	2	mg/L	0.0275	0.299	NT	NT	NT	NT	0.451	NT	NT	NT
Barium, total	10/11/2018	2	2	mg/L	0.0227	0.163	NT	NT	NT	NT	0.395	NT	NT	NT
Barium, total	4/17/2019	2	2	mg/L	0.0339	0.153	NT	NT	NT	NT	0.454	NT	NT	NT
Barium, total	10/7/2019	2	2	mg/L	0.0247	0.234	NT	NT	NT	NT	0.368	NT	NT	NT
Barium, total	4/14/2020	2	2	mg/L	0.0323	0.182	NT	NT	NT	NT	0.501	NT	NT	NT
Barium, total	10/7/2020	2	2	mg/L	0.0321	0.242	NT	NT	NT	NT	0.486	NT	NT	NT
Barium, total	3/5/2021	2	2	mg/L	0.0210	0.114	NT	NT	NT	NT	0.498	NT	NT	NT
Barium, total	9/22/2021	2	2	mg/L	0.0138	0.231	NT	NT	NT	NT	0.394	NT	NT	NT
Barium, total	4/1/2022	2	2	mg/L	0.0788	0.200	NT	NT	NT	NT	0.459	NT	NT	NT
Barium, total	10/3/2022	2	2	mg/L	0.0249	0.184	NT	NT	NT	NT	0.311	NT	NT	NT
Barium, total	4/12/2023	2	2	mg/L	0.0294	0.123	NT	NT	NT	NT	0.320	NT	NT	NT
Barium, total	10/6/2023	2	2	mg/L	0.0147	0.144	NT	NT	NT	NT	Dry	NT	NT	NT
Cadmium, total	10/1/2015	0.005	0.005	mg/L	<0.0008	<0.0008	<0.0008	Dry	<0.0008	Dry	<0.0008	<0.0008	<0.0008	<0.0008
Cadmium, total	4/21/2016	0.005	0.005	mg/L	<0.0008	<0.0008	<0.0008	Dry	<0.0008	Dry	<0.0008	<0.0008	<0.0008	0.0008
Cadmium, total	10/7/2016	0.005	0.005	mg/L	<0.0008	<0.0008	<0.0008	Dry	<0.0008	Dry	0.0011	0.008	<0.0008	<0.0008
Cadmium, total	4/17/2017	0.005	0.005	mg/L	<0.0008	<0.0008	NT	<0.0008	NT	NT	<0.0008	<0.0008	NT	NT
Cadmium, total	10/2/2017	0.005	0.005	mg/L	<0.0008	<0.0008	NT	Dry	NT	NT	<0.0008	<0.0008	NT	NT
Cadmium, total	4/17/2018	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	10/11/2018	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	4/17/2019	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	10/7/2019	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	4/14/2020	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	0.0013	NT	NT	NT
Cadmium, total	10/7/2020	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	3/5/2021	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	9/22/2021	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	4/1/2022	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	10/3/2022	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	4/12/2023	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	<0.0008	NT	NT	NT
Cadmium, total	10/6/2023	0.005	0.005	mg/L	<0.0008	<0.0008	NT	NT	NT	NT	Dry	NT	NT	NT
Cobalt, total	10/1/2015	0.0028	0.00725	mg/L	<0.0008	<0.0008	<0.0008	Dry	0.0008	Dry	0.0111	<0.0008	<0.0008	0.0009
Cobalt, total	4/21/2016	0.0028	0.00725	mg/L	0.0010	<0.0008	<0.0008	Dry	<0.0008	Dry	0.0072	<0.0008	<0.0008	<0.0008
Cobalt, total	10/7/2016	0.0028	0.00725	mg/L	<0.0008	0.0116	<0.0008	Dry	<0.0008	Dry	0.0077	0.0077	<0.0008	0.0010
Cobalt, total	4/17/2017	0.0028	0.00725	mg/L	<0.0008	<0.0008	NT	0.0046	NT	NT	0.0078	<0.0008	NT	NT
Cobalt, total	10/2/2017	0.0028	0.00725	mg/L	0.0011	<0.0008	NT	Dry	NT	NT	0.0078	<0.0008	NT	NT
Cobalt, total	4/17/2018	0.0021	0.00725	mg/L	0.0034	0.0035	NT	NT	NT	NT	0.0065	NT	NT	NT
Cobalt, total	10/11/2018	0.0021	0.00725	mg/L	0.0027	<0.0008	NT	NT	NT	NT	0.0016	NT	NT	NT
Cobalt, total	4/17/2019	0.0021	0.00725	mg/L	0.0072	<0.0008	NT	NT	NT	NT	0.0087	NT	NT	NT
Cobalt, total	10/7/2019	0.0021	0.00725	mg/L	0.0021	<0.0008	NT	NT	NT	NT	0.0025	NT	NT	NT
Cobalt, total	4/14/2020	0.0021	0.00725	mg/L	0.0021	<0.0004	NT	NT	NT	NT	0.0068	NT	NT	NT
Cobalt, total	10/7/2020	0.0021	0.00725	mg/L	<0.0004	0.0083	NT	NT	NT	NT	0.0135	NT	NT	NT
Cobalt, total	3/5/2021	0.0021	0.00725	mg/L	0.0012	<0.0004	NT	NT	NT	NT	0.0033	NT	NT	NT
Cobalt, total	9/22/2021	0.0021	0.00725	mg/L	<0.0004	<0.0004	NT	NT	NT	NT	0.0055	NT	NT	NT
Cobalt, total	4/1/2022	0.0021	0.00725	mg/L	0.0061	<0.0004	NT	NT	NT	NT	0.0055	NT	NT	NT
Cobalt, total	10/3/2022	0.0021	0.00725	mg/L	0.0031	0.0021	NT	NT	NT	NT	0.0081	NT	NT	NT
Cobalt, total	4/12/2023	0.0021	0.00725	mg/L	0.0018	<0.0004	NT	NT	NT	NT	0.0046	NT	NT	NT
Cobalt, total	10/6/2023	0.0021	0.00725	mg/L	0.0005	<0.0004	NT	NT	NT	NT	Dry	NT	NT	NT
Chromium, total	10/1/2015	0.1	0.1	mg/L	<0.008	<0.008	<0.008	Dry	<0.008	Dry	<0.008	<0.008	<0.008	<0.008
Chromium, total	4/21/2016	0.1	0.1	mg/L	<0.008	<0.008	<0.008	Dry	<0.008	Dry	<0.008	<0.008	<0.008	<0.008
Chromium, total	10/7/2016	0.1	0.1	mg/L	<0.008	0.0183	<0.008	Dry	<0.008	Dry	<0.008	0.0169	<0.008	<0.008
Chromium, total	4/17/2017	0.1	0.1	mg/L	<0.008	<0.008	NT	<0.008	NT	NT	<0.008	<0.008	NT	NT
Chromium, total	10/2/2017	0.1	0.1	mg/L	<0.008	<0.008	NT	Dry	NT	NT	<0.008	<0.008	NT	NT
Chromium, total	4/17/2018	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	10/11/2018	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	4/17/2019	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	10/7/2019	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	4/14/2020	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	10/7/2020	0.1	0.1	mg/L	<0.008	0.0138	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	3/5/2021	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	9/22/2021	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	4/1/2022	0.1	0.1	mg/L	0.0186	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	10/3/2022	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	4/12/2023	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	<0.008	NT	NT	NT
Chromium, total	10/6/2023	0.1	0.1	mg/L	<0.008	<0.008	NT	NT	NT	NT	Dry	NT	NT	NT

HMSP Sampling & Testing Results
Lucas-Monroe Sanitary Landfill
Summary of Appendix I Detections

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	PZ-2b	MW-2	MW-3	MW-5	MW-7	MW-9	MW-10	MW-11
Copper, total	10/1/2015	1.3	1.3	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	<0.004	<0.004	<0.004	<0.004
Copper, total	4/21/2016	1.3	1.3	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	<0.004	<0.004	<0.004	<0.004
Copper, total	10/7/2016	1.3	1.3	mg/L	<0.004	0.0170	<0.004	Dry	<0.004	Dry	0.0146	0.0399	<0.004	<0.004
Copper, total	4/17/2017	1.3	1.3	mg/L	<0.004	<0.004	NT	<0.004	NT	NT	<0.004	0.0063	NT	NT
Copper, total	10/2/2017	1.3	1.3	mg/L	<0.004	<0.004	NT	Dry	NT	NT	<0.004	0.0073	NT	NT
Copper, total	4/17/2018	1.3	1.3	mg/L	<0.004	0.0054	NT	NT	NT	NT	0.0062	NT	NT	NT
Copper, total	10/11/2018	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	4/17/2019	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	10/7/2019	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	4/14/2020	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	10/7/2020	1.3	1.3	mg/L	<0.004	0.0135	NT	NT	NT	NT	0.012	NT	NT	NT
Copper, total	3/5/2021	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	9/22/2021	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0041	NT	NT	NT
Copper, total	4/1/2022	1.3	1.3	mg/L	0.0129	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	10/3/2022	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0041	NT	NT	NT
Copper, total	4/12/2023	1.3	1.3	mg/L	0.0074	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Copper, total	10/6/2023	1.3	1.3	mg/L	<0.004	<0.004	NT	NT	NT	NT	Dry	NT	NT	NT
Nickel, total	10/1/2015	0.1	0.1	mg/L	0.0066	0.0052	0.0051	Dry	0.0045	Dry	0.012	0.0094	<0.004	0.009
Nickel, total	4/21/2016	0.1	0.1	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	0.0110	<0.004	<0.004	0.0217
Nickel, total	10/7/2016	0.1	0.1	mg/L	<0.004	0.0258	<0.004	Dry	<0.004	Dry	0.0155	0.0538	<0.004	<0.004
Nickel, total	4/17/2017	0.1	0.1	mg/L	<0.004	<0.004	NT	0.0247	NT	NT	0.0041	0.0041	NT	NT
Nickel, total	10/2/2017	0.1	0.1	mg/L	<0.004	<0.004	NT	Dry	NT	NT	0.0061	0.0071	NT	NT
Nickel, total	4/17/2018	0.1	0.1	mg/L	<0.004	0.0075	NT	NT	NT	NT	<0.004	NT	NT	NT
Nickel, total	10/11/2018	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Nickel, total	4/17/2019	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0069	NT	NT	NT
Nickel, total	10/7/2019	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Nickel, total	4/14/2020	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0061	NT	NT	NT
Nickel, total	10/7/2020	0.1	0.1	mg/L	<0.004	0.0174	NT	NT	NT	NT	0.0306	NT	NT	NT
Nickel, total	3/5/2021	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Nickel, total	9/22/2021	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0105	NT	NT	NT
Nickel, total	4/1/2022	0.1	0.1	mg/L	0.0179	<0.004	NT	NT	NT	NT	0.0092	NT	NT	NT
Nickel, total	10/3/2022	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	0.0143	NT	NT	NT
Nickel, total	4/12/2023	0.1	0.1	mg/L	0.006	<0.004	NT	NT	NT	NT	0.0128	NT	NT	NT
Nickel, total	10/6/2023	0.1	0.1	mg/L	<0.004	<0.004	NT	NT	NT	NT	Dry	NT	NT	NT
Lead, total	10/1/2015	0.015	0.015	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	<0.004	<0.004	<0.004	<0.004
Lead, total	4/21/2016	0.015	0.015	mg/L	<0.004	<0.004	<0.004	Dry	<0.004	Dry	<0.004	<0.004	<0.004	<0.004
Lead, total	10/7/2016	0.015	0.015	mg/L	<0.004	0.0106	<0.004	Dry	<0.004	Dry	<0.004	0.0123	<0.004	<0.004
Lead, total	4/17/2017	0.015	0.015	mg/L	<0.004	<0.004	NT	<0.004	NT	NT	<0.004	<0.004	NT	NT
Lead, total	10/2/2017	0.015	0.015	mg/L	<0.004	<0.004	NT	Dry	NT	NT	<0.004	<0.004	NT	NT
Lead, total	4/17/2018	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	10/11/2018	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	4/17/2019	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	10/7/2019	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	4/14/2020	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	10/7/2020	0.015	0.015	mg/L	<0.004	0.0081	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	3/5/2021	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	9/22/2021	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	4/1/2022	0.015	0.015	mg/L	0.0076	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	10/3/2022	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	4/12/2023	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	<0.004	NT	NT	NT
Lead, total	10/6/2023	0.015	0.015	mg/L	<0.004	<0.004	NT	NT	NT	NT	Dry	NT	NT	NT
Vanadium, total	10/1/2015	0.035	0.035	mg/L	<0.02	<0.02	<0.02	Dry	<0.02	Dry	<0.02	<0.02	<0.02	<0.02
Vanadium, total	4/21/2016	0.035	0.035	mg/L	<0.02	<0.02	<0.02	Dry	<0.02	Dry	<0.02	<0.02	<0.02	<0.02
Vanadium, total	10/7/2016	0.035	0.035	mg/L	<0.02	0.0312	<0.02	Dry	<0.02	Dry	<0.02	0.0301	<0.02	<0.02
Vanadium, total	4/17/2017	0.035	0.035	mg/L	<0.02	<0.02	NT	<0.02	NT	NT	<0.02	<0.02	NT	NT
Vanadium, total	10/2/2017	0.035	0.035	mg/L	<0.02	<0.02	NT	Dry	NT	NT	<0.02	<0.02	NT	NT
Vanadium, total	4/17/2018	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	10/11/2018	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	4/17/2019	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	10/7/2019	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	4/14/2020	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	10/7/2020	0.035	0.035	mg/L	<0.02	0.0239	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	3/5/2021	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	9/22/2021	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	4/1/2022	0.035	0.035	mg/L	0.0264	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	10/3/2022	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	4/12/2023	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Vanadium, total	10/6/2023	0.035	0.035	mg/L	<0.02	<0.02	NT	NT	NT	NT	Dry	NT	NT	NT
Zinc, total	10/1/2015	2	2	mg/L	<0.02	<0.02	0.008	Dry	<0.02	Dry	<0.02	<0.02	<0.02	<0.02
Zinc, total	4/21/2016	2	2	mg/L	<0.02	<0.02	<0.02	Dry	<0.02	Dry	<0.02	<0.02	<0.02	<0.02
Zinc, total	10/7/2016	2	2	mg/L	<0.02	0.0525	0.0209	Dry	<0.02	Dry	0.112	0.0567	<0.02	<0.02
Zinc, total	4/17/2017	2	2	mg/L	<0.008	<0.008	NT	0.0113	NT	NT	<0.008	<0.02	NT	NT
Zinc, total	10/2/2017	2	2	mg/L	<0.008	<0.008	NT	Dry	NT	NT	0.0087	<0.008	NT	NT
Zinc, total	4/17/2018	2	2	mg/L	<0.008	0.0166	NT	NT	NT	NT	0.0092	NT	NT	NT
Zinc, total	10/11/2018	2	2	mg/L	0.0205	0.022	NT	NT	NT	NT	0.0308	NT	NT	NT
Zinc, total	4/17/2019	2	2	mg/L	0.0181	0.0089	NT	NT	NT	NT	0.0280	NT	NT	NT
Zinc, total	10/7/2019	2	2	mg/L	0.0251	0.0153	NT	NT	NT	NT	0.0514	NT	NT	NT
Zinc, total	4/14/2020	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	10/7/2020	2	2	mg/L	<0.02	0.0406	NT	NT	NT	NT	0.0817	NT	NT	NT
Zinc, total	3/5/2021	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	9/22/2021	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	4/1/2022	2	2	mg/L	0.0411	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	10/3/2022	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	4/12/2023	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	<0.02	NT	NT	NT
Zinc, total	10/6/2023	2	2	mg/L	<0.02	<0.02	NT	NT	NT	NT	Dry	NT	NT	NT

= applicable GWPS

= value exceeds the applicable GWPS

NT = Not Tested

NR* = acetone contamination detected in the trip blank vial. Acetone result is ignored.

ANALYTICAL REPORT

May 01, 2023

Work Order: 1GD1403

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

Work Order Information
Date Received: 4/13/2023 9:56:00AM Collector: JGH Phone: (515) 733-4144 PO Number:

Project: Lucas-Monroe SLF-New Regs

Project Number: 6010

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1GD1403-01	MW-1R			Matrix: Water		Collected: 04/12/23 09:05	
Silver, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Arsenic, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Barium, total	0.0294 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Beryllium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Cadmium, total	<0.0008 mg/L	0.0008	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Cobalt, total	0.0018 mg/L	0.0004	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Chromium, total	<0.0080 mg/L	0.0080	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Copper, total	0.0074 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Lead, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Antimony, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Selenium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Thallium, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Vanadium, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
Zinc, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 16:35	
1GD1403-01RE1	MW-1R			Matrix: Water		Collected: 04/12/23 09:05	
Nickel, total	0.0060 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/27/23 15:47	
1GD1403-02	MW-12			Matrix: Water		Collected: 04/12/23 08:50	
Silver, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Arsenic, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Barium, total	0.123 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Beryllium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Cadmium, total	<0.0008 mg/L	0.0008	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Cobalt, total	<0.0004 mg/L	0.0004	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Chromium, total	<0.0080 mg/L	0.0080	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Copper, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Nickel, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Lead, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

HLW Engineering
PO Box 314
Story City, IA 50248

May 01, 2023
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Work Order: 1GD1403

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1GD1403-02	MW-12			Matrix: Water		Collected: 04/12/23 08:50	
Antimony, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Selenium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Thallium, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Vanadium, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
Zinc, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 17:12	
1GD1403-03	MW-7			Matrix: Water		Collected: 04/12/23 09:31	
Acrylonitrile	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Surrogate: Dibromofluoromethane	121 %			80-126	LNH	04/15/23 8:20	
Surrogate: 1,2-Dichloroethane-d4	99.5 %			63-138	LNH	04/15/23 8:20	
Surrogate: Toluene-d8	97.4 %			87-116	LNH	04/15/23 8:20	
Surrogate: 4-Bromofluorobenzene	97.5 %			85-111	LNH	04/15/23 8:20	
Chloromethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Vinyl Chloride	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Bromomethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Chloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Trichlorofluoromethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1-Dichloroethylene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Acetone	<10.0 ug/L	10.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Methyl Iodide	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Carbon Disulfide	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Methylene Chloride	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
trans-1,2-Dichloroethylene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1-Dichloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Vinyl Acetate	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
cis-1,2-Dichloroethylene	2.1 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
2-Butanone (MEK)	<10.0 ug/L	10.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Bromochloromethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Chloroform	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1,1-Trichloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Carbon Tetrachloride	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Benzene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2-Dichloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Trichloroethylene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2-Dichloropropane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Dibromomethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Bromodichloromethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
cis-1,3-Dichloropropene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	

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PO Box 314
Story City, IA 50248

May 01, 2023
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Work Order: 1GD1403

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1GD1403-03	MW-7			Matrix: Water		Collected: 04/12/23 09:31	
4-Methyl-2-pentanone (MIBK)	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Toluene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
trans-1,3-Dichloropropene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1,2-Trichloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Tetrachloroethylene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
2-Hexanone (MBK)	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Dibromochloromethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2-Dibromoethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Chlorobenzene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1,1,2-Tetrachloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Ethylbenzene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Xylenes, total	<2.0 ug/L	2.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Styrene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Bromoform	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2,3-Trichloropropane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
trans-1,4-Dichloro-2-butene	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,1,2,2-Tetrachloroethane	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,4-Dichlorobenzene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2-Dichlorobenzene	<1.0 ug/L	1.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
1,2-Dibromo-3-chloropropane	<5.0 ug/L	5.0	1GD0867	EPA 8260B	LNH	04/15/23 8:20	
Surrogate: Dibromofluoromethane	121 %			75-136	LNH	04/15/23 8:20	
Surrogate: 1,2-Dichloroethane-d4	99.5 %			61-142	LNH	04/15/23 8:20	
Surrogate: Toluene-d8	97.4 %			82-121	LNH	04/15/23 8:20	
Surrogate: 4-Bromofluorobenzene	97.5 %			80-116	LNH	04/15/23 8:20	
Silver, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Arsenic, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Barium, total	0.320 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Beryllium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Cadmium, total	<0.0008 mg/L	0.0008	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Cobalt, total	0.0046 mg/L	0.0004	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Chromium, total	<0.0080 mg/L	0.0080	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Copper, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Nickel, total	0.0128 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Lead, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Antimony, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Selenium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Thallium, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
Vanadium, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 17:18	

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Work Order: 1GD1403

Analyte	Result	MRL	Batch	Method	Analyst	Analyzed	Qualifier
1GD1403-03	MW-7			Matrix: Water		Collected: 04/12/23 09:31	
Zinc, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/24/23 17:18	
1GD1403-04	Duplicate			Matrix: Water		Collected: 04/12/23 09:05	
Silver, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Arsenic, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Barium, total	0.0279 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Beryllium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Cadmium, total	<0.0008 mg/L	0.0008	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Cobalt, total	0.0017 mg/L	0.0004	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Chromium, total	<0.0080 mg/L	0.0080	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Copper, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Lead, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Antimony, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Selenium, total	<0.0040 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Thallium, total	<0.0020 mg/L	0.0020	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Vanadium, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
Zinc, total	<0.0200 mg/L	0.0200	1GD1060	EPA 6020A	RVV	04/25/23 11:11	
1GD1403-04RE1	Duplicate			Matrix: Water		Collected: 04/12/23 09:05	
Nickel, total	0.0054 mg/L	0.0040	1GD1060	EPA 6020A	RVV	04/27/23 15:53	

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Work Order: 1GD1403

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Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD0867 - EPA 5030B

Blank (1GD0867-BLK1)

Prepared: 04/14/23 Analyzed: 04/15/23

Surrogate: Dibromofluoromethane	55.7		ug/L	50.3520		111	80-126			
Surrogate: Dibromofluoromethane	55.7		"	50.3520		111	75-136			
Surrogate: 1,2-Dichloroethane-d4	49.9		"	50.4080		99.0	63-138			
Surrogate: 1,2-Dichloroethane-d4	49.9		"	50.4080		99.0	61-142			
Surrogate: Toluene-d8	49.1		"	50.2360		97.8	87-116			
Surrogate: Toluene-d8	49.1		"	50.2360		97.8	82-121			
Surrogate: 4-Bromofluorobenzene	50.0		"	50.4200		99.2	80-116			
Surrogate: 4-Bromofluorobenzene	50.0		"	50.4200		99.2	85-111			
Chloromethane	ND	1.0	"							
Vinyl Chloride	ND	1.0	"							
Bromomethane	ND	1.0	"							
Chloroethane	ND	1.0	"							
Trichlorofluoromethane	ND	1.0	"							
1,1-Dichloroethylene	ND	1.0	"							
Acetone	ND	10.0	"							
Methyl Iodide	ND	1.0	"							
Carbon Disulfide	ND	1.0	"							
Methylene Chloride	ND	5.0	"							
Acrylonitrile	ND	5.0	"							
trans-1,2-Dichloroethylene	ND	1.0	"							
1,1-Dichloroethane	ND	1.0	"							
Vinyl Acetate	ND	5.0	"							
cis-1,2-Dichloroethylene	ND	1.0	"							
2-Butanone (MEK)	ND	10.0	"							
Bromochloromethane	ND	1.0	"							
Chloroform	ND	1.0	"							
1,1,1-Trichloroethane	ND	1.0	"							
Carbon Tetrachloride	ND	1.0	"							
Benzene	ND	1.0	"							
1,2-Dichloroethane	ND	1.0	"							
Trichloroethylene	ND	1.0	"							
1,2-Dichloropropane	ND	1.0	"							
Dibromomethane	ND	1.0	"							
Bromodichloromethane	ND	1.0	"							
cis-1,3-Dichloropropene	ND	1.0	"							
4-Methyl-2-pentanone (MIBK)	ND	5.0	"							
Toluene	ND	1.0	"							
trans-1,3-Dichloropropene	ND	1.0	"							

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Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD0867 - EPA 5030B

Blank (1GD0867-BLK1)

Prepared: 04/14/23 Analyzed: 04/15/23

1,1,2-Trichloroethane	ND	1.0	ug/L
Tetrachloroethylene	ND	1.0	"
2-Hexanone (MBK)	ND	5.0	"
Dibromochloromethane	ND	1.0	"
1,2-Dibromoethane	ND	1.0	"
Chlorobenzene	ND	1.0	"
1,1,1,2-Tetrachloroethane	ND	1.0	"
Ethylbenzene	ND	1.0	"
Xylenes, total	ND	2.0	"
Styrene	ND	1.0	"
Bromoform	ND	1.0	"
1,2,3-Trichloropropane	ND	1.0	"
trans-1,4-Dichloro-2-butene	ND	5.0	"
1,1,2,2-Tetrachloroethane	ND	1.0	"
1,4-Dichlorobenzene	ND	1.0	"
1,2-Dichlorobenzene	ND	1.0	"
1,2-Dibromo-3-chloropropane	ND	5.0	"

Matrix Spike (1GD0867-MS1)

Source: 1GD1186-01

Prepared & Analyzed: 04/14/23

Surrogate: Dibromofluoromethane	550		ug/L	503.520		109	80-126
Surrogate: Dibromofluoromethane	550		"	503.520		109	75-136
Surrogate: 1,2-Dichloroethane-d4	498		"	504.080		98.9	63-138
Surrogate: 1,2-Dichloroethane-d4	498		"	504.080		98.9	61-142
Surrogate: Toluene-d8	502		"	502.360		100	87-116
Surrogate: Toluene-d8	502		"	502.360		100	82-121
Surrogate: 4-Bromofluorobenzene	494		"	504.200		98.0	85-111
Surrogate: 4-Bromofluorobenzene	494		"	504.200		98.0	80-116
Chloromethane	282.0	10.0	"	300.000	ND	94.0	61-152
Vinyl Chloride	288.4	10.0	"	300.000	ND	96.1	66-149
Bromomethane	359.7	10.0	"	300.000	ND	120	43-171
Chloroethane	327.0	10.0	"	300.000	ND	109	69-148
Trichlorofluoromethane	312.7	10.0	"	300.000	ND	104	62-163
1,1-Dichloroethylene	554.0	10.0	"	500.000	ND	111	70-148
Acetone	917.9	100	"	1041.00	ND	88.2	45-173
Methyl Iodide	1381	10.0	"	1125.63	ND	123	62-167
Carbon Disulfide	1217	10.0	"	1064.00	ND	114	71-163
Methylene Chloride	481.0	50.0	"	500.000	ND	96.2	69-140
Acrylonitrile	916.4	50.0	"	1005.00	ND	91.2	58-151
trans-1,2-Dichloroethylene	521.1	10.0	"	500.000	ND	104	69-144

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Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD0867 - EPA 5030B

Matrix Spike (1GD0867-MS1)	Source: 1GD1186-01			Prepared & Analyzed: 04/14/23						
1,1-Dichloroethane	521.5	10.0	ug/L	500.000	ND	104	70-138			
Vinyl Acetate	844.4	50.0	"	1033.00	ND	81.7	58-142			
cis-1,2-Dichloroethylene	500.5	10.0	"	500.000	ND	100	68-151			
2-Butanone (MEK)	858.1	100	"	1062.00	ND	80.8	50-160			
Bromochloromethane	519.7	10.0	"	500.000	ND	104	65-143			
Chloroform	499.6	10.0	"	500.000	ND	99.9	71-143			
1,1,1-Trichloroethane	474.9	10.0	"	499.750	ND	95.0	63-133			
Carbon Tetrachloride	591.0	10.0	"	500.000	ND	118	63-142			
Benzene	503.9	10.0	"	500.000	ND	101	69-133			
1,2-Dichloroethane	497.2	10.0	"	500.000	ND	99.4	63-138			
Trichloroethylene	421.1	10.0	"	500.000	ND	84.2	71-133			
1,2-Dichloropropane	495.6	10.0	"	500.000	ND	99.1	69-132			
Dibromomethane	521.7	10.0	"	500.000	ND	104	70-147			
Bromodichloromethane	496.6	10.0	"	500.000	ND	99.3	67-130			
cis-1,3-Dichloropropene	496.6	10.0	"	503.250	ND	98.7	61-126			
4-Methyl-2-pentanone (MIBK)	774.8	50.0	"	1031.00	ND	75.2	55-147			
Toluene	499.0	10.0	"	500.000	ND	99.8	71-133			
trans-1,3-Dichloropropene	491.3	10.0	"	504.250	ND	97.4	63-124			
1,1,2-Trichloroethane	483.4	10.0	"	500.000	ND	96.7	69-133			
Tetrachloroethylene	489.3	10.0	"	500.000	ND	97.9	70-124			
2-Hexanone (MBK)	763.8	50.0	"	1103.00	ND	69.2	53-141			
Dibromochloromethane	544.8	10.0	"	495.000	ND	110	74-122			
1,2-Dibromoethane	493.9	10.0	"	500.000	ND	98.8	66-127			
Chlorobenzene	486.6	10.0	"	500.000	ND	97.3	76-116			
1,1,1,2-Tetrachloroethane	531.2	10.0	"	500.000	ND	106	77-121			
Ethylbenzene	479.8	10.0	"	500.000	ND	96.0	73-124			
Xylenes, total	1401	20.0	"	1500.00	ND	93.4	75-123			
Styrene	473.6	10.0	"	500.000	ND	94.7	70-120			
Bromoform	569.9	10.0	"	500.000	ND	114	70-124			
1,2,3-Trichloropropane	482.1	10.0	"	500.000	ND	96.4	62-135			
trans-1,4-Dichloro-2-butene	785.8	50.0	"	1024.00	ND	76.7	50-120			
1,1,2,2-Tetrachloroethane	506.1	10.0	"	498.500	ND	102	63-126			
1,4-Dichlorobenzene	482.0	10.0	"	500.000	ND	96.4	72-119			
1,2-Dichlorobenzene	480.5	10.0	"	500.000	ND	96.1	71-117			
1,2-Dibromo-3-chloropropane	411.3	50.0	"	500.000	ND	82.3	49-134			

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Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD0867 - EPA 5030B

Matrix Spike Dup (1GD0867-MSD1)	Source: 1GD1186-01			Prepared & Analyzed: 04/14/23						
Surrogate: Dibromofluoromethane	542		ug/L	503.520		108	75-136			
Surrogate: Dibromofluoromethane	542		"	503.520		108	80-126			
Surrogate: 1,2-Dichloroethane-d4	491		"	504.080		97.5	61-142			
Surrogate: 1,2-Dichloroethane-d4	491		"	504.080		97.5	63-138			
Surrogate: Toluene-d8	499		"	502.360		99.3	82-121			
Surrogate: Toluene-d8	499		"	502.360		99.3	87-116			
Surrogate: 4-Bromofluorobenzene	491		"	504.200		97.4	85-111			
Surrogate: 4-Bromofluorobenzene	491		"	504.200		97.4	80-116			
Chloromethane	277.4	10.0	"	300.000	ND	92.5	61-152	1.64	26	
Vinyl Chloride	279.9	10.0	"	300.000	ND	93.3	66-149	2.99	23	
Bromomethane	354.7	10.0	"	300.000	ND	118	43-171	1.40	29	
Chloroethane	317.6	10.0	"	300.000	ND	106	69-148	2.92	25	
Trichlorofluoromethane	311.8	10.0	"	300.000	ND	104	62-163	0.288	25	
1,1-Dichloroethylene	541.3	10.0	"	500.000	ND	108	70-148	2.32	22	
Acetone	959.6	100	"	1041.00	ND	92.2	45-173	4.44	30	
Methyl Iodide	1380	10.0	"	1125.63	ND	123	62-167	0.130	24	
Carbon Disulfide	1187	10.0	"	1064.00	ND	112	71-163	2.51	22	
Methylene Chloride	475.5	50.0	"	500.000	ND	95.1	69-140	1.15	19	
Acrylonitrile	932.1	50.0	"	1005.00	ND	92.7	58-151	1.70	15	
trans-1,2-Dichloroethylene	510.1	10.0	"	500.000	ND	102	69-144	2.13	22	
1,1-Dichloroethane	510.0	10.0	"	500.000	ND	102	70-138	2.23	20	
Vinyl Acetate	817.3	50.0	"	1033.00	ND	79.1	58-142	3.26	24	
cis-1,2-Dichloroethylene	490.9	10.0	"	500.000	ND	98.2	68-151	1.94	22	
2-Butanone (MEK)	858.9	100	"	1062.00	ND	80.9	50-160	0.0932	23	
Bromochloromethane	511.4	10.0	"	500.000	ND	102	65-143	1.61	22	
Chloroform	491.2	10.0	"	500.000	ND	98.2	71-143	1.70	21	
1,1,1-Trichloroethane	466.0	10.0	"	499.750	ND	93.2	63-133	1.89	23	
Carbon Tetrachloride	581.7	10.0	"	500.000	ND	116	63-142	1.59	22	
Benzene	497.9	10.0	"	500.000	ND	99.6	69-133	1.20	18	
1,2-Dichloroethane	493.3	10.0	"	500.000	ND	98.7	63-138	0.787	20	
Trichloroethylene	418.7	10.0	"	500.000	ND	83.7	71-133	0.572	23	
1,2-Dichloropropane	498.2	10.0	"	500.000	ND	99.6	69-132	0.523	20	
Dibromomethane	524.4	10.0	"	500.000	ND	105	70-147	0.516	22	
Bromodichloromethane	487.7	10.0	"	500.000	ND	97.5	67-130	1.81	21	
cis-1,3-Dichloropropene	495.9	10.0	"	503.250	ND	98.5	61-126	0.141	21	
4-Methyl-2-pentanone (MIBK)	795.0	50.0	"	1031.00	ND	77.1	55-147	2.57	23	
Toluene	496.0	10.0	"	500.000	ND	99.2	71-133	0.603	19	
trans-1,3-Dichloropropene	486.9	10.0	"	504.250	ND	96.6	63-124	0.900	21	

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Determination of Volatile Organic Compounds - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD0867 - EPA 5030B

Matrix Spike Dup (1GD0867-MSD1)	Source: 1GD1186-01			Prepared & Analyzed: 04/14/23						
1,1,2-Trichloroethane	486.8	10.0	ug/L	500.000	ND	97.4	69-133	0.701	19	
Tetrachloroethylene	484.0	10.0	"	500.000	ND	96.8	70-124	1.09	24	
2-Hexanone (MBK)	792.7	50.0	"	1103.00	ND	71.9	53-141	3.71	24	
Dibromochloromethane	545.2	10.0	"	495.000	ND	110	74-122	0.0734	21	
1,2-Dibromoethane	491.8	10.0	"	500.000	ND	98.4	66-127	0.426	23	
Chlorobenzene	486.3	10.0	"	500.000	ND	97.3	76-116	0.0617	21	
1,1,1,2-Tetrachloroethane	535.1	10.0	"	500.000	ND	107	77-121	0.731	25	
Ethylbenzene	472.0	10.0	"	500.000	ND	94.4	73-124	1.64	20	
Xylenes, total	1395	20.0	"	1500.00	ND	93.0	75-123	0.422	20	
Styrene	471.1	10.0	"	500.000	ND	94.2	70-120	0.529	23	
Bromoform	590.7	10.0	"	500.000	ND	118	70-124	3.58	22	
1,2,3-Trichloropropane	494.4	10.0	"	500.000	ND	98.9	62-135	2.52	28	
trans-1,4-Dichloro-2-butene	817.2	50.0	"	1024.00	ND	79.8	50-120	3.92	26	
1,1,2,2-Tetrachloroethane	511.9	10.0	"	498.500	ND	103	63-126	1.14	24	
1,4-Dichlorobenzene	487.8	10.0	"	500.000	ND	97.6	72-119	1.20	24	
1,2-Dichlorobenzene	479.4	10.0	"	500.000	ND	95.9	71-117	0.229	24	
1,2-Dibromo-3-chloropropane	432.6	50.0	"	500.000	ND	86.5	49-134	5.05	28	

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Work Order: 1GD1403

Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD1060 - EPA 3005A Total Recoverable Metals

Blank (1GD1060-BLK1)

Prepared: 04/20/23 Analyzed: 04/24/23

Antimony, total	ND	0.0020	mg/L
Arsenic, total	ND	0.0040	"
Barium, total	ND	0.0040	"
Beryllium, total	ND	0.0040	"
Cadmium, total	ND	0.0008	"
Chromium, total	ND	0.0080	"
Cobalt, total	ND	0.0004	"
Copper, total	ND	0.0040	"
Lead, total	ND	0.0040	"
Nickel, total	ND	0.0040	"
Selenium, total	ND	0.0040	"
Silver, total	ND	0.0040	"
Thallium, total	ND	0.0020	"
Vanadium, total	ND	0.0200	"
Zinc, total	ND	0.0200	"

LCS (1GD1060-BS1)

Prepared: 04/20/23 Analyzed: 04/24/23

Antimony, total	0.0919	0.0020	mg/L	0.100000	91.9	80-120
Arsenic, total	0.0922	0.0040	"	0.100000	92.2	80-120
Barium, total	0.0992	0.0040	"	0.100000	99.2	80-120
Beryllium, total	0.0953	0.0040	"	0.100000	95.3	80-120
Cadmium, total	0.0914	0.0008	"	0.100000	91.4	80-120
Chromium, total	0.0924	0.0080	"	0.100000	92.4	80-120
Cobalt, total	0.0973	0.0004	"	0.100000	97.3	80-120
Copper, total	0.0956	0.0040	"	0.100000	95.6	80-120
Lead, total	0.0915	0.0040	"	0.100000	91.5	80-120
Nickel, total	0.0940	0.0040	"	0.100000	94.0	80-120
Selenium, total	0.0925	0.0040	"	0.100000	92.5	80-120
Silver, total	0.0978	0.0040	"	0.100000	97.8	80-120
Thallium, total	0.0912	0.0020	"	0.100000	91.2	80-120
Vanadium, total	0.0962	0.0200	"	0.100000	96.2	80-120
Zinc, total	0.0953	0.0200	"	0.100000	95.3	80-120

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

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PO Box 314
Story City, IA 50248

Work Order: 1GD1403

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Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD1060 - EPA 3005A Total Recoverable Metals

Matrix Spike (1GD1060-MS1)	Source: 1GD1403-01			Prepared: 04/20/23 Analyzed: 04/24/23						
Antimony, total	0.0910	0.0020	mg/L	0.100000	ND	91.0	75-125			
Arsenic, total	0.0974	0.0040	"	0.100000	0.0025	94.9	75-125			
Barium, total	0.131	0.0040	"	0.100000	0.0294	102	75-125			
Beryllium, total	0.0928	0.0040	"	0.100000	0.0001	92.8	75-125			
Cadmium, total	0.0893	0.0008	"	0.100000	0.0001	89.1	75-125			
Chromium, total	0.0944	0.0080	"	0.100000	0.0033	91.1	75-125			
Cobalt, total	0.0980	0.0004	"	0.100000	0.0018	96.2	75-125			
Copper, total	0.0916	0.0040	"	0.100000	0.0074	84.2	75-125			
Lead, total	0.0879	0.0040	"	0.100000	0.0014	86.5	75-125			
Nickel, total	0.0954	0.0040	"	0.100000	0.0062	89.2	75-125			
Selenium, total	0.0940	0.0040	"	0.100000	ND	94.0	75-125			
Silver, total	0.0933	0.0040	"	0.100000	ND	93.3	75-125			
Thallium, total	0.0871	0.0020	"	0.100000	0.0003	86.8	75-125			
Vanadium, total	0.107	0.0200	"	0.100000	ND	107	75-125			
Zinc, total	0.0977	0.0200	"	0.100000	ND	97.7	75-125			

Matrix Spike Dup (1GD1060-MSD1)	Source: 1GD1403-01			Prepared: 04/20/23 Analyzed: 04/24/23						
Antimony, total	0.0911	0.0020	mg/L	0.100000	ND	91.1	75-125	0.144	20	
Arsenic, total	0.0975	0.0040	"	0.100000	0.0025	95.0	75-125	0.112	20	
Barium, total	0.133	0.0040	"	0.100000	0.0294	104	75-125	1.63	20	
Beryllium, total	0.0903	0.0040	"	0.100000	0.0001	90.3	75-125	2.69	20	
Cadmium, total	0.0894	0.0008	"	0.100000	0.0001	89.3	75-125	0.177	20	
Chromium, total	0.0941	0.0080	"	0.100000	0.0033	90.7	75-125	0.359	20	
Cobalt, total	0.0982	0.0004	"	0.100000	0.0018	96.4	75-125	0.170	20	
Copper, total	0.0886	0.0040	"	0.100000	0.0074	81.2	75-125	3.31	20	
Lead, total	0.0875	0.0040	"	0.100000	0.0014	86.2	75-125	0.371	20	
Nickel, total	0.0934	0.0040	"	0.100000	0.0062	87.3	75-125	2.10	20	
Selenium, total	0.0969	0.0040	"	0.100000	ND	96.9	75-125	2.99	20	
Silver, total	0.0951	0.0040	"	0.100000	ND	95.1	75-125	1.91	20	
Thallium, total	0.0875	0.0020	"	0.100000	0.0003	87.2	75-125	0.535	20	
Vanadium, total	0.106	0.0200	"	0.100000	ND	106	75-125	0.558	20	
Zinc, total	0.0967	0.0200	"	0.100000	ND	96.7	75-125	1.08	20	

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

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PO Box 314
Story City, IA 50248

Work Order: 1GD1403

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Determination of Total Metals - Quality Control
Keystone Laboratories - Newton

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 1GD1060 - EPA 3005A Total Recoverable Metals

Post Spike (1GD1060-PS1)	Source: 1GD1403-01			Prepared: 04/20/23 Analyzed: 04/24/23						
Antimony, total	0.0819		mg/L	0.0800000	0.0003	102	80-120			
Arsenic, total	0.0872		"	0.0800000	0.0024	106	80-120			
Barium, total	0.113		"	0.0800000	0.0288	106	80-120			
Beryllium, total	0.0799		"	0.0800000	0.0001	99.7	80-120			
Cadmium, total	0.0787		"	0.0800000	0.0001	98.2	80-120			
Chromium, total	0.0812		"	0.0800000	0.0033	97.4	80-120			
Cobalt, total	0.0902		"	0.0800000	0.0018	110	80-120			
Copper, total	0.0848		"	0.0800000	0.0073	96.9	80-120			
Lead, total	0.0769		"	0.0800000	0.0014	94.5	80-120			
Nickel, total	0.0886		"	0.0800000	0.0060	103	80-120			
Selenium, total	0.0824		"	0.0800000	0.0005	102	80-120			
Silver, total	0.0839		"	0.0800000	0.0010	104	80-120			
Thallium, total	0.0775		"	0.0800000	0.0003	96.5	80-120			
Vanadium, total	0.0930		"	0.0800000	0.0100	104	80-120			
Zinc, total	0.0891		"	0.0800000	0.0105	98.3	80-120			

ND = Non Detect; REC= Recovery; RPD= Relative Percent Difference

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

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PO Box 314
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Work Order: 1GD1403

Certified Analyses Included In This Report

Method/Matrix	Analyte	Certifications
EPA 6020A in Water		
	Antimony, total	SIA1X,KS-NT
	Arsenic, total	SIA1X,KS-NT
	Barium, total	SIA1X,KS-NT
	Beryllium, total	SIA1X,KS-NT
	Cadmium, total	SIA1X,KS-NT
	Chromium, total	SIA1X,KS-NT
	Cobalt, total	SIA1X,KS-NT
	Copper, total	SIA1X,KS-NT
	Lead, total	SIA1X,KS-NT
	Nickel, total	SIA1X,KS-NT
	Selenium, total	SIA1X,KS-NT
	Silver, total	SIA1X,KS-NT
	Thallium, total	SIA1X,KS-NT
	Vanadium, total	SIA1X,KS-NT
	Zinc, total	SIA1X,KS-NT
EPA 8260B in Water		
	Chloromethane	KS-NT,SIA1X
	Vinyl Chloride	KS-NT,SIA1X
	Bromomethane	KS-NT,SIA1X
	Chloroethane	KS-NT,SIA1X
	Trichlorofluoromethane	KS-NT,SIA1X
	1,1-Dichloroethylene	KS-NT,SIA1X
	Acetone	KS-NT,SIA1X
	Methyl Iodide	SIA1X
	Carbon Disulfide	KS-NT,SIA1X
	Methylene Chloride	KS-NT,SIA1X
	Acrylonitrile	KS-NT,SIA1X
	trans-1,2-Dichloroethylene	KS-NT,SIA1X
	1,1-Dichloroethane	KS-NT,SIA1X
	Vinyl Acetate	KS-NT,SIA1X
	cis-1,2-Dichloroethylene	KS-NT,SIA1X
	2-Butanone (MEK)	KS-NT,SIA1X
	Bromochloromethane	KS-NT,SIA1X
	Chloroform	KS-NT,SIA1X
	1,1,1-Trichloroethane	KS-NT,SIA1X
	Carbon Tetrachloride	KS-NT,SIA1X
	Benzene	KS-NT,SIA1X
	1,2-Dichloroethane	KS-NT,SIA1X
	Trichloroethylene	KS-NT,SIA1X
	1,2-Dichloropropane	KS-NT,SIA1X
	Dibromomethane	SIA1X
	Bromodichloromethane	KS-NT,SIA1X
	cis-1,3-Dichloropropene	KS-NT,SIA1X
	4-Methyl-2-pentanone (MIBK)	KS-NT,SIA1X
	Toluene	KS-NT,SIA1X
	trans-1,3-Dichloropropene	KS-NT,SIA1X

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.

HLW Engineering
PO Box 314
Story City, IA 50248

May 01, 2023
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Work Order: 1GD1403

1,1,2-Trichloroethane	KS-NT,SIA1X
Tetrachloroethylene	KS-NT,SIA1X
2-Hexanone (MBK)	KS-NT,SIA1X
Dibromochloromethane	KS-NT,SIA1X
1,2-Dibromoethane	KS-NT,SIA1X
Chlorobenzene	KS-NT,SIA1X
1,1,1,2-Tetrachloroethane	KS-NT,SIA1X
Ethylbenzene	KS-NT,SIA1X
Xylenes, total	KS-NT,SIA1X
Styrene	KS-NT,SIA1X
Bromoform	KS-NT,SIA1X
1,2,3-Trichloropropane	KS-NT,SIA1X
trans-1,4-Dichloro-2-butene	SIA1X
1,1,2,2-Tetrachloroethane	KS-NT,SIA1X
1,4-Dichlorobenzene	KS-NT,SIA1X
1,2-Dichlorobenzene	KS-NT,SIA1X
1,2-Dibromo-3-chloropropane	KS-NT,SIA1X

Code	Description	Number	Expires
KS-KC	Kansas Department of Health and Environment-KC	E-10110	04/30/2024
KS-NT	Kansas Department of Health and Environment (NELAP)	E-10287	10/31/2023
MO-KC	Missouri Department of Natural Resources (KC)	140	04/30/2023
MO-NT	Missouri Department of Natural Resources (Newton)	10170	04/30/2026
SIA1X	Iowa Dept. of Natural Resources	95	02/01/2024

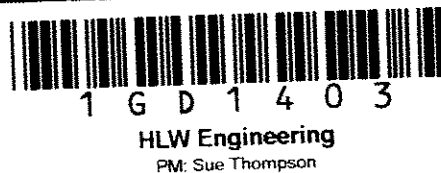
End of Report

Sue Thompson

Keystone Laboratories

Sue Thompson
Client Services Manager

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety. Samples were preserved in accordance with 40 CFR for pH adjustment unless otherwise noted. MRL= Method Reporting Limit.



SITE INFORMATION

Sampler: LGH
Project: Lucas-Monroe SLF-New Regs
6010

SPECIAL INSTRUCTIONS

None

Turn Around Time

☒ Standard ☐ RUSH, need by / /

REPORT TO

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

INVOICE TO

Laura Liegois
Chariton City Hall
115 S Main St
Chariton, IA 50049

LAB USE ONLY

Work Order 1GDI403
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
01-001	MW-1R	Water	GRAB	4/12/23	9:05	<u>1</u>	Indfil-app1-metals-6020	<u>01</u>
02-001	MW-12	Water	GRAB	4/12/23	8:50	<u>1</u>	Indfil-app1-metals-6020	<u>02</u>
03-001	MW-7	Water	GRAB	4/12/23	9:31	<u>7</u>	Indfil-app1-voc-group Indfil-app1-metals-6020	<u>03</u>
04-001	Duplicate	Water	GRAB	4/12/23	9:05	<u>1</u>	Indfil-app1-metals-6020	<u>04</u>

Relinquished By [Signature] Date/Time 4/13/23

Received By Date/Time

Relinquished By [Signature] Date/Time 4/13/23 9:50

Received for Lab By Date/Time

Remarks:

Original - Lab Copy Yellow - Sampler Copy



Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Project Description

Lucas-Monroe SLF-New Regs

For:

Todd Whipple

HLW Engineering

PO Box 314

Story City, IA 50248

A handwritten signature in black ink that reads "Heather Murphy". The signature is written in a cursive style with a horizontal line underneath the name.

Heather Murphy

Customer Relationship Specialist

Wednesday, November 15, 2023

Please find enclosed the analytical results for the samples you submitted to Microbac Laboratories. Review and compilation of your report was completed by Keystone Laboratories - 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.

Microbac Laboratories, Inc.

600 East 17th Street South | Newton, IA 50208 | 641-792-8451 p | www.microbac.com



Keystone Laboratories - Newton
CERTIFICATE OF ANALYSIS
1GJ0832

HLW Engineering

Todd Whipple
PO Box 314
Story City, IA 50248

Project Name: Lucas-Monroe SLF-New Regs

Project / PO Number: / 6010
Received: 10/10/2023
Reported: 11/15/2023

Sample Summary Report

<u>Sample Name</u>	<u>Laboratory ID</u>	<u>Client Matrix</u>	<u>Sample Type</u>	<u>Sample Begin</u>	<u>Sample Taken</u>	<u>Lab Received</u>
MW-1R	1GJ0832-01	Water	GRAB		10/06/23 08:41	10/10/23 11:05
MW-12	1GJ0832-02	Water	GRAB		10/06/23 08:28	10/10/23 11:05
Duplicate	1GJ0832-03	Water	GRAB		10/06/23 00:00	10/10/23 11:05

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Analytical Testing Parameters

Client Sample ID:	MW-1R	Collected By:	Whipple, Todd
Sample Matrix:	Water	Collection Date:	10/06/2023 8:41
Lab Sample ID:	1GJ0832-01		

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		10/16/23 1629	10/18/23 1652	RVV
Arsenic, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Barium, total	0.0147	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Beryllium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Cadmium, total	<0.0008	0.0008	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Chromium, total	<0.0080	0.0080	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Cobalt, total	0.0005	0.0004	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Copper, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Lead, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Nickel, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Selenium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Silver, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Thallium, total	<0.0020	0.0020	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Vanadium, total	<0.0200	0.0200	mg/L	4		10/16/23 1629	10/18/23 1652	RVV
Zinc, total	<0.0200	0.0200	mg/L	4		10/16/23 1629	10/18/23 1652	RVV

Client Sample ID:	MW-12	Collected By:	Whipple, Todd
Sample Matrix:	Water	Collection Date:	10/06/2023 8:28
Lab Sample ID:	1GJ0832-02		

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		10/16/23 1629	10/18/23 1658	RVV
Arsenic, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Barium, total	0.144	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Beryllium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Cadmium, total	<0.0008	0.0008	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Chromium, total	<0.0080	0.0080	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Cobalt, total	<0.0004	0.0004	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Copper, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Lead, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Nickel, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Selenium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Silver, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Thallium, total	<0.0020	0.0020	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Vanadium, total	<0.0200	0.0200	mg/L	4		10/16/23 1629	10/18/23 1658	RVV
Zinc, total	<0.0200	0.0200	mg/L	4		10/16/23 1629	10/18/23 1658	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Client Sample ID:	Duplicate	Collected By:	Whipple, Todd
Sample Matrix:	Water	Collection Date:	10/06/2023
Lab Sample ID:	1GJ0832-03		

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		10/16/23 1629	10/18/23 1704	RVV
Arsenic, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Barium, total	0.145	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Beryllium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Cadmium, total	<0.0008	0.0008	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Chromium, total	<0.0080	0.0080	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Cobalt, total	<0.0004	0.0004	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Copper, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Lead, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Nickel, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Selenium, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Silver, total	<0.0040	0.0040	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Thallium, total	<0.0020	0.0020	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Vanadium, total	<0.0200	0.0200	mg/L	4		10/16/23 1629	10/18/23 1704	RVV
Zinc, total	0.0243	0.0200	mg/L	4		10/16/23 1629	10/18/23 1704	RVV

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Batch Log Summary

Method	Batch	Laboratory ID	Client / Source ID
EPA 6020A	1GJ0960	1GJ0960-BLK1	
		1GJ0960-BS1	
		1GJ0832-01	MW-1R
		1GJ0832-02	MW-12
		1GJ0832-03	Duplicate
		1GJ0960-MS1	1GJ1145-01
		1GJ0960-MSD1	1GJ1145-01
		1GJ0960-PS1	1GJ1145-01

Batch Quality Control Summary: Keystone Laboratories - Newton

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ0960 - EPA 3005A Total Recoverable Metals - EPA 6020A										

Blank (1GJ0960-BLK1)

Prepared: 10/16/23 16:29 Analyzed: 10/18/23 16:39

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
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
Zinc, total	<0.0200	0.0200	mg/L

LCS (1GJ0960-BS1)

Prepared: 10/16/23 16:29 Analyzed: 10/18/23 16:46

Antimony, total	0.101	0.0020	mg/L	0.100	101	80-120	
Arsenic, total	0.0993	0.0040	mg/L	0.100	99.3	80-120	
Barium, total	0.108	0.0040	mg/L	0.100	108	80-120	
Beryllium, total	0.102	0.0040	mg/L	0.100	102	80-120	
Cadmium, total	0.101	0.0008	mg/L	0.100	101	80-120	
Chromium, total	0.100	0.0080	mg/L	0.100	100	80-120	
Cobalt, total	0.102	0.0004	mg/L	0.100	102	80-120	
Copper, total	0.323	0.0040	mg/L	0.100	323	80-120	QS-01
Lead, total	0.103	0.0040	mg/L	0.100	103	80-120	
Nickel, total	0.177	0.0040	mg/L	0.100	177	80-120	QS-01
Selenium, total	0.0986	0.0040	mg/L	0.100	98.6	80-120	
Silver, total	0.112	0.0040	mg/L	0.100	112	80-120	
Thallium, total	0.102	0.0020	mg/L	0.100	102	80-120	

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ0960 - EPA 3005A Total Recoverable Metals - EPA 6020A										
LCS (1GJ0960-BS1)				Prepared: 10/16/23 16:29 Analyzed: 10/18/23 16:46						
Vanadium, total	0.101	0.0200	mg/L	0.100		101	80-120			
Zinc, total	0.101	0.0200	mg/L	0.100		101	80-120			
Matrix Spike (1GJ0960-MS1)				Source: 1GJ1145-01		Prepared: 10/16/23 16:29 Analyzed: 10/18/23 17:28				
Antimony, total	0.101	0.0020	mg/L	0.100	ND	101	75-125			
Arsenic, total	0.102	0.0040	mg/L	0.100	0.0011	101	75-125			
Barium, total	0.200	0.0040	mg/L	0.100	0.0898	110	75-125			
Beryllium, total	0.102	0.0040	mg/L	0.100	ND	102	75-125			
Cadmium, total	0.101	0.0008	mg/L	0.100	ND	101	75-125			
Chromium, total	0.0994	0.0080	mg/L	0.100	ND	99.4	75-125			
Cobalt, total	0.103	0.0004	mg/L	0.100	ND	103	75-125			
Copper, total	0.0955	0.0040	mg/L	0.100	ND	95.5	75-125			
Lead, total	0.0989	0.0040	mg/L	0.100	ND	98.9	75-125			
Nickel, total	0.0994	0.0040	mg/L	0.100	ND	99.4	75-125			
Selenium, total	0.0993	0.0040	mg/L	0.100	ND	99.3	75-125			
Silver, total	0.112	0.0040	mg/L	0.100	ND	112	75-125			
Thallium, total	0.101	0.0020	mg/L	0.100	ND	101	75-125			
Vanadium, total	0.106	0.0200	mg/L	0.100	ND	106	75-125			
Zinc, total	0.0985	0.0200	mg/L	0.100	ND	98.5	75-125			
Matrix Spike Dup (1GJ0960-MSD1)				Source: 1GJ1145-01		Prepared: 10/16/23 16:29 Analyzed: 10/18/23 17:34				
Antimony, total	0.109	0.0020	mg/L	0.100	ND	109	75-125	8.47	20	
Arsenic, total	0.111	0.0040	mg/L	0.100	0.0011	110	75-125	8.52	20	
Barium, total	0.219	0.0040	mg/L	0.100	0.0898	129	75-125	8.85	20	QM-07
Beryllium, total	0.146	0.0040	mg/L	0.100	ND	146	75-125	35.7	20	QM-07
Cadmium, total	0.110	0.0008	mg/L	0.100	ND	110	75-125	8.12	20	
Chromium, total	0.109	0.0080	mg/L	0.100	ND	109	75-125	9.12	20	
Cobalt, total	0.111	0.0004	mg/L	0.100	ND	111	75-125	7.72	20	
Copper, total	0.103	0.0040	mg/L	0.100	ND	103	75-125	7.80	20	
Lead, total	0.108	0.0040	mg/L	0.100	ND	108	75-125	8.77	20	
Nickel, total	0.108	0.0040	mg/L	0.100	ND	108	75-125	8.28	20	
Selenium, total	0.1087	0.0040	mg/L	0.100	ND	109	75-125	9.05	20	
Silver, total	0.120	0.0040	mg/L	0.100	ND	120	75-125	7.13	20	
Thallium, total	0.110	0.0020	mg/L	0.100	ND	110	75-125	9.14	20	
Vanadium, total	0.116	0.0200	mg/L	0.100	ND	116	75-125	8.90	20	
Zinc, total	0.106	0.0200	mg/L	0.100	ND	106	75-125	7.18	20	
Post Spike (1GJ0960-PS1)				Source: 1GJ1145-01		Prepared: 10/16/23 16:29 Analyzed: 10/18/23 17:40				
Antimony, total	0.0803		mg/L	0.0800	0.0002	100	80-120			
Arsenic, total	0.0823		mg/L	0.0800	0.0011	102	80-120			
Barium, total	0.171		mg/L	0.0800	0.0880	103	80-120			
Beryllium, total	0.0798		mg/L	0.0800	0.0000008	99.8	80-120			
Cadmium, total	0.0777		mg/L	0.0800	0.00006	97.0	80-120			
Chromium, total	0.0775		mg/L	0.0800	0.0004	96.4	80-120			
Cobalt, total	0.0808		mg/L	0.0800	0.00002	101	80-120			
Copper, total	0.0744		mg/L	0.0800	0.00007	93.0	80-120			

Keystone Laboratories - Newton

CERTIFICATE OF ANALYSIS

1GJ0832

Determination of Total Metals	Result	RL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1GJ0960 - EPA 3005A Total Recoverable Metals - EPA 6020A										
Post Spike (1GJ0960-PS1)		Source: 1GJ1145-01		Prepared: 10/16/23 16:29 Analyzed: 10/18/23 17:40						
Lead, total	0.0770		mg/L	0.0800	0.00003	96.2	80-120			
Nickel, total	0.0787		mg/L	0.0800	0.0002	98.1	80-120			
Selenium, total	0.0752		mg/L	0.0800	-0.0003	94.0	80-120			
Silver, total	0.0861		mg/L	0.0800	0.0014	106	80-120			
Thallium, total	0.0780		mg/L	0.0800	0.00006	97.4	80-120			
Vanadium, total	0.0850		mg/L	0.0800	0.0051	99.8	80-120			
Zinc, total	0.0743		mg/L	0.0800	0.0030	89.2	80-120			

Definitions

QM-07:	The spike recovery and/or RPD was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QS-01:	The blank spike recovery and/or blank spike duplicate recovery were outside the established acceptance limits. Batch was accepted based on acceptable MS/MSD/RPD results.
RL:	Reporting Limit
RPD:	Relative Percent Difference

Cooler Receipt Log

Cooler ID: Default Cooler Temp: 0.3°C

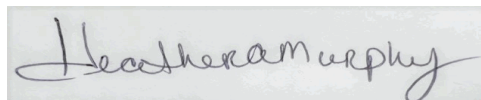
Cooler Inspection Checklist

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
11/15/23 16:56



HLW Engineering
PM: Sue Thompson

SITE INFORMATION

Sampler: TODD WHIPPLE
Project: Lucas-Monroe SLF-New Regs
6010

REPORT TO

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

Christy Metzger
Chariton City Hall
115 S Main St
Chariton, IA 50049

SPECIAL INSTRUCTIONS

None

Turn Around Time

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

LAB USE ONLY

Work Order 1650832
Temperature 0.3
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
01-001	MW-1R	Water	GRAB	10/6/23	8:41 8:28	1	Indfil-app1-metals-6020	01
02-001	MW-12	Water	GRAB	10/6/23	8:28	1	Indfil-app1-metals-6020	02
03-001	MW-7 DRY	Water	GRAB	10/6/23	—	0	Indfil-app1-voc-group Indfil-app1-metals-6020	—
04-001	Duplicate	Water	GRAB	10/6/23	✓	1	Indfil-app1-metals-6020	03

[Signature] 10/10/23
Relinquished By Date/Time

Relinquished By Date/Time

Received By Date/Time

[Signature] 10-10-23 1105
Received for Lab By Date/Time

Remarks:

Original - Lab Copy Yellow - Sampler Copy

ATTACHMENT B

Field Sampling Forms

**LUCAS-MONROE SANITARY LANDFILL
PERMIT # 68-SDP-1-75C**

4/12/2023

Sampled by: Glenn Hunter

Weather conditions: Sunny, 65-70 degrees, slight breeze

IDNR Form 542-1322

Monitoring Well: MW-1R (up)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	1010.85
Well Depth	72.00
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	1010.85
Well Depth	72.00
Top Screen	948.85
Bottom Screen	938.85
Bottom Well	938.85
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	66.00
Top sample	944.85
Bottom sample	940.85
Turbidity(NTU)	217.00

Date	Time	Water Level	Water Elevation	Notes
4/12/2023	9:05	25.14	985.71	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All Field NTU	10	10		217.00
Appendix I Metals	250	250		217.00
Appendix I VOC	120			
Full Appendix II 10 more containers	5620			
TSS TSS	1000			
Supplemental				
Supplemental				
Total		260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	1010.85	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	72.00	Before purging	4/12/2023	9:05	25.14	985.71	0	0.0	No
		After purging				1010.85			
		Top of Screen 2007				948.85			
						62.00	feet above (+) or below (-) top screen		
		Bottom of Well 2007				938.85			
		Bottom of Well	4/12/2023		72.60	938.25			
						-0.60	feet sedimentation		
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			

IDNR Form 542-1322

Monitoring Well: MW-7 (dg)

Primary Sampling Method:

No-Purge for Appendix I

Secondary Sampling Method:

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	943.61
Well Depth	17.59
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	943.61
Well Depth	17.59
Top Screen	930.50
Bottom Screen	925.50
Bottom Well	925.50
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	11.00
Top sample	932.61
Bottom sample	928.61
Turbidity(NTU)	13.60

Date	Time	Water Level	Water Elevation	Notes
4/12/2023	9:31	8.32	935.29	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10	13.60
Appendix I	Metals	250	250	13.60
Appendix I	VOC	120	120	13.60
Full Appendix II	10 more containers	5620		
TSS	TSS	1000		
Supplemental				
Supplemental				
Total		380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	943.61	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	17.59	Before purging	4/12/2023	9:31	8.32	935.29		0.0	NO
		After purging				943.61	note: 4" casing		
		Top of Screen 1988				930.50			
						13.11	feet above (+) or below (-) top screen		
		Bottom of Well 1988				925.50			
		4/17/2017	4/12/2023		17.10	926.51			
						1.01	feet sedimentation		
		Recovery				943.61			
		Recovery				943.61			
		Recovery				943.61			
		Recovery				943.61			
		Before Sampling				943.61			

IDNR Form 542-1322

Monitoring Well: MW-12 (up)

Primary Sampling Method:

No-Purge for Appendix I

Secondary Sampling Method:

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	1011.48
Well Depth	57.11
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	1011.48
Well Depth	57.11
Top Screen	974.20
Bottom Screen	954.20
Bottom Well	954.20
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	50.00
Top sample	961.48
Bottom sample	957.48
Turbidity(NTU)	5.63

Date	Time	Water Level	Water Elevation	Notes
4/12/2023	8:50	26.64	984.84	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10	5.63
Appendix I	Metals	250	250	5.63
Appendix I	VOC	120		
Full Appendix II	10 more containers	5620		
TSS	TSS	1000		
Supplemental				
Supplemental				
Total		260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	1011.48	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	57.11	Before purging	4/12/2023	8:50	26.64	984.84		0.0	no
		After purging				1011.48			
		Top of Screen 1992				974.20			
						37.28			feet above (+) or below (-) top screen
		Bottom of Well 1992				954.20			
		Bottom of Well	4/12/2023		56.60	954.88			
						0.68			feet sedimentation
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Before Sampling				1011.48			

**LUCAS-MONROE SANITARY LANDFILL
PERMIT # 68-SDP-1-75C**

10/6/2023

Sampled by: Todd Whipple

Weather conditions: Overcast, windy, drizzle, 45 degrees

IDNR Form 542-1322

Monitoring Well: MW-1R (up)

Primary Sampling Method:
Secondary Sampling Method:

No-Purge for Appendix I
Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	1010.85
Well Depth	72.00
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	1010.85
Well Depth	72.00
Top Screen	948.85
Bottom Screen	938.85
Bottom Well	938.85
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	66.00
Top sample	944.85
Bottom sample	940.85
Turbidity(NTU)	19.42

Date	Time	Water Level	Water Elevation	Notes
10/6/2023	8:41	27.40	983.45	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All Field NTU	10	10		19.42
Appendix I Metals	250	250		19.42
Appendix I VOC	120			
Full Appendix II 10 more containers	5620			
TSS TSS	1000			
Supplemental				
Supplemental				
Total		260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	1010.85	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	72.00	Before purging	10/6/2023	8:41	27.40	983.45	0	0.0	No
		After purging				1010.85			
		Top of Screen 2007				948.85			
						62.00	feet above (+) or below (-) top screen		
		Bottom of Well 2007				938.85			
		Bottom of Well	10/6/2023		72.60	938.25			
						-0.60	feet sedimentation		
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			
		Recovery				1010.85			

IDNR Form 542-1322

Monitoring Well: MW-7 (dg)

Primary Sampling Method:

No-Purge for Appendix I

Secondary Sampling Method:

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	943.61
Well Depth	17.59
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	943.61
Well Depth	17.59
Top Screen	930.50
Bottom Screen	925.50
Bottom Well	925.50
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	
Top sample	943.61
Bottom sample	939.61
Turbidity(NTU)	

Date	Time	Water Level	Water Elevation	Notes
10/6/2023	9:08	16.42	927.19	No Sample

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10	0.00
Appendix I	Metals	250	250	0.00
Appendix I	VOC	120	120	0.00
Full Appendix II	10 more containers	5620		
TSS	TSS	1000		
Supplemental				
Supplemental				
Total		380	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	943.61	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	17.59	Before purging	10/6/2023	9:08	16.42	927.19		0.0	
		After purging				943.61	note: 4" casing		
		Top of Screen 1988				930.50			
						13.11	feet above (+) or below (-) top screen		
		Bottom of Well 1988				925.50			
		4/17/2017	10/6/2023		17.10	926.51			
						1.01	feet sedimentation		
		Recovery				943.61			
		Recovery				943.61			
		Recovery				943.61			
		Recovery				943.61			
		Before Sampling				943.61			

IDNR Form 542-1322

Monitoring Well: MW-12 (up)

Primary Sampling Method:

No-Purge for Appendix I

Secondary Sampling Method:

Purge & Sample for all analytes beyond Appendix I

GENERAL INFORMATION

TOC	1011.48
Well Depth	57.11
Capped	YES
Standing Water	NO
Litter	NO
Level Tape	Solinst 101
NTU Meter	Hach 2100P
No-Purge Equipment -	Solinst 429
Purge Equipment -	Waterra

NO PURGE METHOD

TOC	1011.48
Well Depth	57.11
Top Screen	974.20
Bottom Screen	954.20
Bottom Well	954.20
Sampler Length (ft)	4.00
Sampler Volume (mL)	440.00
Feet cordage	50.00
Top sample	961.48
Bottom sample	957.48
Turbidity(NTU)	2.46

Date	Time	Water Level	Water Elevation	Notes
10/6/2023	8:28	28.99	982.49	

ANALYTES, CONTAINERS, AND VOLUMES

Analyte	Required Volume (mL)	Volume Collected No-Purge (mL)	Volume Collected Purge & Sample (mL)	Turbidity this Container (NTU)
All	Field NTU	10	10	2.46
Appendix I	Metals	250	250	2.46
Appendix I	VOC	120		
Full Appendix II	10 more containers	5620		
TSS	TSS	1000		
Supplemental				
Supplemental				
Total		260	0	

PURGE & SAMPLE METHOD - Purge by Waterra Inertial Lift Pump, then well rest, then sample collection

TOC	1011.48	2" dia.	Date	Time	Depth	Elevation	Gallons	# of Vol.	Purged Dry?
Well Depth	57.11	Before purging	10/6/2023	8:28	28.99	982.49		0.0	
		After purging				1011.48			
		Top of Screen 1992				974.20			
						37.28			feet above (+) or below (-) top screen
		Bottom of Well 1992				954.20			
		Bottom of Well	10/6/2023		56.60	954.88			
						0.68			feet sedimentation
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Recovery				1011.48			
		Before Sampling				1011.48			

ATTACHMENT C

Calculation of Site-Specific GWPS

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	Mean	STD	Mean+2STD
Arsenic, total	10/1/2015	0.01	0.01	mg/L	0.002	0.002	0.002532	0.00182865	0.006189649
Arsenic, total	4/21/2016	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/7/2016	0.01	0.01	mg/L	0.002	0.0111			
Arsenic, total	4/17/2017	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/2/2017	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	4/17/2018	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/11/2018	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	4/17/2019	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/7/2019	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	4/14/2020	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/7/2020	0.01	0.01	mg/L	0.002	0.0066			
Arsenic, total	3/5/2021	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	9/22/2021	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	4/1/2022	0.01	0.01	mg/L	0.0064	0.002			
Arsenic, total	10/3/2022	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	4/12/2023	0.01	0.01	mg/L	0.002	0.002			
Arsenic, total	10/6/2023	0.01	0.01	mg/L	0.002	0.002			
Barium, total	10/1/2015	2	2	mg/L	0.0239	0.17	0.107794	0.08848086	0.284755835
Barium, total	4/21/2016	2	2	mg/L	0.0197	0.164			
Barium, total	10/7/2016	2	2	mg/L	0.0191	0.257			
Barium, total	4/17/2017	2	2	mg/L	0.0199	0.153			
Barium, total	10/2/2017	2	2	mg/L	0.0176	0.196			
Barium, total	4/17/2018	2	2	mg/L	0.0275	0.299			
Barium, total	10/11/2018	2	2	mg/L	0.0227	0.163			
Barium, total	4/17/2019	2	2	mg/L	0.0339	0.153			
Barium, total	10/7/2019	2	2	mg/L	0.0247	0.234			
Barium, total	4/14/2020	2	2	mg/L	0.0323	0.182			
Barium, total	10/7/2020	2	2	mg/L	0.0321	0.242			
Barium, total	3/5/2021	2	2	mg/L	0.0210	0.114			
Barium, total	9/22/2021	2	2	mg/L	0.0138	0.231			
Barium, total	4/1/2022	2	2	mg/L	0.0788	0.200			
Barium, total	10/3/2022	2	2	mg/L	0.0249	0.184			
Barium, total	4/12/2023	2	2	mg/L	0.0294	0.123			
Barium, total	10/6/2023	2	2	mg/L	0.0147	0.144			
Cadmium, total	10/1/2015	0.005	0.005	mg/L	0.0004	0.0004	0.0004	2.7105E-19	0.0004
Cadmium, total	4/21/2016	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/7/2016	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/17/2017	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/2/2017	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/17/2018	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/11/2018	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/17/2019	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/7/2019	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/14/2020	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/7/2020	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	3/5/2021	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	9/22/2021	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/1/2022	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/3/2022	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	4/12/2023	0.005	0.005	mg/L	0.0004	0.0004			
Cadmium, total	10/6/2023	0.005	0.005	mg/L	0.0004	0.0004			
Cobalt, total	10/1/2015	0.0028	0.00725	mg/L	0.0004	0.0004	0.001915	0.00266528	0.007245709
Cobalt, total	4/21/2016	0.0028	0.00725	mg/L	0.001	0.0004			
Cobalt, total	10/7/2016	0.0028	0.00725	mg/L	0.0004	0.0116			
Cobalt, total	4/17/2017	0.0028	0.00725	mg/L	0.0004	0.0004			
Cobalt, total	10/2/2017	0.0028	0.00725	mg/L	0.0011	0.0004			
Cobalt, total	4/17/2018	0.0021	0.00725	mg/L	0.0034	0.0035			
Cobalt, total	10/11/2018	0.0021	0.00725	mg/L	0.0027	0.0004			
Cobalt, total	4/17/2019	0.0021	0.00725	mg/L	0.0072	0.0004			
Cobalt, total	10/7/2019	0.0021	0.00725	mg/L	0.0021	0.0004			
Cobalt, total	4/14/2020	0.0021	0.00725	mg/L	0.0021	0.0002			
Cobalt, total	10/7/2020	0.0021	0.00725	mg/L	0.0002	0.0083			
Cobalt, total	3/5/2021	0.0021	0.00725	mg/L	0.0012	0.0002			
Cobalt, total	9/22/2021	0.0021	0.00725	mg/L	0.0002	0.0002			
Cobalt, total	4/1/2022	0.0021	0.00725	mg/L	0.0061	0.0002			
Cobalt, total	10/3/2022	0.0021	0.00725	mg/L	0.0031	0.0021			
Cobalt, total	4/12/2023	0.0021	0.00725	mg/L	0.0018	0.0002			
Cobalt, total	10/6/2023	0.0021	0.00725	mg/L	0.0005	<0.0004			
Chromium, total	10/1/2015	0.1	0.1	mg/L	0.004	0.004	0.005138	0.00371658	0.012571391
Chromium, total	4/21/2016	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/7/2016	0.1	0.1	mg/L	0.004	0.0183			
Chromium, total	4/17/2017	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/2/2017	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	4/17/2018	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/11/2018	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	4/17/2019	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/7/2019	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	4/14/2020	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/7/2020	0.1	0.1	mg/L	0.004	0.0138			
Chromium, total	3/5/2021	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	9/22/2021	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	4/1/2022	0.1	0.1	mg/L	0.0186	0.004			
Chromium, total	10/3/2022	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	4/12/2023	0.1	0.1	mg/L	0.004	0.004			
Chromium, total	10/6/2023	0.1	0.1	mg/L	0.004	0.004			

Compound	Date	Statewide Standard IAC-137	Site Specific Standard	Units	MW-1R (upgradient)	MW-12 (upgradient)	Mean	STD	Mean+2STD
Copper, total	10/1/2015	1.3	1.3	mg/L	0.002	0.002	0.00354	0.00385414	0.011248281
Copper, total	4/21/2016	1.3	1.3	mg/L	0.002	0.002			
Copper, total	10/7/2016	1.3	1.3	mg/L	0.002	0.0170			
Copper, total	4/17/2017	1.3	1.3	mg/L	0.002	0.002			
Copper, total	10/2/2017	1.3	1.3	mg/L	0.002	0.002			
Copper, total	4/17/2018	1.3	1.3	mg/L	0.002	0.0054			
Copper, total	10/11/2018	1.3	1.3	mg/L	0.002	0.002			
Copper, total	4/17/2019	1.3	1.3	mg/L	0.002	0.002			
Copper, total	10/7/2019	1.3	1.3	mg/L	0.002	0.002			
Copper, total	4/14/2020	1.3	1.3	mg/L	0.002	0.002			
Copper, total	10/7/2020	1.3	1.3	mg/L	0.002	0.0135			
Copper, total	3/5/2021	1.3	1.3	mg/L	0.002	0.002			
Copper, total	9/22/2021	1.3	1.3	mg/L	0.002	0.002			
Copper, total	4/1/2022	1.3	1.3	mg/L	0.0129	0.002			
Copper, total	10/3/2022	1.3	1.3	mg/L	0.002	0.002			
Copper, total	4/12/2023	1.3	1.3	mg/L	0.0074	0.002			
Copper, total	10/6/2023	1.3	1.3	mg/L	0.002	0.002			
Nickel, total	10/1/2015	0.1	0.1	mg/L	0.0066	0.0052	0.004129	0.00536846	0.014866322
Nickel, total	4/21/2016	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	10/7/2016	0.1	0.1	mg/L	0.002	0.0258			
Nickel, total	4/17/2017	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	10/2/2017	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	4/17/2018	0.1	0.1	mg/L	0.002	0.0075			
Nickel, total	10/11/2018	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	4/17/2019	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	10/7/2019	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	4/14/2020	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	10/7/2020	0.1	0.1	mg/L	0.002	0.0174			
Nickel, total	3/5/2021	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	9/22/2021	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	4/1/2022	0.1	0.1	mg/L	0.0179	0.002			
Nickel, total	10/3/2022	0.1	0.1	mg/L	0.002	0.002			
Nickel, total	4/12/2023	0.1	0.1	mg/L	0.006	0.002			
Nickel, total	10/6/2023	0.1	0.1	mg/L	0.002	0.002			
Lead, total	10/1/2015	0.015	0.015	mg/L	0.002	0.002	0.002597	0.00195846	0.006513986
Lead, total	4/21/2016	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/7/2016	0.015	0.015	mg/L	0.002	0.0106			
Lead, total	4/17/2017	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/2/2017	0.015	0.015	mg/L	0.002	0.002			
Lead, total	4/17/2018	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/11/2018	0.015	0.015	mg/L	0.002	0.002			
Lead, total	4/17/2019	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/7/2019	0.015	0.015	mg/L	0.002	0.002			
Lead, total	4/14/2020	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/7/2020	0.015	0.015	mg/L	0.002	0.0081			
Lead, total	3/5/2021	0.015	0.015	mg/L	0.002	0.002			
Lead, total	9/22/2021	0.015	0.015	mg/L	0.002	0.002			
Lead, total	4/1/2022	0.015	0.015	mg/L	0.0076	0.002			
Lead, total	10/3/2022	0.015	0.015	mg/L	0.002	0.002			
Lead, total	4/12/2023	0.015	0.015	mg/L	0.002	0.002			
Lead, total	10/6/2023	0.015	0.015	mg/L	0.002	0.002			
Vanadium, total	10/1/2015	0.035	0.035	mg/L	0.01	0.01	0.011515	0.00495154	0.021417781
Vanadium, total	4/21/2016	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/7/2016	0.035	0.035	mg/L	0.01	0.0312			
Vanadium, total	4/17/2017	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/2/2017	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	4/17/2018	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/11/2018	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	4/17/2019	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/7/2019	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	4/14/2020	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/7/2020	0.035	0.035	mg/L	0.01	0.0239			
Vanadium, total	3/5/2021	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	9/22/2021	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	4/1/2022	0.035	0.035	mg/L	0.0264	0.01			
Vanadium, total	10/3/2022	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	4/12/2023	0.035	0.035	mg/L	0.01	0.01			
Vanadium, total	10/6/2023	0.035	0.035	mg/L	0.01	0.01			
Zinc, total	10/1/2015	2	2	mg/L	0.01	0.01	0.013844	0.01085753	0.035559181
Zinc, total	4/21/2016	2	2	mg/L	0.01	0.01			
Zinc, total	10/7/2016	2	2	mg/L	0.01	0.0525			
Zinc, total	4/17/2017	2	2	mg/L	0.004	0.004			
Zinc, total	10/2/2017	2	2	mg/L	0.004	0.004			
Zinc, total	4/17/2018	2	2	mg/L	0.004	0.0166			
Zinc, total	10/11/2018	2	2	mg/L	0.0205	0.022			
Zinc, total	4/17/2019	2	2	mg/L	0.0181	0.0089			
Zinc, total	10/7/2019	2	2	mg/L	0.0251	0.0153			
Zinc, total	4/14/2020	2	2	mg/L	0.01	0.01			
Zinc, total	10/7/2020	2	2	mg/L	0.01	0.0406			
Zinc, total	3/5/2021	2	2	mg/L	0.01	0.01			
Zinc, total	9/22/2021	2	2	mg/L	0.01	0.01			
Zinc, total	4/1/2022	2	2	mg/L	0.0411	0.01			
Zinc, total	10/3/2022	2	2	mg/L	0.01	0.01			
Zinc, total	4/12/2023	2	2	mg/L	0.01	0.01			
Zinc, total	10/6/2023	2	2	mg/L	0.01	0.01			

ATTACHMENT D

Water Elevation Data

LUCAS-MONROE SANITARY LANDFILL 68-SDP-1-75C WATER ELEVATIONS											
	MW 1	MW 2	MW 3	MW 5	MW 7	MW 9	MW 10	MW 11	MW 12	PZ 2B	PZ 2A
TOP PVC. ELEV. FT.	1010.71	974.06	969.61	953.51	943.61	937.62	952.28	936.44	1011.48	943.49	943.37
DATE	MW 1R										
	1010.85										
11/29/1994	982.56	DRY	938.94	938.7	936.21	928.32	912.91	923.37	982.48	928.6	930.29
12/20/1994	982.71	960.72	939.69	938.65	936.3	929.22	916.8	925.67	982.68	929.66	930.57
01/31/1995	982.51	958.97	940.61	938.29	935.84	929.68	919.79	925.95	982.96	931.07	930.94
02/16/1995	982.36	959.06	940.15	938.49	936.01	929.48	919.51	925.97	982.84	930.88	930.84
04/17/1995	982.71	960.11	941.21	938.61	937.61	931.54	921.73	925.89	983.1	930.69	-----
05/22/1995	985.02	960.05	940.4	938.56	937.69	932.1	915.5	927.66	986.65	931.49	931.47
07/24/1995	983.47	959.04	938.45	939.99	938.09	932.65	921.31	927.98	986.2	931.71	931.55
08/23/1995	982.87	DRY	938.88	937.51	932.97	927.94	921.83	924.23	984.64	930.88	930.88
09/27/1995	982.65	DRY	938.53	937.17	932.75	927.67	921.21	923.56	983.99	930.47	930.63
10/23/1995	982.61	DRY	939.31	937.45	932.21	928.02	922.43	924.54	983.76	930.49	-----
11/22/1995	982.42	DRY	937.71	937.75	933.57	929.59	912.92	925.84	983.28	930.28	930.37
12/27/1995	982.2	DRY	937.57	937.49	933.45	929.42	912.48	925.81	982.64	930.06	930.23
01/25/1996	982.32	DRY	937.86	937.88	933.77	929.64	919.83	925.85	983.46	930.19	930.49
02/29/1996	982.31	959.56	941.35	938.54	936.36	931.63	917.81	927.13	982.57	930.76	930.83
03/19/1996	981.7	959.4	940.45	937.94	936.06	931.4	922.87	926.96	983.15	930.91	930.96
04/23/1996	982.5	DRY	941.18	937.46	935.17	930.34	923.78	926.34	983.23	931.02	-----
05/31/1996	988.88	960.72	940.57	938.64	936.78	932.59	914.81	927.82	985.56	933.13	-----
06/26/1996	983.69	Dry	940.09	941.19	937.89	932.65	918.98	929.01	986.13	933.45	-----
07/30/1996	982.77	Dry	938.59	940.37	936.37	931.31	917.17	927.87	984.69	931.63	-----
08/30/1996	982.62	Dry	936.4	939.15	931.86	930.06	915.9	926.68	983.85	930.01	-----
09/18/1996	982.45	Dry	938.68	936.75	931.47	925.81	922.48	923.15	983.4	929.84	-----
10/14/1996	982.51	Dry	939.06	937.01	932.8	928.05	922.83	924.79	983.35	929.73	-----
11/27/1996	981.79	Dry	938.55	937.49	932.73	927.84	917.63	924.53	983.03	929.66	-----
12/31/1996	982.44	Dry	940.39	937.35	934.09	929.36	920.33	925.81	983.29	929.69	-----
01/29/1997	982.19	Dry	940.31	937.09	933.83	929.3	920.04	925.73	983.12	929.53	-----
02/26/1997	983.43	Dry	940.69	937.93	934.25	929.64	923.02	926.02	983.22	929.97	-----
03/31/1997	984.14	Dry	942.1	938.49	934.34	930.21	924.3	926.12	984.47	930.6	-----
04/22/1997	987.21	962.06	941.21	939.06	937.81	932.62	924.68	927.74	985.38	930.09	-----
05/23/1997	984.19	961.59	940.27	937.41	935.69	930.89	918.78	926.59	985.71	929.91	-----
06/24/1997	983.75	Dry	939.72	937.26	935.05	930.19	922.16	926.04	985.35	929.79	-----
07/29/1997	982.89	Dry	938.85	924.57	933.14	929.5	920.52	925.48	984.18	929.48	-----
08/26/1997	983.01	Dry	939	924.99	934.32	929.64	921.22	925.69	984.2	929.22	-----
10/23/1997	989.84	Dry	938.59	937.11	933.41	928.97	923.88	925.14	983.78	929.29	-----
11/13/1997	983.15	Dry	936.45	937.45	935.83	929.66	919.57	925.65	985.88	928.7	-----
12/19/1997	984.96	Dry	937.96	938.97	937.29	929.86	921.37	926.22	987.16	928.79	-----
01/20/1998	985.71	Dry	941.2	937.47	935.85	931.47	922.93	926.92	987.07	929.08	-----
02/24/1998	987.62	960.96	941.68	939.14	937.4	932.76	924.29	928.08	987.44	929.8	-----
03/27/1998	991.71	963.64	941.88	939.23	937.64	932.9	925.54	928.41	988.69	929.98	-----
04/17/1998	996.21	962.96	942.01	939.71	938.61	932.82	926.08	928.04	988.98	929.54	-----
05/19/1998	986.61	Dry	940.91	937.58	935.71	931.41	921.21	927.07	988.85	929.45	-----
06/25/1998	990.15	959.53	942.69	937.86	936.4	931.6	923.3	926.48	988.85	929.77	-----
07/27/1998	985.53	Dry	939.69	937.5	934.41	930.64	925.02	925.08	988.02	929.15	-----
08/27/1998	983.73	Dry	938.46	936.62	933.25	929.48	923.44	923.68	986.44	927.39	-----
09/24/1998	985.86	Dry	939.59	937.31	935.07	930.16	925.28	925.42	987.5	928.84	-----
10/19/1998	990.91	960.06	940.41	937.61	937.61	931.82	925.08	927.24	987.36	928.69	-----
11/17/1998	988.96	959.59	940.92	937.54	936.9	931.85	919.16	927.29	988.74	928.61	-----
12/16/1998	986.38	Dry	941.67	937.26	936.76	923.7	921.98	930.25	988.64	928.38	-----
01/14/1999	986.5	Dry	941.71	937.32	936.75	923.92	922.1	930.29	988.7	928.5	-----
04/12/1999	987.21	959.16	942.61	937.26	935.61	931.42	926.38	926.89	988.96	929.64	-----
10/23/1999	985.26	Dry	940.16	936.66	932.01	928.52	925.81	924.94	985.38	928.44	-----
04/26/2000	983.81	Dry	941.11	936.41	933.61	928.92	926.48	925.54	983.28	928.89	-----
10/23/2000	983.41	Dry	940.16	936.51	932.71	928.22	925.38	924.74	983.18	927.89	-----
04/04/2001	989.51	961.36	942.13	938.11	936.81	931.82	925.68	927.34	984.78	928.59	-----
10/19/2001	985.11	960.76	939.73	937.11	934.56	930.37	924.68	926.34	985.58	927.64	-----
04/02/2002	981.81	959.96	941.51	937.51	935.51	930.82	925.18	926.84	986.43	928.24	-----
10/28/2002	984.71	Dry	939.61	936.71	932.41	927.92	924.88	924.16	984.98	927.34	-----
04/01/2003	983.71	Dry	940.51	936.71	934.36	928.72	924.68	925.34	983.18	927.72	-----
10/28/2003	983.06	Dry	938.31	936.21	930.81	924.52	923.88	921.84	982.38	926.34	-----
04/02/2004	985.61	962.16	940.41	939.41	936.81	931.82	924.38	926.69	983.28	927.19	-----
10/19/2004	983.71	Dry	938.51	937.31	933.21	928.62	924.18	924.64	982.88	926.49	-----
04/28/2005	987.81	959.46	940.39	939.14	935.93	930.99	927.08	926.2	984.83	927.43	-----
10/26/2005	983.38	Dry	938.33	936.05	931.06	924.48	924.31	921.65	982.06	926.1	-----
04/25/2006	983.12	959.45	939.67	937.06	934.42	929	925.44	924.45	981.22	927.02	-----
10/17/2006	982.69	Dry	938.39	935.63	930.73	923.64	924.58	921.05	980.71	926.06	-----
04/20/2007	NT	961.16	940.07	938.83	936.32	931.84	925.71	925.91	981.88	926.91	-----
10/19/2007	967.15	960.23	938.38	936.44	933.11	929.01	924.6	924.17	981.65	926.18	-----
04/15/2008	991.84	962.25	940.87	941.24	938.07	932.41	926.9	926.96	984.13	927.09	-----
10/06/2008	985.83	Dry	938.79	936.61	933.96	929.47	926.78	924.69	984.58	926.49	-----
04/09/2009	989.55	961.66	941.01	938.41	936.56	931.62	927.58	926.29	985.43	927.14	-----
10/12/2009	987	960.66	938.78	937.01	934.81	931.02	926.53	925.64	986.53	926.14	-----
04/14/2010	989.25	959.46	940.51	937.51	935.61	931.02	927.48	925.64	988.28	926.69	926.77
10/13/2010	989.6	959.21	939.21	936.71	934.71	929.37	926.38	924.69	989.38	925.99	926.07
04/13/2011	990.1	960.56	941.16	938.26	935.01	930.72	927.63	925.24	988.68	926.89	926.97
10/28/2011	986.95	959.06	938.36	936.31	929.61	924.77	926.13	921.54	986.08	925.49	925.52
04/23/2012	987.4	961.16	940.36	937.96	935.86	931.57	927.38	924.78	986.18	926.25	926.4
10/04/2012	984.5	959.06	938.21	935.91	928.11	922.72	925.28	919.94	983.68	924.99	924.97
04/01/2013	983.85	962.56	940.91	938.26	936.11	931.42	926.78	924.64	983.68	926.19	926.27
10/04/2013	984.15	959.06	937.93	936.61	928.81	922.57	925.58	919.99	983.38	925.19	925.2
04/01/2014	983.15	959.41	939.21	936.46	933.11	929.62	925.48	921.94	982.08	925.39	925.47
10/03/2014	985.05	959.46	937.91	936.81	933.76	931.32	925.88	923.44	984.68	924.94	925.02
04/07/2015	984.35	959.11	939.56	936.61	934.01	928.67	926.28	922.24	984.03	925.69	925.77

LUCAS-MONROE SANITARY LANDFILL 68-SDP-1-75C WATER ELEVATIONS											
	MW 1	MW 2	MW 3	MW 5	MW 7	MW 9	MW 10	MW 11	MW 12	PZ 2B	PZ 2A
TOP PVC. ELEV. FT.	1010.71	974.06	969.61	953.51	943.61	937.62	952.28	936.44	1011.48	943.49	943.37
DATE	MW 1R										
	1010.85										
10/01/2015	984.85	959.66	937.91	936.66	932.51	926.07	925.08	920.84	984.83	924.99	925.02
04/21/2016	986.3	959.19	940.91	936.66	934.39	927.81	928.01	921.64	986.36	926.11	926.03
10/07/2016	984.55	959.06	938.33	936.32	930.09	921.7	926.83	918.99	983.95	925.03	925.11
04/17/2017	985.93	964.34	NR	NR	934.49	931.52	NR	NR	983.08	NR	NR
10/02/2017	983.59	959.41	939.35	936.01	929.84	922.92	927.32	918.36	982.66	925.17	925.13
04/17/2018	984.43	961.81	941.55	937.69	936.04	930.87	928.58	922.44	983.38	925.98	925.96
10/11/2018	993.67	967.02	939.82	942.16	937.71	931.34	927.44	923.69	982.57	924.77	925.03
04/17/2019	986.08	959.76	941.78	937.41	935.32	928.31	929.35	921.66	985.41	926.14	925.92
10/07/2019	985.62	963.75	939.55	939.39	933.94	922.57	927.76	928.66	984.77	925.15	924.91
04/14/2020	988.77	960.99	941.68	938.75	936.37	930.27	929.86	922.81	987.45	925.88	925.63
10/07/2020	985.48	959.01	939.89	935.99	929.03	920.35	927.48	917.54	984.8	924.67	924.65
03/05/2021	986.45	964.59	941.39	940.88	936.56	929.09	928.13	922.26	984.15	925.19	923.94
09/22/2021	985.37	959.01	938.82	936.11	930.62	920.8	928.07	917.88	984.64	924.54	924.56
4/1/2022	988.97	963.06	941.72	939.36	936.75	929.98	928.88	922.21	985.33	925.54	925.52
10/3/2022	984.56	959.25	938.8	935.71	928.99	920.17	927.46	916.74	983.73	924.44	924.43
04/12/2023	985.71	960.51	941.19	937.28	935.29	928.13	929.33	920.24	984.84	925.39	925.16
10/06/2023	983.45	958.76	937.12	935.61	927.19	919.82	926.93	915.64	982.49	923.81	923.81

ATTACHMENT E

Explosive Gas Monitoring Results

2023 - Gas Monitoring Results
LUCAS-MONROE SANITARY LANDFILL
Permit #68-SDP-1-75C

4/12/2023

Monitoring Point	Top of Casing Elevation	Top of Screen Elevation	Depth Water (feet)	Water Elevation	Exposed Screen (feet)*	%LEL
Subsurface						
GP-1 (near MW-1R)	N/A	N/A	N/A	N/A	5.0	0
MW-1R	1010.85	948.85	25.14	985.71	-36.86	0
GP-2 (near MW-7/PZ-2B)	N/A	N/A	N/A	N/A	5.0	0
MW-7	943.61	930.5	8.32	935.29	-4.79	0
PZ-2B	943.49	913.6	18.1	925.39	-11.79	0
GP-3 (near MW-9/MW-11)	N/A	N/A	N/A	N/A	5.0	0
MW-9	937.62	924.1	9.49	928.13	-4.03	0
MW-11	936.44	898.4	16.20	920.24	-21.84	0
MW-2	974.06	964.7	13.55	960.51	4.19	0
MW-3	969.61	917.8	28.42	941.19	-23.39	0
MW-5	953.51	940.3	16.23	937.28	3.02	0
MW-10	952.28	897.6	22.95	929.33	-31.73	0
MW-12	1011.48	974.2	26.64	984.84	-10.64	0
Remedial Vent Trench						
Vent 1 - North	N/A	N/A	N/A	N/A	N/A	67.3
Vent 2 - Middle	N/A	N/A	N/A	N/A	N/A	43.7
Vent 3 - South	N/A	N/A	N/A	N/A	N/A	0
Ambient Air						
Perimeter	N/A	N/A	N/A	N/A	N/A	0

NR - No Record

* Negative values indicate that the screen is submerged.

2023 - Gas Monitoring Results
LUCAS-MONROE SANITARY LANDFILL
Permit #68-SDP-1-75C

10/6/2023

Monitoring Point	Top of Casing Elevation	Top of Screen Elevation	Depth Water (feet)	Water Elevation	Exposed Screen (feet)*	%LEL
Subsurface						
GP-1 (near MW-1R)	N/A	N/A	N/A	N/A	5.0	0
MW-1R	1010.85	948.85	27.4	983.45	-34.6	0
GP-2 (near MW-7/PZ-2B)	N/A	N/A	N/A	N/A	5.0	0
MW-7	943.61	930.5	16.42	927.19	3.31	0
PZ-2B	943.49	913.6	19.68	923.81	-10.21	0
GP-3 (near MW-9/MW-11)	N/A	N/A	N/A	N/A	5.0	0
MW-9	937.62	924.1	17.8	919.82	4.28	0
MW-11	936.44	898.4	20.80	915.64	-17.24	0
MW-2	974.06	964.7	15.3	958.76	5.94	0
MW-3	969.61	917.8	32.49	937.12	-19.32	0
MW-5	953.51	940.3	17.9	935.61	4.69	0
MW-10	952.28	897.6	25.35	926.93	-29.33	0
MW-12	1011.48	974.2	28.99	982.49	-8.29	0
Remedial Vent Trench						
Vent 1 - North	N/A	N/A	N/A	N/A	N/A	0
Vent 2 - Middle	N/A	N/A	N/A	N/A	N/A	2.6
Vent 3 - South	N/A	N/A	N/A	N/A	N/A	5.2
Ambient Air						
Perimeter	N/A	N/A	N/A	N/A	N/A	0

NR - No Record

* Negative values indicate that the screen is submerged.