2024 Annual Leachate Report

Walter Scott Jr. Energy Center Monofill
Council Bluffs, Iowa
Permit 78-SDP-26-06P

MidAmerican Energy Company

January 31, 2025

→ The Power of Commitment

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1. Introduction

The MidAmerican Energy Company (MidAmerican) Walter Scott Jr. Energy Center (WSEC) Coal Combustion Residual (CCR) Monofill is located in the southwest quarter of Section 31, Township 74 North, and Range 43 West; the northwest quarter of Section 6, Township 73 North, and Range 43 West; and the northeast quarter of Section 1, Township 73 North, and Range 44 West in Pottawattamie and Mills counties, Iowa. The location of the site is depicted in Figure 1.1. Figure 1.2 depicts pertinent site features and locations of monitoring wells present at the Monofill.

The Monofill is permitted under Iowa Department of Natural Resources (IDNR) Operating Permit No. 78-SDP-26-06P issued May 2, 2007, with subsequent amendments. A renewed operating permit was issued January 12, 2018, and incorporated all amendments. The site was developed as a Monofill in 2007 (Cell 1) and began receiving CCR in September 2007. The Monofill was constructed with a composite liner system including a 2-foot compacted clay liner and 60-mil high density polyethylene (HDPE) plastic liner. Additional cells were added after 2007 and include Cells 2, 3S, and 3N (2008), Cell 4 (2010), Cell 5 (2011), Cell 6 (2012), Cell 7 (2016), Cell 8 (2020), and Cell 9 (2022).

GHD prepared this Leachate Report to document leachate management activities for the WSEC CCR Monofill. This report summarizes the leachate control system performance and leachate analytical data.

2. Leachate Control System Performance Evaluation and Sampling

The Monofill has a leachate collection system with a composite liner, which meets the requirements of Iowa Administrative Code (IAC) 567—113.7(5)a(1) and a leachate collection system, which meets the requirements of IAC 567—113.7(5)b. The leachate collection system consists of leachate collection media (sand or bottom ash), 8-inch diameter HDPE conveyance pipes, pipe bedding, and a geocomposite drainage liner. Leachate flows toward a collection sump in each cell. Each sump includes an 18-inch diameter recovery pipe (riser pipe) from which leachate is pumped into a lined holding pond. The system automatically turns on the applicable sump pumps before levels reach 12 inches above the liner for permit compliance. MidAmerican's contractor pumps the collected leachate from the leachate pond into tanker trucks. The trucks then transport the leachate to the active fill areas where the leachate is used within the lined area (i.e., the area underlain with the geocomposite drainage liner) of the Monofill for dust control and to aid in solidification of CCR. As a backup disposal option for excess leachate, MidAmerican entered into a contractual agreement with the City of Council Bluffs Water Pollution Control Plant (CBWPCP), located immediately north of the Monofill, to accept excess leachate. Leachate is not used for dust suppression outside of the lined area of the Monofill. Groundwater from a water-supply well is used for dust control on roads outside of the lined Monofill area.

2.1 Volume of Leachate Collected

The volume of leachate collected and removed from the leachate pond was recorded by the leachate pond load out flow system. Between January 1, 2024, and December 31, 2024, approximately 14,098,337 gallons were removed from the leachate pond, loaded into trucks, and used for dust control and CCR solidification within the lined Monofill area. During the 2024 reporting period, the facility did not transport excess leachate to the CBWPCP for disposal. The 2024 monthly totals of leachate used for dust control and CCR solidification are summarized in Table 1.

2.2 Leachate Head Measurements

In 2010, MidAmerican constructed an automated leachate handling/pumping system. Prior to the use of this automated system, leachate levels were measured using an electronic water level meter. The current automated system includes dedicated pressure transducers for measurement of leachate head in each cell. This system allows MidAmerican to automatically monitor and record leachate levels in each cell (in inches) and automatically turn on the applicable sump pumps before levels reach 12 inches above the liner. The system is also equipped with a series of alarms that will alert MidAmerican if a component of the system is not functioning properly. Monthly leachate levels are summarized in Table 2. During the period from January 2024 through December 2024, leachate levels did not exceed 12 inches above the liner.

2.3 Leachate Sampling

During the monitoring events conducted on April 2, 2024, and October 2, 2024, leachate samples were collected from each leachate lift station (Leachate Lift Station #1 through Leachate Lift Station #3). The locations of the three leachate lift stations are depicted on Figure 1.2. Leachate sample collection was conducted via bailer. WSEC personnel operated the leachate pump system at each leachate lift station prior to sample collection. The stagnant leachate was removed from the sump at each lift station with fresh leachate pumped from cells into the sump during each monitoring event. Physical and chemical parameters of the leachate (temperature, pH, specific conductance, oxidation-reduction potential [ORP], dissolved oxygen [DO], and turbidity) were measured using an Aquatroll 600 multiparameter probe during sample collection from each of the leachate sample locations. The leachate sample field parameters are summarized in Table 3.

Leachate samples were collected in laboratory-supplied containers and submitted to Eurofins Environment Testing North Central, LLC for analysis of Appendix III (detection monitoring) and Appendix IV (assessment monitoring) constituents. Laboratory analytical results are summarized in Table 4 for the leachate samples. The leachate sample collection records and the laboratory analytical reports for the leachate samples are provided in Appendix A and Appendix B, respectively.

3. Leachate Monitoring Results

The following constituents were analyzed in the leachate samples collected during the 2024 reporting period:

- **Boron**: Boron is a Detection Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, boron concentrations in the leachate samples ranged from 1.44 to 3.03 milligrams per liter (mg/L).
- **Calcium**: Calcium is a Detection Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of calcium concentrations in leachate samples was from 22.5 to 126 mg/L.
- **Chloride**: Chloride is a Detection Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the chloride concentrations in the leachate samples ranged from 154 to 586 mg/L.
- **Fluoride**: Fluoride is both a Detection Monitoring and Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, there were no detections of fluoride in leachate samples.
- **pH**: pH is a Detection Monitoring constituent under the Federal CCR rule. The laboratory pH measurements during 2024 ranged from 9.8 to 12.1 standard units.
- **Sulfate**: Sulfate is a Detection Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the sulfate concentrations in the leachate samples ranged from 1,720 to 5,570 mg/L.
- **Total Dissolved Solids (TDS)**: TDS is a Detection Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of TDS values measured in leachate samples was from 3,550 to 10,200 mg/L.

- **Antimony:** Antimony is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, there were no detections of antimony in leachate samples.
- **Arsenic:** Arsenic is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of arsenic concentrations in leachate samples was from 0.00832 to 0.0533 mg/L.
- **Barium:** Barium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the barium concentrations in the leachate samples ranged from 0.0249 to 0.0471 mg/L.
- **Beryllium:** Beryllium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, beryllium was not detected in any of the leachate samples (RL of 0.001 mg/L).
- **Cadmium:** Cadmium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of cadmium concentrations in the leachate samples was from 0.000211 to 0.00157 mg/L.
- **Chromium:** Chromium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the chromium concentrations in leachate samples ranged from not detected at an RL of 0.005 mg/L to 0.0272 mg/L.
- **Cobalt:** Cobalt is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of cobalt concentrations in the leachate samples was from not detected at a RL of 0.0005 mg/L to 0.00224 mg/L.
- **Lead:** Lead is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, lead was not detected in any of the leachate samples (RL of 0.0005 mg/L).
- **Lithium:** Lithium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of lithium concentrations in the leachate samples was non-detect (RL of 0.01 mg/L) to 0.112 mg/L.
- **Mercury:** Mercury is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, mercury was not detected in any of the leachate samples (RL of 0.0002 mg/L).
- **Molybdenum:** Molybdenum is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of molybdenum concentrations in the leachate samples was 1.26 to 8.46 mg/L.
- **Radium-226 & 228 (combined):** Radium-226 & 228 (combined) is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of Radium-226 & 228 (combined) concentrations in the leachate samples was non-detect (RL range of 0.590-1.13 picocuries per liter) to 0.712 picocuries per liter.
- **Selenium:** Selenium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of selenium concentrations in leachate samples was 0.103 to 0.423 mg/L.
- **Thallium:** Thallium is an Assessment Monitoring constituent under the Federal CCR rule. During the 2024 reporting period, the range of thallium concentrations was not detected at an RL of 0.001 mg/L to 0.00483 mg/L.

4. Recommendations

This report documents leachate management and monitoring conducted at the Monofill during the 2024 reporting period.

During 2024, the leachate control and management system at the site appeared to be functioning properly. Approximately 14,098,337 gallons were recovered during the period from January 2024 through December 2024 via the leachate collection system and applied for dust suppression and CCR solidification. No changes to the current operating and maintenance protocols for the leachate control system are proposed or necessary.

During 2025, leachate samples will be collected concurrently with semiannual groundwater monitoring required under the Federal CCR rule. During 2025, the semiannual leachate samples will be analyzed for the Appendix III and Appendix IV constituents.

Tables

Table 1

Leachate Use Summary
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Month	End of Month Totalizer Readings (gallons)	Leachate Used for Dust Control (gallons)	Leachate Hauled to POTW (gallons)
Jan-2024	27,372,890	0	0
Feb-2024	27,386,520	13,630	0
Mar-2024	28,025,510	638,990	0
Apr-2024	28,581,680	556,170	0
May-2024	29,055,120	473,440	0
Jun-2024	30,607,710	1,552,590	0
Jul-2024	223,680	2,506,975	0
Aug-2024	2,799,604	2,575,924	0
Sep-2024	5,118,388	2,318,784	0
Oct-2024	8,419,121	3,300,733	0
Nov-2024	8,513,716	94,595	0
Dec-2024	8,580,222	66,506	0
Totals		**14,098,337**	**0**

Note:
POTW = Publicly Owned Treatment Works (City of Council Bluffs Water Pollution Control Plant).
Totalizer was reset during repairs in July 2024.

Table 2

Leachate Elevation Measurements
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Month/Year	Cell Number	Leachate Level Measurement (inches above transducer)	Top of Liner Level (inches above transducer)	Leachate Level Above Top of Liner (inches)	In Compliance (Yes/No)
Jan-2024	Cell 1	12.0	15.2	-3.2	Yes
Jan-2024	Cell 2	15.0	12.7	2.3	Yes
Jan-2024	Cell 3N	11.0	12.9	-1.9	Yes
Jan-2024	Cell 3S	18.0	14.6	3.4	Yes
Jan-2024	Cell 4N	24.0	18.7	5.3	Yes
Jan-2024	Cell 4S	12.0	18.7	-6.7	Yes
Jan-2024	Cell 5	24.0	18.7	5.3	Yes
Jan-2024	Cell 6N	10.0	18.7	-8.7	Yes
Jan-2024	Cell 6S	18.0	18.7	-0.7	Yes
Jan-2024	Cell 7N	30.0	18.7	11.3	Yes
Jan-2024	Cell 7S	28.0	18.7	9.3	Yes
Jan-2024	Cell 8S	24.0	18.7	5.3	Yes
Jan-2024	Cell 8C	25.0	18.7	6.3	Yes
Jan-2024	Cell 8N	18.0	18.7	-0.7	Yes
Jan-2024	Cell 9W	21.0	18.7	2.3	Yes
Jan-2024	Cell 9E	24.0	18.7	5.3	Yes
Feb-2024	Cell 1	15.0	15.2	-0.2	Yes
Feb-2024	Cell 2	13.0	12.7	0.3	Yes
Feb-2024	Cell 3N	5.0	12.9	-7.9	Yes
Feb-2024	Cell 3S	0.0	14.6	-14.6	Yes
Feb-2024	Cell 4N	20.0	18.7	1.3	Yes
Feb-2024	Cell 4S	10.0	18.7	-8.7	Yes
Feb-2024	Cell 5	24.0	18.7	5.3	Yes
Feb-2024	Cell 6N	12.0	18.7	-6.7	Yes
Feb-2024	Cell 6S	11.0	18.7	-7.7	Yes
Feb-2024	Cell 7N	30.0	18.7	11.3	Yes
Feb-2024	Cell 7S	29.0	18.7	10.3	Yes
Feb-2024	Cell 8S	22.0	18.7	3.3	Yes
Feb-2024	Cell 8C	26.0	18.7	7.3	Yes
Feb-2024	Cell 8N	16.0	18.7	-2.7	Yes
Feb-2024	Cell 9W	22.0	18.7	3.3	Yes
Feb-2024	Cell 9E	17.0	18.7	-1.7	Yes
Mar-2024	Cell 1	14.0	15.2	-1.2	Yes
Mar-2024	Cell 2	12.0	12.7	-0.7	Yes
Mar-2024	Cell 3N	17.0	12.9	4.1	Yes
Mar-2024	Cell 3S	9.0	14.6	-5.6	Yes
Mar-2024	Cell 4N	22.0	18.7	3.3	Yes
Mar-2024	Cell 4S	11.0	18.7	-7.7	Yes
Mar-2024	Cell 5	21.0	18.7	2.3	Yes
Mar-2024	Cell 6N	18.0	18.7	-0.7	Yes
Mar-2024	Cell 6S	10.0	18.7	-8.7	Yes
Mar-2024	Cell 7N	25.0	18.7	6.3	Yes
Mar-2024	Cell 7S	30.0	18.7	11.3	Yes
Mar-2024	Cell 8S	23.0	18.7	4.3	Yes
Mar-2024	Cell 8C	25.0	18.7	6.3	Yes
Mar-2024	Cell 8N	23.0	18.7	4.3	Yes
Mar-2024	Cell 9W	19.0	18.7	0.3	Yes
Mar-2024	Cell 9E	25.0	18.7	6.3	Yes

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Apr-2024	Cell 1	12.0	15.2	-3.2	Yes
Apr-2024	Cell 2	11.0	12.7	-1.7	Yes
Apr-2024	Cell 3N	10.0	12.9	-2.9	Yes
Apr-2024	Cell 3S	15.0	14.6	0.4	Yes
Apr-2024	Cell 4N	10.0	18.7	-8.7	Yes
Apr-2024	Cell 4S	11.0	18.7	-7.7	Yes
Apr-2024	Cell 5	20.0	18.7	1.3	Yes
Apr-2024	Cell 6N	12.0	18.7	-6.7	Yes
Apr-2024	Cell 6S	15.0	18.7	-3.7	Yes
Apr-2024	Cell 7N	25.0	18.7	6.3	Yes
Apr-2024	Cell 7S	28.0	18.7	9.3	Yes
Apr-2024	Cell 8S	17.0	18.7	-1.7	Yes
Apr-2024	Cell 8C	27.0	18.7	8.3	Yes
Apr-2024	Cell 8N	13.0	18.7	-5.7	Yes
Apr-2024	Cell 9W	22.0	18.7	3.3	Yes
Apr-2024	Cell 9E	18.0	18.7	-0.7	Yes
May-2024	Cell 1	7.0	15.2	-8.2	Yes
May-2024	Cell 2	9.6	12.7	-3.1	Yes
May-2024	Cell 3N	15.2	12.9	2.3	Yes
May-2024	Cell 3S	13.1	14.6	-1.5	Yes
May-2024	Cell 4N	15.2	18.7	-3.5	Yes
May-2024	Cell 4S	12.0	18.7	-6.7	Yes
May-2024	Cell 5	23.0	18.7	4.3	Yes
May-2024	Cell 6N	12.5	18.7	-6.2	Yes
May-2024	Cell 6S	16.8	18.7	-1.9	Yes
May-2024	Cell 7N	23.6	18.7	4.9	Yes
May-2024	Cell 7S	27.0	18.7	8.3	Yes
May-2024	Cell 8S	21.0	18.7	2.3	Yes
May-2024	Cell 8C	24.0	18.7	5.3	Yes
May-2024	Cell 8N	24.0	18.7	5.3	Yes
May-2024	Cell 9W	22.0	18.7	3.3	Yes
May-2024	Cell 9E	19.0	18.7	0.3	Yes
Jun-2024	Cell 1	15.0	15.2	-0.2	Yes
Jun-2024	Cell 2	16.0	12.7	3.3	Yes
Jun-2024	Cell 3N	15.0	12.9	2.1	Yes
Jun-2024	Cell 3S	16.0	14.6	1.4	Yes
Jun-2024	Cell 4N	20.0	18.7	1.3	Yes
Jun-2024	Cell 4S	18.0	18.7	-0.7	Yes
Jun-2024	Cell 5	23.0	18.7	4.3	Yes
Jun-2024	Cell 6N	20.0	18.7	1.3	Yes
Jun-2024	Cell 6S	16.0	18.7	-2.7	Yes
Jun-2024	Cell 7N	25.0	18.7	6.3	Yes
Jun-2024	Cell 7S	28.0	18.7	9.3	Yes
Jun-2024	Cell 8S	21.0	18.7	2.3	Yes
Jun-2024	Cell 8C	18.0	18.7	-0.7	Yes
Jun-2024	Cell 8N	19.0	18.7	0.3	Yes
Jun-2024	Cell 9W	18.0	18.7	-0.7	Yes
Jun-2024	Cell 9E	22.0	18.7	3.3	Yes

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Jul-2024	Cell 1	15.0	15.2	-0.2	Yes
Jul-2024	Cell 2	16.0	12.7	3.3	Yes
Jul-2024	Cell 3N	18.0	12.9	5.1	Yes
Jul-2024	Cell 3S	17.0	14.6	2.4	Yes
Jul-2024	Cell 4N	15.0	18.7	-3.7	Yes
Jul-2024	Cell 4S	22.0	18.7	3.3	Yes
Jul-2024	Cell 5	23.0	18.7	4.3	Yes
Jul-2024	Cell 6N	20.0	18.7	1.3	Yes
Jul-2024	Cell 6S	16.0	18.7	-2.7	Yes
Jul-2024	Cell 7N	22.0	18.7	3.3	Yes
Jul-2024	Cell 7S	21.0	18.7	2.3	Yes
Jul-2024	Cell 8S	16.0	18.7	-2.7	Yes
Jul-2024	Cell 8C	27.0	18.7	8.3	Yes
Jul-2024	Cell 8N	19.0	18.7	0.3	Yes
Jul-2024	Cell 9W	20.0	18.7	1.3	Yes
Jul-2024	Cell 9E	12.0	18.7	-6.7	Yes
Aug-2024	Cell 1	18.0	15.2	2.8	Yes
Aug-2024	Cell 2	19.0	12.7	6.3	Yes
Aug-2024	Cell 3N	13.0	12.9	0.1	Yes
Aug-2024	Cell 3S	9.0	14.6	-5.6	Yes
Aug-2024	Cell 4N	22.0	18.7	3.3	Yes
Aug-2024	Cell 4S	20.0	18.7	1.3	Yes
Aug-2024	Cell 5	23.0	18.7	4.3	Yes
Aug-2024	Cell 6N	10.0	18.7	-8.7	Yes
Aug-2024	Cell 6S	15.0	18.7	-3.7	Yes
Aug-2024	Cell 7N	18.0	18.7	-0.7	Yes
Aug-2024	Cell 7S	21.0	18.7	2.3	Yes
Aug-2024	Cell 8S	21.0	18.7	2.3	Yes
Aug-2024	Cell 8C	17.0	18.7	-1.7	Yes
Aug-2024	Cell 8N	30.0	18.7	11.3	Yes
Aug-2024	Cell 9W	16.0	18.7	-2.7	Yes
Aug-2024	Cell 9E	19.0	18.7	0.3	Yes
Sep-2024	Cell 1	17.0	15.2	1.8	Yes
Sep-2024	Cell 2	18.0	12.7	5.3	Yes
Sep-2024	Cell 3N	13.0	12.9	0.1	Yes
Sep-2024	Cell 3S	22.0	14.6	7.4	Yes
Sep-2024	Cell 4N	14.0	18.7	-4.7	Yes
Sep-2024	Cell 4S	24.0	18.7	5.3	Yes
Sep-2024	Cell 5	23.0	18.7	4.3	Yes
Sep-2024	Cell 6N	20.0	18.7	1.3	Yes
Sep-2024	Cell 6S	14.0	18.7	-4.7	Yes
Sep-2024	Cell 7N	25.0	18.7	6.3	Yes
Sep-2024	Cell 7S	30.0	18.7	11.3	Yes
Sep-2024	Cell 8S	19.0	18.7	0.3	Yes
Sep-2024	Cell 8C	27.0	18.7	8.3	Yes
Sep-2024	Cell 8N	13.0	18.7	-5.7	Yes
Sep-2024	Cell 9W	16.0	18.7	-2.7	Yes
Sep-2024	Cell 9E	13.0	18.7	-5.7	Yes

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Oct-2024	Cell 1	15.0	15.2	-0.2	Yes
Oct-2024	Cell 2	12.0	12.7	-0.7	Yes
Oct-2024	Cell 3N	18.0	12.9	5.1	Yes
Oct-2024	Cell 3S	17.0	14.6	2.4	Yes
Oct-2024	Cell 4N	25.0	18.7	6.3	Yes
Oct-2024	Cell 4S	21.0	18.7	2.3	Yes
Oct-2024	Cell 5	24.0	18.7	5.3	Yes
Oct-2024	Cell 6N	19.0	18.7	0.3	Yes
Oct-2024	Cell 6S	20.0	18.7	1.3	Yes
Oct-2024	Cell 7N	21.0	18.7	2.3	Yes
Oct-2024	Cell 7S	25.0	18.7	6.3	Yes
Oct-2024	Cell 8S	11.0	18.7	-7.7	Yes
Oct-2024	Cell 8C	21.0	18.7	2.3	Yes
Oct-2024	Cell 8N	11.0	18.7	-7.7	Yes
Oct-2024	Cell 9W	13.0	18.7	-5.7	Yes
Oct-2024	Cell 9E	24.0	18.7	5.3	Yes
Nov-2024	Cell 1	2.0	15.2	-13.2	Yes
Nov-2024	Cell 2	13.0	12.7	0.3	Yes
Nov-2024	Cell 3N	15.0	12.9	2.1	Yes
Nov-2024	Cell 3S	14.0	14.6	-0.6	Yes
Nov-2024	Cell 4N	14.0	18.7	-4.7	Yes
Nov-2024	Cell 4S	16.0	18.7	-2.7	Yes
Nov-2024	Cell 5	22.0	18.7	3.3	Yes
Nov-2024	Cell 6N	21.0	18.7	2.3	Yes
Nov-2024	Cell 6S	20.0	18.7	1.3	Yes
Nov-2024	Cell 7N	21.0	18.7	2.3	Yes
Nov-2024	Cell 7S	27.0	18.7	8.3	Yes
Nov-2024	Cell 8S	15.0	18.7	-3.7	Yes
Nov-2024	Cell 8C	23.0	18.7	4.3	Yes
Nov-2024	Cell 8N	18.0	18.7	-0.7	Yes
Nov-2024	Cell 9W	23.0	18.7	4.3	Yes
Nov-2024	Cell 9E	23.0	18.7	4.3	Yes
Dec-2024	Cell 1	19.0	15.2	3.8	Yes
Dec-2024	Cell 2	18.0	12.7	5.3	Yes
Dec-2024	Cell 3N	14.0	12.9	1.1	Yes
Dec-2024	Cell 3S	14.0	14.6	-0.6	Yes
Dec-2024	Cell 4N	23.0	18.7	4.3	Yes
Dec-2024	Cell 4S	25.0	18.7	6.3	Yes
Dec-2024	Cell 5	23.0	18.7	4.3	Yes
Dec-2024	Cell 6N	20.0	18.7	1.3	Yes
Dec-2024	Cell 6S	17.0	18.7	-1.7	Yes
Dec-2024	Cell 7N	22.0	18.7	3.3	Yes
Dec-2024	Cell 7S	26.0	18.7	7.3	Yes
Dec-2024	Cell 8S	20.0	18.7	1.3	Yes
Dec-2024	Cell 8C	25.0	18.7	6.3	Yes
Dec-2024	Cell 8N	18.0	18.7	-0.7	Yes
Dec-2024	Cell 9W	15.0	18.7	-3.7	Yes
Dec-2024	Cell 9E	22.0	18.7	3.3	Yes

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Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Month/Year	Cell Number	Leachate Level Measurement (inches above transducer)	Top of Liner Level (inches above transducer)	Leachate Level Above Top of Liner (inches)	In Compliance (Yes/No)

Notes:
The Monofill has been designed with a composite liner system with leachate collection. Leachate is composed of water that percolates through the coal combustion residual (CCR) in the Monofill and may include water soluble compounds from the CCR. Leachate is managed to protect soils, surface water, and groundwater and to maintain the integrity of the composite liner system by preventing a significant accumulation of standing leachate on the liner (e.g. less than 12 inches of head on the liner).

The maximum leachate level allowed is 12 inches above the following measurements. Cell 1 - Top of the Liner Level (TOLL) = 15.2 inches; Cell 2 TOLL = 12.7 inches; Cell 3N TOLL = 12.9 inches; Cell 3S TOLL = 14.6 inches; Cell 4N TOLL = 18.7 inches; Cell 4S TOLL = 18.7 inches; Cell 5 TOLL = 18.7 inches; Cell 6N TOLL = 18.7 inches; Cell 6S TOLL = 18.7 inches; Cell 7N TOLL = 18.7 inches; Cell 7S TOLL = 18.7 inches; Cell 8S TOLL = 18.7 inches; Cell 8C TOLL = 18.7 inches; Cell 8N TOLL = 18.7 inches; Cell 9W TOLL = 18.7 inches; Cell 9E TOLL = 18.7 inches.

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	pH, Field (s.u.)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	10.94	10.39	
3/18/2016	10.03	10.73	
5/18/2016	11.86	12.19	
7/20/2016	11.33	11.93	
10/6/2016	10.63	12.05	
1/31/2017	11.66	11.43	
7/12/2017	9.92	11.71	
8/16/2017	9.68	10.93	8.93
10/10/2017	10.10	11.28	11.58
5/3/2018	9.84	9.81	9.05
10/10/2018	11.54	10.04	10.92
4/18/2019	11.46	10.42	12.03
10/30/2019	12.91	9.83	12.83
4/21/2020	12.39	11.21	12.35
10/14/2020	11.52	10.96	11.51
4/21/2021	12.54	12.76	12.72
10/28/2021	11.11	11.47	11.69
4/29/2022	10.96	10.72	12.41
10/10/2022	11.18	10.00	11.45
4/25/2023	10.73	10.43	11.62
10/4/2023	11.48	9.93	11.62
4/2/2024	11.04	9.56	11.55
10/2/2024	11.7	11.19	11.97

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Temperature (°C)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	12.83	14.99	
3/18/2016	12.47	13.81	
5/18/2016	17.49	19.09	
7/20/2016	21.27	22.17	
10/6/2016	15.97	17.40	
1/31/2017	10.05	12.63	
7/12/2017	20.51	20.28	
8/16/2017	19.66	19.46	20.65
10/10/2017	13.03	13.85	15.62
5/3/2018	12.90	15.07	14.48
10/10/2018	16.34	14.03	14.28
4/18/2019	13.69	15.42	13.46
10/30/2019	8.65	12.43	14.10
4/21/2020	13.78	15.79	15.46
10/14/2020	17.60	18.26	19.84
4/21/2021	12.71	12.10	12.56
10/28/2021	14.66	15.44	15.38
4/29/2022	14.12	16.03	17.18
10/10/2022	18.78	19.05	19.19
4/25/2023	11.97	15.31	13.79
10/4/2023	18.23	18.41	17.79
4/2/2024			
10/2/2024	17.77	17.87	17.53

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
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Council Bluffs, Iowa

Date	Conductivity (mS/cm)		
	Lift Station #1	Lift Station #2	Lift Station #3
4/12/2014	7.51	11.1	
3/18/2016	9.87	14.3	
5/18/2016	7.84	16.6	
7/20/2016	6.14	15.2	
10/6/2016	9.47	16.3	
1/31/2017	12.0	15.3	
7/12/2017	9.18	13.8	
8/16/2017	8.15	12.2	4.19
10/10/2017	9.23	14.0	10.9
5/3/2018	9.55	9.86	4.61
10/10/2018	8.73		8.15
4/18/2019	8.86	11.9	8.25
10/30/2019	10.8	9.95	7.93
4/21/2020	9.67	15.20	11.5
10/14/2020	10.1	15.00	7.54
4/21/2021	8.36	12.30	11.9
10/28/2021	8.33	11.80	7.08
4/29/2022		12.70	
10/10/2022	9.37	13.94	8.85
4/25/2023	14.24	17.01	10.74
10/4/2023	9.54	14.22	8.75
4/2/2024	9.27	13.57	5.54
10/2/2024	10.77	12.52	9.36

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Date	Turbidity (NTU)		
	Lift Station #1	Lift Station #2	Lift Station #3
4/12/2014	3.5	0.0	
3/18/2016	0.0	4.4	
5/18/2016	0.0	0.0	
7/20/2016	3.3	0.6	
10/6/2016	0.0	0.0	
1/31/2017	0.0	0.0	
7/12/2017	0.0	0.0	
8/16/2017	0.0	0.0	0.0
10/10/2017	18.3	30.9	39.4
5/3/2018	2.4	0.9	1.8
10/10/2018	2.9	2.2	2.8
4/18/2019	17.9	0.0	15.6
10/30/2019	201	12.4	45.7
4/21/2020	0.0	0.0	469
10/14/2020	12.4	0.2	11.7
4/21/2021	19.7	5.7	171
10/28/2021	30.4	41.3	37.4
4/29/2022	0.4	9.1	0.0
10/10/2022	22.1	7.3	4.5
4/25/2023	22.2	2.2	5.9
10/4/2023	12.9	0.0	0.0
4/2/2024	0.0	0.3	0.0
10/2/2024	4.8	1.5	14.6

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Oxidation-Reduction Potential (mV)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	126	133	
3/18/2016	108	-230	
5/18/2016	74	28	
7/20/2016	-13	-66	
10/6/2016	58	50	
1/31/2017	16	-27	
7/12/2017	61	6	
8/16/2017	55	32	115
10/10/2017	90	53	51
5/3/2018	118	140	137
10/10/2018	-58	24	-32
4/18/2019	19	2	-42
10/30/2019	-151	-150	-51
4/21/2020	-46	-16	-103
10/14/2020	-1	17	-3
4/21/2021	1	-34	-34
10/28/2021	49	-6	0
4/29/2022	-9	-10	-75
10/10/2022	161	207	27
4/25/2023	211	198	179
10/4/2023	58	157	9.2
4/2/2024	-156	-103	-95.3
10/2/2024	-127	-198	-139.7

Leachate Physical and Chemical Parameters
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

	Dissolved Oxygen (mg/L)		
Date	**Lift Station #1**	**Lift Station #2**	**Lift Station #3**
4/12/2014	10.50	5.54	
3/18/2016	5.44	6.43	
5/18/2016	4.52	2.40	
7/20/2016	1.73	1.23	
10/6/2016	2.75	5.32	
1/31/2017	3.51	4.88	
7/12/2017	2.93	3.05	
8/16/2017	0.82	0.83	6.64
10/10/2017	4.81	5.08	3.70
5/3/2018	5.05	6.20	6.85
10/10/2018	4.53	3.94	0.00
4/18/2019	0.83	0.62	0.58
10/30/2019	6.14	6.42	5.97
4/21/2020	5.34	2.38	1.77
10/14/2020	0.65	4.64	6.47
4/21/2021	2.96	0.56	0.70
10/28/2021	2.21	0.86	5.34
4/29/2022	3.02	0.80	5.74
10/10/2022	0.50	0.04	1.83
4/25/2023	5.56	2.46	5.59
10/4/2023	4.34	3.09	2.95
4/2/2024	3.35	5.71	9.36
10/2/2024	3.19	2.65	2.16

Notes:
Parameters measured using a multiparameter probe.
°C = Degrees Celsius.
mS/cm = milli-Siemens per centimeter.
NTU = Nephelometric Turbidity Unit.
mV = millivolt.
mg/L = milligrams per liter.
s.u. = standard unit.
Blank cells indicate parameter was not measured.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**
Sample ID:		**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**
Sample Date:		**3/18/2016**	**5/18/2016**	**7/20/2016**	**10/6/2016**	**1/31/2017**	**4/12/2017**	**7/12/2017**	**8/16/2017**
Parameters	**Units**								
Appendix III									
Boron	mg/L	1.4	0.88	0.811	1.08	1.82	1.54	1.94	1.74
Calcium	mg/L	135	205	281	229	80.7	150	116	93.3
Chloride	mg/L	281	247	148	206	415	282	266	324
Fluoride	mg/L	0.966	<0.500	<0.500	0.512	<0.500	0.667	<0.500	0.614
pH, lab	s.u.	10.2	11.5	10.9	10.7	11.3	10.7	9.8	9.9
Sulfate	mg/L	4670	3010	2760	5900	5380	3950	4720	4900
Total dissolved solids (TDS)	mg/L	8600	6950	5340	7480	10000	8200	8500	9480
Appendix IV									
Antimony	mg/L	0.00111	<0.001	<0.001	0.00129	0.00124	<0.001	0.00121	0.00125
Arsenic	mg/L	0.0261	0.0170	0.0133	0.0170	0.0210	0.0153	0.0174	0.0155
Barium	mg/L	0.0621	0.0681	0.0945	0.0841	0.0525	0.0526	0.0507	0.0504
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	0.000856	<0.0005	<0.0005	0.000622	0.00103	0.000782	0.000761	<0.0005
Chromium	mg/L	0.0352	0.0583	0.0225	0.133	0.0189	0.0210	0.0306	0.0184
Cobalt	mg/L	0.00129	0.000613	<0.0005	0.000619	0.000976	0.000765	0.000777	0.000780
Lead	mg/L	<0.00250	<0.0005	<0.0005	<0.0005	<0.001	<0.0005	<0.0005	<0.0005
Lithium	mg/L	<0.250	<0.200	0.110	<0.200	<0.300	<0.150	<0.250	<0.250
Mercury	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum	mg/L	4.32	2.30	2.00	3.48	4.74	3.86	4.17	3.79
Radium-226 & 228	pCi/L	0.446	0.671	0.653	0.790	0.501	0.502	1.07	0.558
Selenium	mg/L	0.280	0.185	0.150	0.234	0.375	0.305	0.254	0.260
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Footnotes:
J - Estimated concentration.
R - Rejected.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**
Sample ID:		**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**	**Leachate (Lift Station) #1**
Sample Date:		**10/10/2017**	**5/3/2018**	**10/10/2018**	**4/18/2019**	**10/30/2019**	**4/21/2020**	**10/14/2020**	**4/21/2021**
Parameters	**Units**								
Appendix III									
Boron	mg/L	1.57	1.99	3.73	1.17	1.75	1.65	1.63	1.53
Calcium	mg/L	148	126	199	190	508	186	159	170
Chloride	mg/L	269	318	281	291	272	312	278	233
Fluoride	mg/L	0.534	0.913	<0.500	<0.500	<0.500	<0.500	<1.00	0.687
pH, lab	s.u.	10	9	11.1	9.2	11.7	11.8	11.1	11.3
Sulfate	mg/L	4730	4840	3540	3910	3320	3890	5040	3930
Total dissolved solids (TDS)	mg/L	8520	9180	7280	6840	7240	7820	8100	6760
Appendix IV									
Antimony	mg/L	--	--	--	--	--	--	--	--
Arsenic	mg/L	--	--	--	--	--	--	--	--
Barium	mg/L	--	--	--	--	--	--	--	--
Beryllium	mg/L	--	--	--	--	--	--	--	--
Cadmium	mg/L	--	--	--	--	--	--	--	--
Chromium	mg/L	--	--	--	--	--	--	--	--
Cobalt	mg/L	--	--	--	--	--	--	--	--
Lead	mg/L	--	--	--	--	--	--	--	--
Lithium	mg/L	--	--	--	--	--	--	--	--
Mercury	mg/L	--	--	--	--	--	--	--	--
Molybdenum	mg/L	--	--	--	--	--	--	--	--
Radium-226 & 228	pCi/L	--	--	--	--	--	--	--	--
Selenium	mg/L	--	--	--	--	--	--	--	--
Thallium	mg/L	--	--	--	--	--	--	--	--

Footnotes:
J - Estimated concentration.
R - Rejected.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 1**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #1**	**Leachate-1**	**LS1-1022**	**LS1-0423**	**LS1-1023**	**LS1-0424**	**LS1-1024**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**
Sample Date:		**10/28/2021**	**4/29/2022**	**10/10/2022**	**4/25/2023**	**10/4/2023**	**4/2/2024**	**10/2/2024**	**3/18/2016**	**5/18/2016**	**7/20/2016**	**10/6/2016**
Parameters	**Units**											
Appendix III												
Boron	mg/L	2.01	1.81	1.69	2.36	1.81	2.12	1.84	1.81	1.68	1.7	1.51
Calcium	mg/L	138	127	69.1	104	87.4	50.4	89.2	123	144	119	109
Chloride	mg/L	263	271	288	289	293	311	319	438	710	592	633
Fluoride	mg/L	4.14	4.98	6.35	<1.00	<1.00	<1.00	<1.00	<0.500	<0.500	<0.500	<0.500
pH, lab	s.u.	11.4	10.9 J	11.7 J	11.0 J	11.8 J	11.2 J	12.0 J	10.9	11.8	11.7	11.9
Sulfate	mg/L	3700	4970	3850	5500	3980	75.9 R	3250	6000	6930	6750	7670
Total dissolved solids (TDS)	mg/L	5360	7390	7310	8020	7010	7170	6320	11500	13000	12600	12500
Appendix IV												
Antimony	mg/L	--	--	--	0.00200 J+	<0.00200	<0.00200	<0.00200	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/L	--	--	--	0.0474	0.0371	0.0533	0.0229	0.0368	0.0160	0.0196	0.0156
Barium	mg/L	--	--	--	0.0325	0.0357	0.0262	0.0324	0.0569	0.0942	0.0807	0.0753
Beryllium	mg/L	--	--	--	<0.00100	<0.00100	<0.00100	<0.00100	<0.001	<0.001	<0.001	<0.001
Cadmium	mg/L	--	--	--	0.00282	0.00200	0.00116	0.00157	0.00124	0.000715	0.000602	0.000806
Chromium	mg/L	--	--	--	0.00546	<0.00500	<0.00500	<0.00500	0.0402	0.0839	0.0452	0.0330
Cobalt	mg/L	--	--	--	0.00151	0.000945	0.00131	<0.000500	0.00193	0.000541	0.000614	0.000564
Lead	mg/L	--	--	--	<0.000500	<0.000500	<0.000500	<0.000500	<0.00250	<0.0005	<0.0005	<0.0005
Lithium	mg/L	--	--	--	0.0824	0.102	0.0788	0.112	<0.300	<0.300	<0.350	<0.400
Mercury	mg/L	--	--	--	<0.000200	<0.000200	<0.000200	<0.000200	<0.0002	<0.0002	0.000267	<0.0002
Molybdenum	mg/L	--	--	--	6.27	4.96	6.34	4.23	5.81	4.32	4.27	4.58
Radium-226 & 228	pCi/L	--	--	--	<0.346	<0.387	<1.13	0.712	0.495	0.399	0.114	1.71
Selenium	mg/L	--	--	--	0.420	0.371	0.315	0.350	0.408	0.370	0.384	0.370
Thallium	mg/L	--	--	--	<0.00100	<0.00100	<0.00100	0.00483	<0.001	<0.001	<0.001	<0.001

Footnotes:
J - Estimated concentration.
R - Rejected.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**
Sample Date:		**1/31/2017**	**4/12/2017**	**7/12/2017**	**8/16/2017**	**10/10/2017**	**5/3/2018**	**10/10/2018**	**4/18/2019**
Parameters	**Units**								
Appendix III									
Boron	mg/L	1.65	2.57	2.03	2.28	1.67	1.81	1.42	2.06
Calcium	mg/L	74.2	106	68.8	36.4	180	155	152	93.3
Chloride	mg/L	635	608	629	607	514	644	357	471
Fluoride	mg/L	13.5	<0.500	<0.500	<0.500	<0.500	0.698	<0.500	<0.500
pH, lab	s.u.	11.5	10.3	11.4	11.4	11.1	9.3	9.6	10.1
Sulfate	mg/L	7440	6520	6350	6610	6650	4950	4930	5210
Total dissolved solids (TDS)	mg/L	13500	13100	13000	13000	12200	8460	9200	9960
Appendix IV									
Antimony	mg/L	0.00113	<0.001	<0.001	<0.01	--	--	--	--
Arsenic	mg/L	0.0322	0.0152	0.0186	0.0160	--	--	--	--
Barium	mg/L	0.0482	0.0697	0.0529	0.0410	--	--	--	--
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	--	--	--	--
Cadmium	mg/L	0.00124	0.000892	0.000920	<0.005	--	--	--	--
Chromium	mg/L	0.0210	0.0613	0.0241	0.0190	--	--	--	--
Cobalt	mg/L	0.00157	0.00111	0.000675	0.000668	--	--	--	--
Lead	mg/L	<0.001	<0.0005	<0.0005	<0.0005	--	--	--	--
Lithium	mg/L	<0.400	<0.350	<0.350	<0.350	--	--	--	--
Mercury	mg/L	<0.0002	<0.0002	0.000252	<0.0002	--	--	--	--
Molybdenum	mg/L	5.43	3.80	5.10	4.79	--	--	--	--
Radium-226 & 228	pCi/L	1.17	0.433	0.190	0.258	--	--	--	--
Selenium	mg/L	0.425	0.374	0.417	0.427	--	--	--	--
Thallium	mg/L	<0.001	<0.001	<0.001	<0.001	--	--	--	--

Footnotes:
J - Estimated concentration.
R - Rejected.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**	**Lift Station 2**
Sample ID:		**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate (Lift Station) #2**	**Leachate-2**	**LS2-1022**	**LS2-0423**	**LS2-1023**	**LS2-0424**	**LS2-1024**
Sample Date:		**10/30/2019**	**4/21/2020**	**10/14/2020**	**4/21/2021**	**10/28/2021**	**4/29/2022**	**10/10/2022**	**4/25/2023**	**10/4/2023**	**4/2/2024**	**10/2/2024**
Parameters	**Units**											
Appendix III												
Boron	mg/L	2.38	2.97	2.66	2.86	2.82	2.12	2.15	3.38	1.91	3.03	2.13
Calcium	mg/L	210	93.7	28.6	55	53.9	36.7	26.2	269	46.6	36.2	126
Chloride	mg/L	183	487	586	428	453	618	549	648	564	586	403
Fluoride	mg/L	<0.500	<0.500	<1.00	<0.500	11.9	12.8	14.7	<1.00	<1.00	<1.00	<1.00
pH, lab	s.u.	9.2	10.6	11	11.3	11.3	11.1 J	10.7 J	10.6 J	10.1 J	9.8 J	11.4 J
Sulfate	mg/L	2490	5880	7810	5660	5350	6530	5680	6200	5900	5570	4560
Total dissolved solids (TDS)	mg/L	8640	11400	12500	9400	9640	10500	11200	9750	10700	10200	7540
Appendix IV												
Antimony	mg/L	--	--	--	--	--	--	--	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	--	--	--	--	--	--	--	0.00733	0.0188	0.0251	0.00832
Barium	mg/L	--	--	--	--	--	--	--	0.0526	0.0229	0.0275	0.0421
Beryllium	mg/L	--	--	--	--	--	--	--	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	--	--	--	--	--	--	--	0.00179	0.00254	0.00157	0.00141
Chromium	mg/L	--	--	--	--	--	--	--	0.980	<0.00500	0.0272	0.00500
Cobalt	mg/L	--	--	--	--	--	--	--	0.00122	0.000824	0.00224	<0.000500
Lead	mg/L	--	--	--	--	--	--	--	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	--	--	--	--	--	--	--	0.0147	0.0396	0.0744	0.0619
Mercury	mg/L	--	--	--	--	--	--	--	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	--	--	--	--	--	--	--	4.19	5.22	8.46	3.86
Radium-226 & 228	pCi/L	--	--	--	--	--	--	--	<0.305	<0.369	<1.11	0.629
Selenium	mg/L	--	--	--	--	--	--	--	0.249	0.367	0.423	0.253
Thallium	mg/L	--	--	--	--	--	--	--	<0.00100	<0.00400	<0.00100	<0.00400

Footnotes:
J - Estimated concentration.
R - Rejected.

Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**
Sample ID:		**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**
Sample Date:		**8/16/2017**	**10/10/2017**	**5/3/2018**	**10/10/2018**	**4/18/2019**	**10/30/2019**	**4/21/2020**	**10/14/2020**
Parameters	**Units**								
Appendix III									
Boron	mg/L	4.85	4.27	4.24	1.57	2.01	1.49	4.11	4.36
Calcium	mg/L	224	218	168	137	108	103	158	316
Chloride	mg/L	156	354	158	273	232	264	501	306
Fluoride	mg/L	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500	<0.500
pH, lab	s.u.	8.8	11.4	8.7	10.3	11.5	11.8	10.6	11
Sulfate	mg/L	2120	4930	1940	3430	3440	4480	4190	3590
Total dissolved solids (TDS)	mg/L	5040	10200	3840	6520	6320	5580	9020	5710
Appendix IV									
Antimony	mg/L	<0.001	--	--	--	--	--	--	--
Arsenic	mg/L	0.00293	--	--	--	--	--	--	--
Barium	mg/L	0.0556	--	--	--	--	--	--	--
Beryllium	mg/L	<0.001	--	--	--	--	--	--	--
Cadmium	mg/L	<0.0005	--	--	--	--	--	--	--
Chromium	mg/L	0.0505	--	--	--	--	--	--	--
Cobalt	mg/L	0.000607	--	--	--	--	--	--	--
Lead	mg/L	<0.0005	--	--	--	--	--	--	--
Lithium	mg/L	<0.250	--	--	--	--	--	--	--
Mercury	mg/L	<0.0002	--	--	--	--	--	--	--
Molybdenum	mg/L	1.08	--	--	--	--	--	--	--
Radium-226 & 228	pCi/L	0.303	--	--	--	--	--	--	--
Selenium	mg/L	0.0623	--	--	--	--	--	--	--
Thallium	mg/L	<0.001	--	--	--	--	--	--	--

Footnotes:
J - Estimated concentration.
R - Rejected.

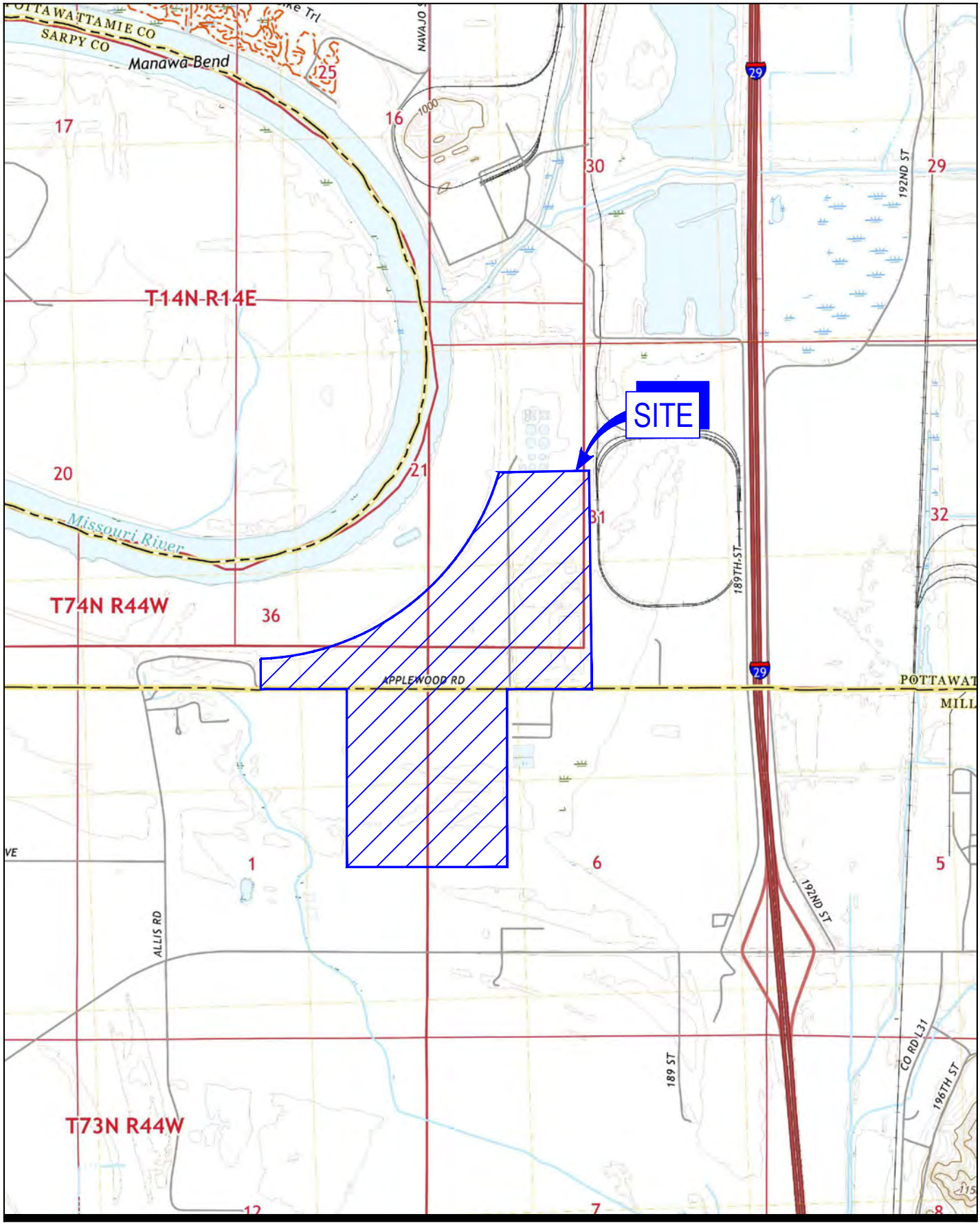
Table 4

Leachate Analytical Results
MidAmerican Energy Company
Walter Scott Jr. Energy Center CCR Monofill
Council Bluffs, Iowa

Sample Location:		**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**	**Lift Station 3**
Sample ID:		**Leachate (Lift Station) #3**	**Leachate (Lift Station) #3**	**Leachate-3**	**LS3-1022**	**LS3-0423**	**LS3-1023**	**LS3-0424**	**LS3-1024**
Sample Date:		**4/21/2021**	**10/28/2021**	**4/29/2022**	**10/10/2022**	**4/25/2023**	**10/4/2023**	**4/2/2024**	**10/2/2024**
Parameters	**Units**								
Appendix III									
Boron	mg/L	5.53	3.47	3.56	2.40	2.09	1.94	2.00	1.44
Calcium	mg/L	544	191	144	77.4	135	42.5	22.5	106
Chloride	mg/L	408	317	321	315	240	317	154	248
Fluoride	mg/L	0.515	3.2	3.69	4.82	<1.00	<1.00	<1.00	<1.00
pH, lab	s.u.	11.6	11.3	11.3 J	11.9 J	11.9 J	11.9 J	11.9 J	12.1 J
Sulfate	mg/L	3920	2690	2500	2910	3300	3070	1720	3030
Total dissolved solids (TDS)	mg/L	7260	4260	5400	6680	5520	6330	3550	5630
Appendix IV									
Antimony	mg/L	--	--	--	--	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	mg/L	--	--	--	--	0.0108	0.0170	0.0107	0.0206
Barium	mg/L	--	--	--	--	0.0564	0.0248	0.0249	0.0471
Beryllium	mg/L	--	--	--	--	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	mg/L	--	--	--	--	0.000790	0.000417	0.000211	0.000791
Chromium	mg/L	--	--	--	--	0.0103	<0.00500	<0.00500	<0.00500
Cobalt	mg/L	--	--	--	--	0.000683	0.000570	0.000550	<0.000500
Lead	mg/L	--	--	--	--	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	mg/L	--	--	--	--	<0.0100	<0.0100	<0.0100	0.0123
Mercury	mg/L	--	--	--	--	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	mg/L	--	--	--	--	1.80	2.33	1.26	2.10
Radium-226 & 228	pCi/L	--	--	--	--	<-0.0661	<0.585	<0.595	0.590
Selenium	mg/L	--	--	--	--	0.145	0.231	0.103	0.232
Thallium	mg/L	--	--	--	--	<0.00100	<0.00100	<0.00100	<0.00100

Footnotes:
J - Estimated concentration.
R - Rejected.

Figures



0 1000 2000 ft

1" = 2000 ft

Coordinate System:
I83-SF

N

GHD

MIDAMERICAN ENERGY COMAPNY
WALTER SCOTT JR. ENERGY CENTER
CCR MONOFILL
COUNCIL BLUFFS, IOWA

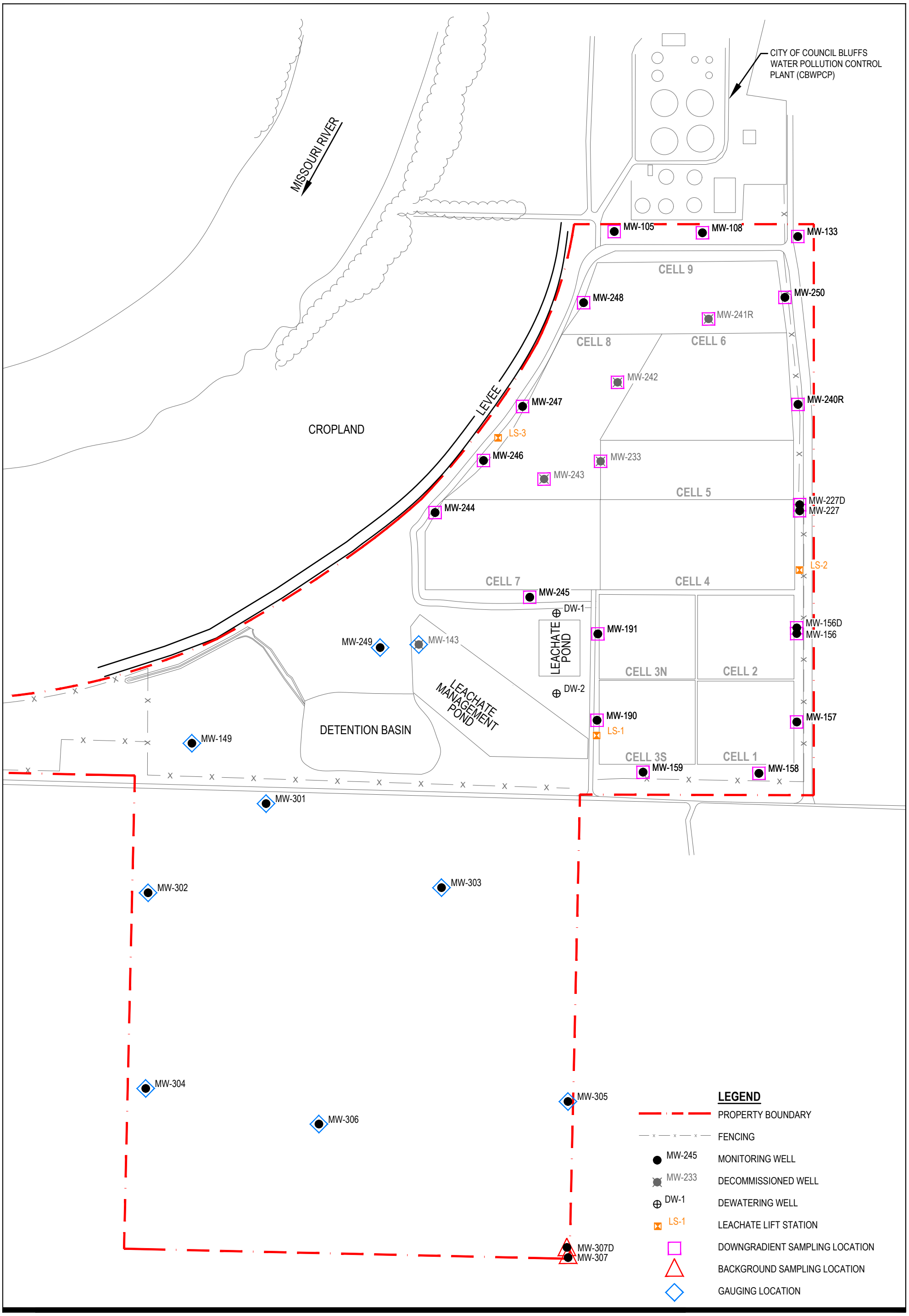
Project No. **12592594**
Date **January 2025**

SITE LOCATION MAP

FIGURE 1.1

Filename: N:\US\Des Moines\Projects\563\12592594\Digital_Design\ACAD\Figures\RPT024\12592594-GHD-00-00-RPT-EN-D001_GB-024.dwg
Plot Date: 09 January 2025 11:04 AM

Data Source: USGS Quadrangle Map, Council Bluffs South, IA (2022).



0 250 500 ft

1" = 500 ft

Coordinate System:
IA83-SF

N

GHD

MIDAMERICAN ENERGY COMPANY
WALTER SCOTT JR. ENERGY CENTER
CCR MONOFILL
COUNCIL BLUFFS, IOWA

SITE MAP AND MONITORING NETWORK

Project No. **12592594**
Date **January 2025**

FIGURE 1.2

Filename: N:\US\Des Moines\Projects\563\12592594\Digital_Design\ACAD\Figures\RPT024\12592594-GHD-00-00-RPT-EN-D101_GB-024.dwg
Plot Date: 09 January 2025 11:04 AM

Data Source: 05157640C32 Terracon Consulting Engineers and Scientists, Rec'd 10/2022

Appendices

Appendix A

Sample Collection Records

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS1 (Lift Station #1)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 4/2/2024
Weather: 33° F Overcast, windy

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
1130	na	na	--	11.04	9.270	-156.00	3.35	0.00	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS01-0424 Sample Time: 11:30

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS2 (Lift Station #2)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 4/2/2024
Weather: 33° F Overcast, windy

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
1105	na	na	--	9.56	13.570	-103.00	5.71	0.32	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS02-0424 Sample Time: 11:05

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS3 (Lift Station #3)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 4/2/2024
Weather: 33° F Overcast, windy

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
1148	na	na	--	--	5.540	-95.30	9.36	0.00	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS03-0424 Sample Time: 11:48

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS1 (Lift Station #1)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 10/2/2024
Weather: 49° F Sunny

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
10:55	na	na	17.77°	11.70	10.769	-126.70	3.19	4.80	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS1-1024 Sample Time: 10:55

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS2 (Lift Station #2)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 10/2/2024
Weather: 49° F Sunny

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
10:30	na	na	17.87	11.19	12.524	-198.40	2.65	17.87	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS2-1024 Sample Time: 10:30

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

LEACHATE
SAMPLE COLLECTION RECORD

Location ID: LS3 (Lift Station #3)

Job. No.: 12592594 **Client:** MidAmerican Energy Company
Location: WSEC CCR Monofill **Date:** 10/2/2024
Weather: 49° F Sunny

1. WATER LEVEL DATA: (from TOC)

a. Total Well Length (ft) na (Known, Meas.)
b. Depth to Water (ft) na
c. Length of water column (ft) na
d. One System Volume (mL) na
e. Well Diameter (in) na

2. WELL PURGING DATA:

a. Purge Method: Purged with leachate pump ~5 minutes prior to sampling
b. Purge Basis: ~5 minutes
c. Field Testing Equipment Used: Aquatroll 600

Time	DTW (ft)	Volume (mL)	Temperature (°C) *(± 0.5 °C)*	pH (s.u.) *(± 0.1 s.u.)*	Spec. Cond. (mS/cm) *(± 3%)*	ORP (mV) *(± 10 mV)*	DO (mg/L) *(± 0.3 mg/L)*	Turbidity (NTU) *(± 10% or <50)*	Color (Visual) *NA*
11:10	na	na	17.53	11.97	9.336	-139.70	2.16	14.61	--

3. SAMPLE COLLECTION: Bailer

Parameters reqquested for analysis Appendix III and Appendix IV to 40 CFR Part 257

Sample ID#: LS3-1024 Sample Time: 11:10

4. COMMENTS:

QA/QC samples collected:

Brooke Wasson
Sampler (Signature)

Brooke Wasson
(Print Name)

Appendix B

Laboratory Analytical Reports

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Kevin Armstrong
GHD Services Inc.
11228 Aurora Avenue
Des Moines, Iowa 50322-7905

Generated 8/6/2024 8:46:22 AM Revision 1

JOB DESCRIPTION

Midamerican WSEC CCR Monofill Leachate
12592594.DEL.001

JOB NUMBER

310-278036-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
8/6/2024 8:46:22 AM
Revision 1

Authorized for release by
Zach Bindert, Senior Project Manager
Zach.Bindert@et.eurofinsus.com
(319)595-2016

Table of Contents

Job ID: 310-278036-1 Eurofins Cedar Falls

Job Narrative
310-278036-1

Revision
The report being provided is a revision of the original report sent on 4/30/2024. The report (revision 1) is being revised due to: This report was revised 7/29/2024. The client requested that we review the sulfate result for sample LS-1. After review it was determined that the wrong sample was selected when doing the 1:50 dilution. The sulfate data on the 1:5 dilution was unusable.

Receipt
The samples were received on 4/3/2024 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.0º C.

HPLC/IC
Method 9056A: The continuing calibration verification (CCV) associated with batch 310-418131 recovered above the upper control limit for fluoride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: LS1-0424 (310-278036-1) and LS2-0424 (310-278036-2).

Method 9056A: The following samples were diluted due to the nature of the sample matrix: LS1-0424 (310-278036-1), LS2-0424 (310-278036-2) and LS3-0424 (310-278036-3). Elevated reporting limits (RLs) are provided.

Method 9056A: The continuing calibration verification (CCV) associated with batch 310-418131 recovered above the upper control limit for fluoride. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: LS1-0424 (310-278036-1), LS2-0424 (310-278036-2) and LS3-0424 (310-278036-3).

Method 9056A: Sulfate was not reported for LS1-0424 (310-278036-1). Sulfate was over calibration range and the sample was disposed before a correct dilution could be performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Metals
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Job ID: 310-278036-2 Eurofins Cedar Falls

Job Narrative
310-278036-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 4/3/2024 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 2.0°C.

Gas Flow Proportional Counter
Method 9320_Ra228: Radium-228 160-655526
The radium-228 detection goal was not met for the following sample due to the reduced sample volume attributed to the presence of matrix interferences: LS1-0424 (310-278036-1) and LS2-0424 (310-278036-2). Analytical results are reported with the detection limit achieved.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rad
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-278036-1	LS1-0424	Water	04/02/24 11:30	04/03/24 09:40
310-278036-2	LS2-0424	Water	04/02/24 11:10	04/03/24 09:40
310-278036-3	LS3-0424	Water	04/02/24 11:45	04/03/24 09:40

Detection Summary

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS1-0424 — Lab Sample ID: 310-278036-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	311		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.0533		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0262		0.00200		mg/L	1		6020B	Total/NA
Boron	2.12		0.400		mg/L	4		6020B	Total/NA
Cadmium	0.00116		0.000200		mg/L	1		6020B	Total/NA
Calcium	50.4		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00131		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.0788		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	6.34		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.315		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	7170		250		mg/L	1		SM 2540C	Total/NA
pH	11.2	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS2-0424 — Lab Sample ID: 310-278036-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	586		50.0		mg/L	50		9056A	Total/NA
Sulfate	5570		200		mg/L	200		9056A	Total/NA
Arsenic	0.0251		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0275		0.00200		mg/L	1		6020B	Total/NA
Boron	3.03		1.00		mg/L	10		6020B	Total/NA
Cadmium	0.00157		0.000200		mg/L	1		6020B	Total/NA
Calcium	36.2		0.500		mg/L	1		6020B	Total/NA
Chromium	0.0272		0.00500		mg/L	1		6020B	Total/NA
Cobalt	0.00224		0.000500		mg/L	1		6020B	Total/NA
Lithium	0.0744		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	8.46		0.0200		mg/L	10		6020B	Total/NA
Selenium	0.423		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	10200		250		mg/L	1		SM 2540C	Total/NA
pH	9.8	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS3-0424 — Lab Sample ID: 310-278036-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	154		5.00		mg/L	5		9056A	Total/NA
Sulfate	1720		50.0		mg/L	50		9056A	Total/NA
Arsenic	0.0107		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0249		0.00200		mg/L	1		6020B	Total/NA
Boron	2.00		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.000211		0.000200		mg/L	1		6020B	Total/NA
Calcium	22.5		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000550		0.000500		mg/L	1		6020B	Total/NA
Molybdenum	1.26		0.00200		mg/L	1		6020B	Total/NA
Selenium	0.103		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	3550		250		mg/L	1		SM 2540C	Total/NA
pH	11.9	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: LS1-0424

Date Collected: 04/02/24 11:30
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**311**		5.00		mg/L			04/04/24 15:09	5
Fluoride	<1.00	*+	1.00		mg/L			04/04/24 15:09	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:55	1
Arsenic	**0.0533**		0.00200		mg/L		04/05/24 09:00	04/10/24 19:55	1
Barium	**0.0262**		0.00200		mg/L		04/05/24 09:00	04/10/24 19:55	1
Beryllium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:55	1
Boron	**2.12**		0.400		mg/L		04/05/24 09:00	04/11/24 14:07	4
Cadmium	**0.00116**		0.000200		mg/L		04/05/24 09:00	04/10/24 19:55	1
Calcium	**50.4**		0.500		mg/L		04/05/24 09:00	04/10/24 19:55	1
Chromium	<0.00500		0.00500		mg/L		04/05/24 09:00	04/10/24 19:55	1
Cobalt	**0.00131**		0.000500		mg/L		04/05/24 09:00	04/10/24 19:55	1
Lithium	**0.0788**		0.0100		mg/L		04/05/24 09:00	04/10/24 19:55	1
Lead	<0.000500		0.000500		mg/L		04/05/24 09:00	04/10/24 19:55	1
Molybdenum	**6.34**		0.00800		mg/L		04/05/24 09:00	04/11/24 14:07	4
Selenium	**0.315**		0.00500		mg/L		04/05/24 09:00	04/10/24 19:55	1
Thallium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:55	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/05/24 14:12	04/08/24 15:21	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**7170**		250		mg/L			04/03/24 16:46	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.2**	**HF**	1.0		SU			04/03/24 12:03	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.282	U	0.167	0.167	1.00	0.282	pCi/L	04/05/24 10:55	04/29/24 16:17	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*49.0*		*30 - 110*	*04/05/24 10:55*	*04/29/24 16:17*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.34	U G	0.861	0.866	1.00	1.34	pCi/L	04/05/24 10:58	04/22/24 12:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*49.0*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:00*	*1*
Y Carrier	*77.4*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:00*	*1*

Client Sample Results

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS1-0424

Date Collected: 04/02/24 11:30
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-1

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<1.34	U	0.877	0.882	5.00	1.34	pCi/L		04/30/24 13:29	1

Client Sample ID: LS2-0424

Date Collected: 04/02/24 11:10
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**586**		50.0		mg/L			04/08/24 10:50	50
Fluoride	<1.00	*+	1.00		mg/L			04/04/24 22:13	5
Sulfate	**5570**		200		mg/L			04/08/24 11:38	200

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:58	1
Arsenic	**0.0251**		0.00200		mg/L		04/05/24 09:00	04/10/24 19:58	1
Barium	**0.0275**		0.00200		mg/L		04/05/24 09:00	04/10/24 19:58	1
Beryllium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:58	1
Boron	**3.03**		1.00		mg/L		04/05/24 09:00	04/11/24 14:09	10
Cadmium	**0.00157**		0.000200		mg/L		04/05/24 09:00	04/10/24 19:58	1
Calcium	**36.2**		0.500		mg/L		04/05/24 09:00	04/10/24 19:58	1
Chromium	**0.0272**		0.00500		mg/L		04/05/24 09:00	04/10/24 19:58	1
Cobalt	**0.00224**		0.000500		mg/L		04/05/24 09:00	04/10/24 19:58	1
Lithium	**0.0744**		0.0100		mg/L		04/05/24 09:00	04/10/24 19:58	1
Lead	<0.000500		0.000500		mg/L		04/05/24 09:00	04/10/24 19:58	1
Molybdenum	**8.46**		0.0200		mg/L		04/05/24 09:00	04/11/24 14:09	10
Selenium	**0.423**		0.00500		mg/L		04/05/24 09:00	04/10/24 19:58	1
Thallium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:58	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/05/24 14:12	04/08/24 15:02	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**10200**		250		mg/L			04/03/24 16:46	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**9.8**	**HF**	1.0		SU			04/03/24 12:04	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.227	U	0.158	0.159	1.00	0.227	pCi/L	04/05/24 10:55	04/29/24 16:17	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*51.3*		*30 - 110*	*04/05/24 10:55*	*04/29/24 16:17*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.32	U G	0.833	0.837	1.00	1.32	pCi/L	04/05/24 10:58	04/22/24 12:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*51.3*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:00*	*1*
Y Carrier	*74.8*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:00*	*1*

Client Sample Results

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS2-0424
Date Collected: 04/02/24 11:10
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-2
Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<1.32	U	0.848	0.852	5.00	1.32	pCi/L		04/30/24 13:29	1

Client Sample ID: LS3-0424 — Lab Sample ID: 310-278036-3

Date Collected: 04/02/24 11:45 **Matrix: Water**
Date Received: 04/03/24 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**154**		5.00		mg/L			04/04/24 22:27	5
Fluoride	<1.00	*+	1.00		mg/L			04/04/24 22:27	5
Sulfate	**1720**		50.0		mg/L			04/08/24 11:19	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 20:02	1
Arsenic	**0.0107**		0.00200		mg/L		04/05/24 09:00	04/10/24 20:02	1
Barium	**0.0249**		0.00200		mg/L		04/05/24 09:00	04/10/24 20:02	1
Beryllium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 20:02	1
Boron	**2.00**		0.100		mg/L		04/05/24 09:00	04/10/24 20:02	1
Cadmium	**0.000211**		0.000200		mg/L		04/05/24 09:00	04/10/24 20:02	1
Calcium	**22.5**		0.500		mg/L		04/05/24 09:00	04/10/24 20:02	1
Chromium	<0.00500		0.00500		mg/L		04/05/24 09:00	04/10/24 20:02	1
Cobalt	**0.000550**		0.000500		mg/L		04/05/24 09:00	04/10/24 20:02	1
Lithium	<0.0100		0.0100		mg/L		04/05/24 09:00	04/10/24 20:02	1
Lead	<0.000500		0.000500		mg/L		04/05/24 09:00	04/10/24 20:02	1
Molybdenum	**1.26**		0.00200		mg/L		04/05/24 09:00	04/10/24 20:02	1
Selenium	**0.103**		0.00500		mg/L		04/05/24 09:00	04/10/24 20:02	1
Thallium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 20:02	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/05/24 14:12	04/08/24 15:04	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**3550**		250		mg/L			04/03/24 16:46	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.9**	**HF**	1.0		SU			04/03/24 12:05	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.185	U	0.116	0.117	1.00	0.185	pCi/L	04/05/24 10:55	04/29/24 16:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*82.3*		*30 - 110*	*04/05/24 10:55*	*04/29/24 16:18*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.904	U	0.551	0.553	1.00	0.904	pCi/L	04/05/24 10:58	04/22/24 12:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*82.3*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:01*	*1*
Y Carrier	*75.5*		*30 - 110*	*04/05/24 10:58*	*04/22/24 12:01*	*1*

Client Sample Results

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS3-0424

Date Collected: 04/02/24 11:45
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-3

Matrix: Water

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.904	U	0.563	0.565	5.00	0.904	pCi/L		04/30/24 13:29	1

Definitions/Glossary

Client: GHD Services Inc. Job ID: 310-278036-1
Project/Site: Midamerican WSEC CCR Monofill Leachate SDG: 12592594.DEL.001

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-418131/3
Matrix: Water
Analysis Batch: 418131

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			04/04/24 18:13	1
Fluoride	<0.200		0.200		mg/L			04/04/24 18:13	1
Sulfate	<1.00		1.00		mg/L			04/04/24 18:13	1

Lab Sample ID: LCS 310-418131/4
Matrix: Water
Analysis Batch: 418131

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.12		mg/L		101	90 - 110
Fluoride	2.00	2.244	*+	mg/L		112	90 - 110
Sulfate	10.0	10.97		mg/L		110	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-417898/1-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 417898

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:16	1
Arsenic	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:16	1
Barium	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:16	1
Beryllium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:16	1
Cadmium	<0.000200		0.000200		mg/L		04/05/24 09:00	04/10/24 19:16	1
Calcium	<0.500		0.500		mg/L		04/05/24 09:00	04/10/24 19:16	1
Chromium	<0.00500		0.00500		mg/L		04/05/24 09:00	04/10/24 19:16	1
Cobalt	<0.000500		0.000500		mg/L		04/05/24 09:00	04/10/24 19:16	1
Lithium	<0.0100		0.0100		mg/L		04/05/24 09:00	04/10/24 19:16	1
Lead	<0.000500		0.000500		mg/L		04/05/24 09:00	04/10/24 19:16	1
Molybdenum	<0.00200		0.00200		mg/L		04/05/24 09:00	04/10/24 19:16	1
Selenium	<0.00500		0.00500		mg/L		04/05/24 09:00	04/10/24 19:16	1
Thallium	<0.00100		0.00100		mg/L		04/05/24 09:00	04/10/24 19:16	1

Lab Sample ID: MB 310-417898/1-A
Matrix: Water
Analysis Batch: 418555

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 417898

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<0.100		0.100		mg/L		04/05/24 09:00	04/11/24 13:42	1

Lab Sample ID: LCS 310-417898/2-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 417898

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2159		mg/L		108	80 - 120
Arsenic	0.200	0.2177		mg/L		109	80 - 120
Barium	0.100	0.1090		mg/L		109	80 - 120
Beryllium	0.100	0.09696		mg/L		97	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-417898/2-A
Matrix: Water
Analysis Batch: 418441

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 417898

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	0.100	0.1067		mg/L		107	80 - 120
Calcium	2.00	1.681		mg/L		84	80 - 120
Chromium	0.100	0.1101		mg/L		110	80 - 120
Cobalt	0.100	0.1110		mg/L		111	80 - 120
Lithium	0.200	0.2006		mg/L		100	80 - 120
Lead	0.200	0.2155		mg/L		108	80 - 120
Molybdenum	0.200	0.2130		mg/L		107	80 - 120
Selenium	0.400	0.4103		mg/L		103	80 - 120
Thallium	0.100	0.1034		mg/L		103	80 - 120

Lab Sample ID: LCS 310-417898/2-A
Matrix: Water
Analysis Batch: 418555

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 417898

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	0.200	0.2075		mg/L		104	80 - 120

Lab Sample ID: 310-278036-2 DU
Matrix: Water
Analysis Batch: 418441

Client Sample ID: LS2-0424
Prep Type: Total/NA
Prep Batch: 417898

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.00200		<0.00200		mg/L		NC	20
Arsenic	0.0251		0.02554		mg/L		2	20
Barium	0.0275		0.02747		mg/L		0.3	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Cadmium	0.00157		0.001582		mg/L		1	20
Calcium	36.2		37.76		mg/L		4	20
Chromium	0.0272		0.02660		mg/L		2	20
Cobalt	0.00224		0.002278		mg/L		2	20
Lithium	0.0744		0.07639		mg/L		3	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Selenium	0.423		0.4292		mg/L		2	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Lab Sample ID: 310-278036-2 DU
Matrix: Water
Analysis Batch: 418555

Client Sample ID: LS2-0424
Prep Type: Total/NA
Prep Batch: 417898

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Boron	3.03		2.881		mg/L		5	20
Molybdenum	8.46		7.909		mg/L		7	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-418014/1-A
Matrix: Water
Analysis Batch: 418170

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 418014

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		04/05/24 14:12	04/08/24 14:43	1

Lab Sample ID: LCS 310-418014/2-A
Matrix: Water
Analysis Batch: 418170

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 418014

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury			0.00167	0.001740		mg/L		104	80 - 120		

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-417775/1
Matrix: Water
Analysis Batch: 417775

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			04/03/24 16:46	1

Lab Sample ID: LCS 310-417775/2
Matrix: Water
Analysis Batch: 417775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids			1000	934.0		mg/L		93	90 - 110		

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-417741/1
Matrix: Water
Analysis Batch: 417741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	98 - 102		

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-655525/1-A
Matrix: Water
Analysis Batch: 659075

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 655525

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.0904	U	0.0624	0.0627	1.00	0.0904	pCi/L	04/05/24 10:55	04/29/24 16:21	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*101*		*30 - 110*	*04/05/24 10:55*	*04/29/24 16:21*	*1*

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-655525/2-A
Matrix: Water
Analysis Batch: 659075

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 655525

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.23		1.07	1.00	0.0958	pCi/L	90	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*101*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-655526/1-A
Matrix: Water
Analysis Batch: 658079

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 655526

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.559	U	0.314	0.314	1.00	0.559	pCi/L	04/05/24 10:58	04/22/24 11:58	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*101*		*30 - 110*	*04/05/24 10:58*	*04/22/24 11:58*	*1*
Y Carrier	*77.0*		*30 - 110*	*04/05/24 10:58*	*04/22/24 11:58*	*1*

Lab Sample ID: LCS 160-655526/2-A
Matrix: Water
Analysis Batch: 658079

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 655526

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			9.01	10.26		1.33	1.00	0.429	pCi/L	114	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*101*		*30 - 110*
Y Carrier	*82.2*		*30 - 110*

HPLC/IC

Analysis Batch: 418131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	9056A	
310-278036-2	LS2-0424	Total/NA	Water	9056A	
310-278036-2	LS2-0424	Total/NA	Water	9056A	
310-278036-2	LS2-0424	Total/NA	Water	9056A	
310-278036-3	LS3-0424	Total/NA	Water	9056A	
310-278036-3	LS3-0424	Total/NA	Water	9056A	
MB 310-418131/3	Method Blank	Total/NA	Water	9056A	
LCS 310-418131/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 417898

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	3005A	
310-278036-2	LS2-0424	Total/NA	Water	3005A	
310-278036-3	LS3-0424	Total/NA	Water	3005A	
MB 310-417898/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-417898/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-278036-2 DU	LS2-0424	Total/NA	Water	3005A	

Prep Batch: 418014

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	7470A	
310-278036-2	LS2-0424	Total/NA	Water	7470A	
310-278036-3	LS3-0424	Total/NA	Water	7470A	
MB 310-418014/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-418014/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 418170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	7470A	418014
310-278036-2	LS2-0424	Total/NA	Water	7470A	418014
310-278036-3	LS3-0424	Total/NA	Water	7470A	418014
MB 310-418014/1-A	Method Blank	Total/NA	Water	7470A	418014
LCS 310-418014/2-A	Lab Control Sample	Total/NA	Water	7470A	418014

Analysis Batch: 418441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	6020B	417898
310-278036-2	LS2-0424	Total/NA	Water	6020B	417898
310-278036-3	LS3-0424	Total/NA	Water	6020B	417898
MB 310-417898/1-A	Method Blank	Total/NA	Water	6020B	417898
LCS 310-417898/2-A	Lab Control Sample	Total/NA	Water	6020B	417898
310-278036-2 DU	LS2-0424	Total/NA	Water	6020B	417898

Analysis Batch: 418555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	6020B	417898
310-278036-2	LS2-0424	Total/NA	Water	6020B	417898
MB 310-417898/1-A	Method Blank	Total/NA	Water	6020B	417898
LCS 310-417898/2-A	Lab Control Sample	Total/NA	Water	6020B	417898

Metals (Continued)

Analysis Batch: 418555 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-2 DU	LS2-0424	Total/NA	Water	6020B	417898

General Chemistry

Analysis Batch: 417741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	SM 4500 H+ B	
310-278036-2	LS2-0424	Total/NA	Water	SM 4500 H+ B	
310-278036-3	LS3-0424	Total/NA	Water	SM 4500 H+ B	
LCS 310-417741/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 417775

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	SM 2540C	
310-278036-2	LS2-0424	Total/NA	Water	SM 2540C	
310-278036-3	LS3-0424	Total/NA	Water	SM 2540C	
MB 310-417775/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-417775/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 655525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	PrecSep-21	
310-278036-2	LS2-0424	Total/NA	Water	PrecSep-21	
310-278036-3	LS3-0424	Total/NA	Water	PrecSep-21	
MB 160-655525/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-655525/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 655526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-278036-1	LS1-0424	Total/NA	Water	PrecSep_0	
310-278036-2	LS2-0424	Total/NA	Water	PrecSep_0	
310-278036-3	LS3-0424	Total/NA	Water	PrecSep_0	
MB 160-655526/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-655526/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS1-0424
Date Collected: 04/02/24 11:30
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418131	QTZ5	EET CF	04/04/24 15:09
Total/NA	Prep	3005A			417898	KM3E	EET CF	04/05/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 19:55
Total/NA	Prep	3005A			417898	KM3E	EET CF	04/05/24 09:00
Total/NA	Analysis	6020B		4	418555	NFT2	EET CF	04/11/24 14:07
Total/NA	Prep	7470A			418014	A6US	EET CF	04/05/24 14:12
Total/NA	Analysis	7470A		1	418170	DHM5	EET CF	04/08/24 15:21
Total/NA	Analysis	SM 2540C		1	417775	D7CP	EET CF	04/03/24 16:46
Total/NA	Analysis	SM 4500 H+ B		1	417741	W9YR	EET CF	04/03/24 12:03
Total/NA	Prep	PrecSep-21			655525	KAK	EET SL	04/05/24 10:55
Total/NA	Analysis	9315		1	659076	SCB	EET SL	04/29/24 16:17
Total/NA	Prep	PrecSep_0			655526	KAK	EET SL	04/05/24 10:58
Total/NA	Analysis	9320		1	658079	MLK	EET SL	04/22/24 12:00
Total/NA	Analysis	Ra226_Ra228		1	659290	FLC	EET SL	04/30/24 13:29

Client Sample ID: LS2-0424
Date Collected: 04/02/24 11:10
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418131	QTZ5	EET CF	04/04/24 22:13
Total/NA	Analysis	9056A		50	418131	QTZ5	EET CF	04/08/24 10:50
Total/NA	Analysis	9056A		200	418131	QTZ5	EET CF	04/08/24 11:38
Total/NA	Prep	3005A			417898	KM3E	EET CF	04/05/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 19:58
Total/NA	Prep	3005A			417898	KM3E	EET CF	04/05/24 09:00
Total/NA	Analysis	6020B		10	418555	NFT2	EET CF	04/11/24 14:09
Total/NA	Prep	7470A			418014	A6US	EET CF	04/05/24 14:12
Total/NA	Analysis	7470A		1	418170	DHM5	EET CF	04/08/24 15:02
Total/NA	Analysis	SM 2540C		1	417775	D7CP	EET CF	04/03/24 16:46
Total/NA	Analysis	SM 4500 H+ B		1	417741	W9YR	EET CF	04/03/24 12:04
Total/NA	Prep	PrecSep-21			655525	KAK	EET SL	04/05/24 10:55
Total/NA	Analysis	9315		1	659076	SCB	EET SL	04/29/24 16:17
Total/NA	Prep	PrecSep_0			655526	KAK	EET SL	04/05/24 10:58
Total/NA	Analysis	9320		1	658079	MLK	EET SL	04/22/24 12:00
Total/NA	Analysis	Ra226_Ra228		1	659290	FLC	EET SL	04/30/24 13:29

Client Sample ID: LS3-0424
Date Collected: 04/02/24 11:45
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	418131	QTZ5	EET CF	04/04/24 22:27
Total/NA	Analysis	9056A		50	418131	QTZ5	EET CF	04/08/24 11:19

Lab Chronicle

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Client Sample ID: LS3-0424

Date Collected: 04/02/24 11:45
Date Received: 04/03/24 09:40

Lab Sample ID: 310-278036-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			417898	KM3E	EET CF	04/05/24 09:00
Total/NA	Analysis	6020B		1	418441	NFT2	EET CF	04/10/24 20:02
Total/NA	Prep	7470A			418014	A6US	EET CF	04/05/24 14:12
Total/NA	Analysis	7470A		1	418170	DHM5	EET CF	04/08/24 15:04
Total/NA	Analysis	SM 2540C		1	417775	D7CP	EET CF	04/03/24 16:46
Total/NA	Analysis	SM 4500 H+ B		1	417741	W9YR	EET CF	04/03/24 12:05
Total/NA	Prep	PrecSep-21			655525	KAK	EET SL	04/05/24 10:55
Total/NA	Analysis	9315		1	659076	SCB	EET SL	04/29/24 16:18
Total/NA	Prep	PrecSep_0			655526	KAK	EET SL	04/05/24 10:58
Total/NA	Analysis	9320		1	657955	SCB	EET SL	04/22/24 12:01
Total/NA	Analysis	Ra226_Ra228		1	659290	FLC	EET SL	04/30/24 13:29

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	05-27-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Water	Lithium

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-24
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-24
HI - RadChem Recognition	State	n/a	06-30-24
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-24
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Massachusetts	State	M-MO054	06-30-24
MI - RadChem Recognition	State	9005	06-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-24
New Mexico	State	MO00054	06-30-24
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
North Dakota	State	R-207	06-30-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-24
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	10310	06-15-25
Washington	State	C592	08-30-24

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Accreditation/Certification Summary

Client: GHD Services Inc.
Job ID: 310-278036-1
Project/Site: Midamerican WSEC CCR Monofill Leachate
SDG: 12592594.DEL.001

Laboratory: Eurofins St. Louis (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
West Virginia DEP	State	381	10-31-24

Method Summary

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

None = None
SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-278036 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: GHD

City/State: CITY | STATE FA | Project:

Receipt Information

Date/Time Received: DATE 4-3-24 | TIME 940 | Received By: MV

Delivery Type: ☐ UPS ☒ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☐ Yes	☒ No	*If yes:* Cooler # _____ of _____
Cooler Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: X | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.0 | Corrected Temp (°C): 2.0

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE: If yes, contact PM before proceeding If no, proceed with login

Additional Comments

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Brooke Wasson / Paige Richards	Lab PM: Zach Bindert	Carrier Tracking No(s).	COC No:
Client Contact: Kevin Armstrong	Phone: 515-414-3933	E-Mail: Zach.Bindert@ET.EurofinsUS.com		Page: 1 of 1
Company: GHD Services Inc.				Job #: 12592594

Address: 11228 Aurora Avenue	Due Date Requested	Analysis Requested
City: Des Moines	TAT Requested (days): Standard	
State, Zip: IA, 50322-7905		
Phone: 515-414-3935	PO #: 340-016858	
Email: Kevin.Armstrong@ghd.com	WO #:	
Project Name: MidAmerican WSEC CCR Monofill Leachate	Eurofins Project #: 31017236	
Project Number: 12592594 DEL.001	SSOW#: 12592594-002	

Preservation Codes.

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Rad226/Rad228/Rad228/228 combined	6020A CCR Metals List, 7470A Mercury	2540C TDS	9056A Chloride, Fluoride, Sulfate	SM4500_H+ pH									Total Number of containers	Special Instructions/Note.
			Preservation Code.				D	D	N	N	N										
LS1-0424	4/2/24	1130	G	W	N	N	X	X	X	X	X										
LS2-0424	4/2/24	1110	G	W	N	N	X	X	X	X	X										
LS3-0424	4/2/24	1145	G	W	N	N	X	X	X	X	X										

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ■ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ■ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I II III IV Other (specify)

Special Instructions/QC Requirements. Database Facility Code GD-MidAmerican-01723

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Brooke Wasson	4/2/24 1500	GHD	FEDEX		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 4/3/24 0940	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-278036-1
SDG Number: 12592594.DEL.001

Login Number: 278036
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: GHD Services Inc.
Project/Site: Midamerican WSEC CCR Monofill Leachate

Job ID: 310-278036-1
SDG: 12592594.DEL.001

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
310-278036-1	LS1-0424	49.0
310-278036-2	LS2-0424	51.3
310-278036-3	LS3-0424	82.3
LCS 160-655525/2-A	Lab Control Sample	101
MB 160-655525/1-A	Method Blank	101

Tracer/Carrier Legend

Ba = Barium

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-278036-1	LS1-0424	49.0	77.4
310-278036-2	LS2-0424	51.3	74.8
310-278036-3	LS3-0424	82.3	75.5
LCS 160-655526/2-A	Lab Control Sample	101	82.2
MB 160-655526/1-A	Method Blank	101	77.0

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Kevin Armstrong
GHD Services Inc.
11228 Aurora Avenue
Des Moines, Iowa 50322-7905

Generated 10/30/2024 4:21:24 PM

JOB DESCRIPTION

MidAmerican WSEC CCR Monofill Leachate
Leachate

JOB NUMBER

310-291895-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

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Authorized for release by
Zach Bindert, Senior Project Manager
Zach.Bindert@et.eurofinsus.com
(319)595-2016

Table of Contents

Job ID: 310-291895-1 Eurofins Cedar Falls

Job Narrative
310-291895-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/3/2024 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.6°C.

HPLC/IC
Method 9056A_ORGFM_28D: The following sample was diluted due to the nature of the sample matrix: LS3-1024 (310-291895-3). Elevated reporting limits (RLs) are provided.

Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: LS1-1024 (310-291895-1) and LS2-1024 (310-291895-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method SM4500_H+: Sample LS1-1024 (310-291895-1), LS2-1024 (310-291895-2) and LS3-1024 (310-291895-3) was over the top standard for pH.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Job ID: 310-291895-2 Eurofins Cedar Falls

Job Narrative
310-291895-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 10/3/2024 9:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.6°C.

Gas Flow Proportional Counter
Method 9320_Ra228: Radium-228 batch 682414
The detection goal was not met for the following sample due to the reduced sample volume attributed to the presence of matrix interferences: LS3-1024 (310-291895-3). Analytical results are reported with the detection limit achieved.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Rad
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-291895-1	LS1-1024	Water	10/02/24 10:55	10/03/24 09:15
310-291895-2	LS2-1024	Water	10/02/24 10:30	10/03/24 09:15
310-291895-3	LS3-1024	Water	10/02/24 11:10	10/03/24 09:15

Detection Summary

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1024
Lab Sample ID: 310-291895-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	319		5.00		mg/L	5		9056A	Total/NA
Sulfate	3250		200		mg/L	200		9056A	Total/NA
Arsenic	0.0229		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0324		0.00200		mg/L	1		6020B	Total/NA
Boron	1.84		0.400		mg/L	4		6020B	Total/NA
Cadmium	0.00157		0.000200		mg/L	1		6020B	Total/NA
Calcium	89.2		0.500		mg/L	1		6020B	Total/NA
Lithium	0.112		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	4.23		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.350		0.00500		mg/L	1		6020B	Total/NA
Thallium	0.00483		0.00400		mg/L	4		6020B	Total/NA
Total Dissolved Solids	6320		500		mg/L	1		SM 2540C	Total/NA
pH	12.0	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS2-1024
Lab Sample ID: 310-291895-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	403		5.00		mg/L	5		9056A	Total/NA
Sulfate	4560		50.0		mg/L	50		9056A	Total/NA
Arsenic	0.00832		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0421		0.00200		mg/L	1		6020B	Total/NA
Boron	2.13		0.400		mg/L	4		6020B	Total/NA
Cadmium	0.00141		0.000200		mg/L	1		6020B	Total/NA
Calcium	126		2.00		mg/L	4		6020B	Total/NA
Chromium	0.00500		0.00500		mg/L	1		6020B	Total/NA
Lithium	0.0619		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	3.86		0.00800		mg/L	4		6020B	Total/NA
Selenium	0.253		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	7540		500		mg/L	1		SM 2540C	Total/NA
pH	11.4	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

Client Sample ID: LS3-1024
Lab Sample ID: 310-291895-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	248		5.00		mg/L	5		9056A	Total/NA
Sulfate	3030		50.0		mg/L	50		9056A	Total/NA
Arsenic	0.0206		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0471		0.00200		mg/L	1		6020B	Total/NA
Boron	1.44		0.100		mg/L	1		6020B	Total/NA
Cadmium	0.000791		0.000200		mg/L	1		6020B	Total/NA
Calcium	106		0.500		mg/L	1		6020B	Total/NA
Lithium	0.0123		0.0100		mg/L	1		6020B	Total/NA
Molybdenum	2.10		0.00200		mg/L	1		6020B	Total/NA
Selenium	0.232		0.00500		mg/L	1		6020B	Total/NA
Total Dissolved Solids	5630		250		mg/L	1		SM 2540C	Total/NA
pH	12.1	HF	1.0		SU	1		SM 4500 H+ B	Total/NA

This Detection Summary does not include radiochemical test results.

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1024
Lab Sample ID: 310-291895-1
Date Collected: 10/02/24 10:55
Matrix: Water
Date Received: 10/03/24 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**319**		5.00		mg/L			10/09/24 10:50	5
Fluoride	<1.00		1.00		mg/L			10/09/24 10:50	5
Sulfate	**3250**		200		mg/L			10/09/24 11:02	200

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:52	1
Arsenic	**0.0229**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:52	1
Barium	**0.0324**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:52	1
Beryllium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/09/24 17:52	1
Boron	**1.84**		0.400		mg/L		10/07/24 09:30	10/15/24 12:50	4
Cadmium	**0.00157**		0.000200		mg/L		10/07/24 09:30	10/09/24 17:52	1
Calcium	**89.2**		0.500		mg/L		10/07/24 09:30	10/09/24 17:52	1
Chromium	<0.00500		0.00500		mg/L		10/07/24 09:30	10/09/24 17:52	1
Cobalt	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:52	1
Lithium	**0.112**		0.0100		mg/L		10/07/24 09:30	10/09/24 17:52	1
Lead	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:52	1
Molybdenum	**4.23**		0.00800		mg/L		10/07/24 09:30	10/14/24 17:50	4
Selenium	**0.350**		0.00500		mg/L		10/07/24 09:30	10/09/24 17:52	1
Thallium	**0.00483**		0.00400		mg/L		10/07/24 09:30	10/14/24 17:50	4

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/09/24 16:10	10/10/24 12:09	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**6320**		500		mg/L			10/04/24 16:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**12.0**	**HF**	1.0		SU			10/03/24 10:54	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.144	U	0.0505	0.0507	1.00	0.144	pCi/L	10/07/24 10:04	10/29/24 22:56	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.4*		*30 - 110*	*10/07/24 10:04*	*10/29/24 22:56*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.853	U	0.558	0.563	1.00	0.853	pCi/L	10/07/24 10:07	10/21/24 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*87.4*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:23*	*1*
Y Carrier	*79.3*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:23*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1024
Lab Sample ID: 310-291895-1
Date Collected: 10/02/24 10:55
Matrix: Water
Date Received: 10/03/24 09:15

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.853	U	0.560	0.565	5.00	0.853	pCi/L		10/30/24 15:56	1

Client Sample ID: LS2-1024 — Lab Sample ID: 310-291895-2

Date Collected: 10/02/24 10:30 — **Matrix: Water**
Date Received: 10/03/24 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**403**		5.00		mg/L			10/09/24 11:14	5
Fluoride	<1.00		1.00		mg/L			10/09/24 11:14	5
Sulfate	**4560**		50.0		mg/L			10/09/24 11:26	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:54	1
Arsenic	**0.00832**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:54	1
Barium	**0.0421**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:54	1
Beryllium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/09/24 17:54	1
Boron	**2.13**		0.400		mg/L		10/07/24 09:30	10/15/24 12:52	4
Cadmium	**0.00141**		0.000200		mg/L		10/07/24 09:30	10/09/24 17:54	1
Calcium	**126**		2.00		mg/L		10/07/24 09:30	10/14/24 17:53	4
Chromium	**0.00500**		0.00500		mg/L		10/07/24 09:30	10/09/24 17:54	1
Cobalt	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:54	1
Lithium	**0.0619**		0.0100		mg/L		10/07/24 09:30	10/09/24 17:54	1
Lead	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:54	1
Molybdenum	**3.86**		0.00800		mg/L		10/07/24 09:30	10/14/24 17:53	4
Selenium	**0.253**		0.00500		mg/L		10/07/24 09:30	10/09/24 17:54	1
Thallium	<0.00400		0.00400		mg/L		10/07/24 09:30	10/14/24 17:53	4

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/09/24 16:10	10/10/24 12:11	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**7540**		500		mg/L			10/04/24 16:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**11.4**	**HF**	1.0		SU			10/03/24 10:55	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.142	U	0.0761	0.0762	1.00	0.142	pCi/L	10/07/24 10:04	10/29/24 23:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*80.2*		*30 - 110*	*10/07/24 10:04*	*10/29/24 23:00*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.937	U	0.585	0.588	1.00	0.937	pCi/L	10/07/24 10:07	10/21/24 12:23	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*80.2*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:23*	*1*
Y Carrier	*72.1*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:23*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS2-1024
Lab Sample ID: 310-291895-2
Date Collected: 10/02/24 10:30
Matrix: Water
Date Received: 10/03/24 09:15

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<0.937	U	0.590	0.593	5.00	0.937	pCi/L		10/30/24 15:56	1

Client Sample ID: LS3-1024 — Lab Sample ID: 310-291895-3

Date Collected: 10/02/24 11:10 — **Matrix: Water**
Date Received: 10/03/24 09:15

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**248**		5.00		mg/L			10/08/24 16:56	5
Fluoride	<1.00		1.00		mg/L			10/08/24 16:56	5
Sulfate	**3030**		50.0		mg/L			10/08/24 17:08	50

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:57	1
Arsenic	**0.0206**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:57	1
Barium	**0.0471**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:57	1
Beryllium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/09/24 17:57	1
Boron	**1.44**		0.100		mg/L		10/07/24 09:30	10/15/24 12:54	1
Cadmium	**0.000791**		0.000200		mg/L		10/07/24 09:30	10/09/24 17:57	1
Calcium	**106**		0.500		mg/L		10/07/24 09:30	10/09/24 17:57	1
Chromium	<0.00500		0.00500		mg/L		10/07/24 09:30	10/09/24 17:57	1
Cobalt	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:57	1
Lithium	**0.0123**		0.0100		mg/L		10/07/24 09:30	10/09/24 17:57	1
Lead	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:57	1
Molybdenum	**2.10**		0.00200		mg/L		10/07/24 09:30	10/09/24 17:57	1
Selenium	**0.232**		0.00500		mg/L		10/07/24 09:30	10/09/24 17:57	1
Thallium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/14/24 17:55	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/09/24 16:10	10/10/24 12:14	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	**5630**		250		mg/L			10/04/24 16:18	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SM 4500 H+ B)	**12.1**	**HF**	1.0		SU			10/03/24 10:56	1

Method: SW846 9315 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.136	U	0.0360	0.0364	1.00	0.136	pCi/L	10/07/24 10:04	10/29/24 23:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.3*		*30 - 110*	*10/07/24 10:04*	*10/29/24 23:00*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.02	U G	0.633	0.636	1.00	1.02	pCi/L	10/07/24 10:07	10/21/24 12:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*85.3*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:24*	*1*
Y Carrier	*79.3*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:24*	*1*

Client Sample Results

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS3-1024
Lab Sample ID: 310-291895-3
Date Collected: 10/02/24 11:10
Matrix: Water
Date Received: 10/03/24 09:15

Method: TAL-STL Ra226_Ra228 - Combined Radium-226 and Radium-228

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	<1.02	U	0.634	0.637	5.00	1.02	pCi/L		10/30/24 15:56	1

Definitions/Glossary

Client: GHD Services Inc. Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-435819/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435819

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/08/24 09:18	1
Fluoride	<0.200		0.200		mg/L			10/08/24 09:18	1
Sulfate	<1.00		1.00		mg/L			10/08/24 09:18	1

Lab Sample ID: LCS 310-435819/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435819

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.851		mg/L		99	90 - 110
Fluoride	2.00	2.035		mg/L		102	90 - 110
Sulfate	10.0	9.961		mg/L		100	90 - 110

Lab Sample ID: MB 310-435853/3 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435853

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			10/09/24 10:16	1
Fluoride	<0.200		0.200		mg/L			10/09/24 10:16	1
Sulfate	<1.00		1.00		mg/L			10/09/24 10:16	1

Lab Sample ID: LCS 310-435853/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435853

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.864		mg/L		99	90 - 110
Fluoride	2.00	2.050		mg/L		103	90 - 110
Sulfate	10.0	10.08		mg/L		101	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-435317/1-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 435770 — **Prep Batch: 435317**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:02	1
Arsenic	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:02	1
Barium	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:02	1
Beryllium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/09/24 17:02	1
Boron	<0.100		0.100		mg/L		10/07/24 09:30	10/09/24 17:02	1
Cadmium	<0.000200		0.000200		mg/L		10/07/24 09:30	10/09/24 17:02	1
Calcium	<0.500		0.500		mg/L		10/07/24 09:30	10/09/24 17:02	1
Chromium	<0.00500		0.00500		mg/L		10/07/24 09:30	10/09/24 17:02	1
Cobalt	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:02	1
Lithium	<0.0100		0.0100		mg/L		10/07/24 09:30	10/09/24 17:02	1
Lead	<0.000500		0.000500		mg/L		10/07/24 09:30	10/09/24 17:02	1
Molybdenum	<0.00200		0.00200		mg/L		10/07/24 09:30	10/09/24 17:02	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-435317/1-A
Matrix: Water
Analysis Batch: 435770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435317

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	<0.00500		0.00500		mg/L		10/07/24 09:30	10/09/24 17:02	1

Lab Sample ID: MB 310-435317/1-A
Matrix: Water
Analysis Batch: 436234

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435317

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/14/24 17:27	1

Lab Sample ID: MB 310-435317/1-A
Matrix: Water
Analysis Batch: 436697

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435317

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/17/24 12:28	1

Lab Sample ID: MB 310-435317/1-A
Matrix: Water
Analysis Batch: 436802

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435317

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<0.00100		0.00100		mg/L		10/07/24 09:30	10/18/24 13:09	1

Lab Sample ID: LCS 310-435317/2-A
Matrix: Water
Analysis Batch: 435770

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435317

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.200	0.2371		mg/L		119	80 - 120
Arsenic	0.200	0.2242		mg/L		112	80 - 120
Barium	0.100	0.1092		mg/L		109	80 - 120
Beryllium	0.100	0.1030		mg/L		103	80 - 120
Boron	0.200	0.2302		mg/L		115	80 - 120
Cadmium	0.100	0.1047		mg/L		105	80 - 120
Calcium	2.00	1.956		mg/L		98	80 - 120
Chromium	0.100	0.1008		mg/L		101	80 - 120
Cobalt	0.100	0.1168		mg/L		117	80 - 120
Lithium	0.200	0.2143		mg/L		107	80 - 120
Lead	0.200	0.2214		mg/L		111	80 - 120
Molybdenum	0.200	0.2000		mg/L		100	80 - 120
Selenium	0.400	0.4200		mg/L		105	80 - 120

Lab Sample ID: LCS 310-435317/2-A
Matrix: Water
Analysis Batch: 436234

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435317

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	0.100	0.08212		mg/L		82	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-435715/1-A
Matrix: Water
Analysis Batch: 435867

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 435715

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200		mg/L		10/09/24 16:10	10/10/24 11:16	1

Lab Sample ID: LCS 310-435715/2-A
Matrix: Water
Analysis Batch: 435867

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 435715

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001645		mg/L		99	80 - 120

Method: SM 2540C - Solids, Total Dissolved (TDS)

Lab Sample ID: MB 310-435320/1
Matrix: Water
Analysis Batch: 435320

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<50.0		50.0		mg/L			10/04/24 16:18	1

Lab Sample ID: LCS 310-435320/2
Matrix: Water
Analysis Batch: 435320

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids	1000	1026		mg/L		103	88 - 110

Method: SM 4500 H+ B - pH

Lab Sample ID: LCS 310-435110/1
Matrix: Water
Analysis Batch: 435110

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.1		SU		101	98 - 102

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-682413/1-A
Matrix: Water
Analysis Batch: 685736

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 682413

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.128	U	0.0694	0.0694	1.00	0.128	pCi/L	10/07/24 10:04	10/29/24 22:53	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*95.6*		*30 - 110*	*10/07/24 10:04*	*10/29/24 22:53*	*1*

Method: 9315 - Radium-226 (GFPC) (Continued)

Lab Sample ID: LCS 160-682413/2-A
Matrix: Water
Analysis Batch: 685736

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 682413

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			9.58	9.819		1.03	1.00	0.111	pCi/L	103	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*95.9*		*30 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-682414/1-A
Matrix: Water
Analysis Batch: 684310

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 682414

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.561	U	0.362	0.365	1.00	0.561	pCi/L	10/07/24 10:07	10/21/24 12:22	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Barium	*95.6*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:22*	*1*
Y Carrier	*79.6*		*30 - 110*	*10/07/24 10:07*	*10/21/24 12:22*	*1*

Lab Sample ID: LCS 160-682414/2-A
Matrix: Water
Analysis Batch: 684310

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 682414

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.41	8.711		1.22	1.00	0.511	pCi/L	104	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Barium	*95.9*		*30 - 110*
Y Carrier	*80.0*		*30 - 110*

QC Association Summary

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

HPLC/IC

Analysis Batch: 435819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-3	LS3-1024	Total/NA	Water	9056A	
310-291895-3	LS3-1024	Total/NA	Water	9056A	
MB 310-435819/3	Method Blank	Total/NA	Water	9056A	
LCS 310-435819/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 435853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	9056A	
310-291895-1	LS1-1024	Total/NA	Water	9056A	
310-291895-2	LS2-1024	Total/NA	Water	9056A	
310-291895-2	LS2-1024	Total/NA	Water	9056A	
MB 310-435853/3	Method Blank	Total/NA	Water	9056A	
LCS 310-435853/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 435317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	3005A	
310-291895-2	LS2-1024	Total/NA	Water	3005A	
310-291895-3	LS3-1024	Total/NA	Water	3005A	
MB 310-435317/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-435317/2-A	Lab Control Sample	Total/NA	Water	3005A	

Prep Batch: 435715

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	7470A	
310-291895-2	LS2-1024	Total/NA	Water	7470A	
310-291895-3	LS3-1024	Total/NA	Water	7470A	
MB 310-435715/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-435715/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 435770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	6020B	435317
310-291895-2	LS2-1024	Total/NA	Water	6020B	435317
310-291895-3	LS3-1024	Total/NA	Water	6020B	435317
MB 310-435317/1-A	Method Blank	Total/NA	Water	6020B	435317
LCS 310-435317/2-A	Lab Control Sample	Total/NA	Water	6020B	435317

Analysis Batch: 435867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	7470A	435715
310-291895-2	LS2-1024	Total/NA	Water	7470A	435715
310-291895-3	LS3-1024	Total/NA	Water	7470A	435715
MB 310-435715/1-A	Method Blank	Total/NA	Water	7470A	435715
LCS 310-435715/2-A	Lab Control Sample	Total/NA	Water	7470A	435715

Analysis Batch: 436234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	6020B	435317

Metals (Continued)

Analysis Batch: 436234 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-2	LS2-1024	Total/NA	Water	6020B	435317
310-291895-3	LS3-1024	Total/NA	Water	6020B	435317
MB 310-435317/1-A	Method Blank	Total/NA	Water	6020B	435317
LCS 310-435317/2-A	Lab Control Sample	Total/NA	Water	6020B	435317

Analysis Batch: 436382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	6020B	435317
310-291895-2	LS2-1024	Total/NA	Water	6020B	435317
310-291895-3	LS3-1024	Total/NA	Water	6020B	435317

Analysis Batch: 436697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-435317/1-A	Method Blank	Total/NA	Water	6020B	435317

Analysis Batch: 436802

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 310-435317/1-A	Method Blank	Total/NA	Water	6020B	435317

General Chemistry

Analysis Batch: 435110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	SM 4500 H+ B	
310-291895-2	LS2-1024	Total/NA	Water	SM 4500 H+ B	
310-291895-3	LS3-1024	Total/NA	Water	SM 4500 H+ B	
LCS 310-435110/1	Lab Control Sample	Total/NA	Water	SM 4500 H+ B	

Analysis Batch: 435320

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	SM 2540C	
310-291895-2	LS2-1024	Total/NA	Water	SM 2540C	
310-291895-3	LS3-1024	Total/NA	Water	SM 2540C	
MB 310-435320/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-435320/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Rad

Prep Batch: 682413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	PrecSep-21	
310-291895-2	LS2-1024	Total/NA	Water	PrecSep-21	
310-291895-3	LS3-1024	Total/NA	Water	PrecSep-21	
MB 160-682413/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-682413/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 682414

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-291895-1	LS1-1024	Total/NA	Water	PrecSep_0	
310-291895-2	LS2-1024	Total/NA	Water	PrecSep_0	
310-291895-3	LS3-1024	Total/NA	Water	PrecSep_0	
MB 160-682414/1-A	Method Blank	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 682414 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 160-682414/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS1-1024
Lab Sample ID: 310-291895-1
Date Collected: 10/02/24 10:55
Matrix: Water
Date Received: 10/03/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	435853	HE7K	EET CF	10/09/24 10:50
Total/NA	Analysis	9056A		200	435853	HE7K	EET CF	10/09/24 11:02
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		1	435770	NFT2	EET CF	10/09/24 17:52
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		4	436234	NFT2	EET CF	10/14/24 17:50
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		4	436382	NFT2	EET CF	10/15/24 12:50
Total/NA	Prep	7470A			435715	QTZ5	EET CF	10/09/24 16:10
Total/NA	Analysis	7470A		1	435867	QTZ5	EET CF	10/10/24 12:09
Total/NA	Analysis	SM 2540C		1	435320	MDU9	EET CF	10/04/24 16:18
Total/NA	Analysis	SM 4500 H+ B		1	435110	W9YR	EET CF	10/03/24 10:54
Total/NA	Prep	PrecSep-21			682413	MLT	EET SL	10/07/24 10:04
Total/NA	Analysis	9315		1	685625	CMM	EET SL	10/29/24 22:56
Total/NA	Prep	PrecSep_0			682414	MLT	EET SL	10/07/24 10:07
Total/NA	Analysis	9320		1	684310	FLC	EET SL	10/21/24 12:23
Total/NA	Analysis	Ra226_Ra228		1	686003	FLC	EET SL	10/30/24 15:56

Client Sample ID: LS2-1024
Lab Sample ID: 310-291895-2
Date Collected: 10/02/24 10:30
Matrix: Water
Date Received: 10/03/24 09:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	435853	HE7K	EET CF	10/09/24 11:14
Total/NA	Analysis	9056A		50	435853	HE7K	EET CF	10/09/24 11:26
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		1	435770	NFT2	EET CF	10/09/24 17:54
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		4	436234	NFT2	EET CF	10/14/24 17:53
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		4	436382	NFT2	EET CF	10/15/24 12:52
Total/NA	Prep	7470A			435715	QTZ5	EET CF	10/09/24 16:10
Total/NA	Analysis	7470A		1	435867	QTZ5	EET CF	10/10/24 12:11
Total/NA	Analysis	SM 2540C		1	435320	MDU9	EET CF	10/04/24 16:18
Total/NA	Analysis	SM 4500 H+ B		1	435110	W9YR	EET CF	10/03/24 10:55
Total/NA	Prep	PrecSep-21			682413	MLT	EET SL	10/07/24 10:04
Total/NA	Analysis	9315		1	685625	CMM	EET SL	10/29/24 23:00
Total/NA	Prep	PrecSep_0			682414	MLT	EET SL	10/07/24 10:07
Total/NA	Analysis	9320		1	684310	FLC	EET SL	10/21/24 12:23
Total/NA	Analysis	Ra226_Ra228		1	686003	FLC	EET SL	10/30/24 15:56

Lab Chronicle

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Client Sample ID: LS3-1024
Date Collected: 10/02/24 11:10
Date Received: 10/03/24 09:15

Lab Sample ID: 310-291895-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	435819	ZRI4	EET CF	10/08/24 16:56
Total/NA	Analysis	9056A		50	435819	ZRI4	EET CF	10/08/24 17:08
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		1	435770	NFT2	EET CF	10/09/24 17:57
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		1	436234	NFT2	EET CF	10/14/24 17:55
Total/NA	Prep	3005A			435317	F5MW	EET CF	10/07/24 09:30
Total/NA	Analysis	6020B		1	436382	NFT2	EET CF	10/15/24 12:54
Total/NA	Prep	7470A			435715	QTZ5	EET CF	10/09/24 16:10
Total/NA	Analysis	7470A		1	435867	QTZ5	EET CF	10/10/24 12:14
Total/NA	Analysis	SM 2540C		1	435320	MDU9	EET CF	10/04/24 16:18
Total/NA	Analysis	SM 4500 H+ B		1	435110	W9YR	EET CF	10/03/24 10:56
Total/NA	Prep	PrecSep-21			682413	MLT	EET SL	10/07/24 10:04
Total/NA	Analysis	9315		1	685625	CMM	EET SL	10/29/24 23:00
Total/NA	Prep	PrecSep_0			682414	MLT	EET SL	10/07/24 10:07
Total/NA	Analysis	9320		1	684310	FLC	EET SL	10/21/24 12:24
Total/NA	Analysis	Ra226_Ra228		1	686003	FLC	EET SL	10/30/24 15:56

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: GHD Services Inc. Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Water	Lithium

Laboratory: Eurofins St. Louis

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-25
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-25
HI - RadChem Recognition	State	n/a	06-30-25
Illinois	NELAP	200023	11-30-25
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-25
Massachusetts	State	M-MO054	06-30-25
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-25
New Jersey	NELAP	MO002	06-30-25
New Mexico	State	MO00054	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-25
North Dakota	State	R-207	12-31-24
Oregon	NELAP	4157	09-01-25
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-25
Texas	NELAP	T104704193	07-31-25
US Fish & Wildlife	US Federal Programs	058448	07-31-25
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-25
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-25
West Virginia DEP	State	381	10-31-25

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
SM 4500 H+ B	pH	SM	EET CF
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

None = None

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-291895 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information				
Client: GHD				
City/State:	CITY Des Moines	STATE IA	Project:	
Receipt Information				
Date/Time Received:	DATE 10/3/24	TIME 915	Received By: PH	
Delivery Type: ☐ UPS ☑ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee ☐ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____				
Condition of Cooler/Containers				
Sample(s) received in Cooler?	☑ Yes	☐ No	*If yes:* Cooler ID:	
Multiple Coolers?	☐ Yes	☑ No	*If yes:* Cooler # _____ of _____	
Cooler Custody Seals Present? No	☐ Yes	☑ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No	
Sample Custody Seals Present? No	☐ Yes	☑ No	*If yes:* Sample custody seals intact? ☐ Yes ☐ No	
Trip Blank Present?	☐ Yes	☑ No	*If yes:* Which VOA samples are in cooler? ↓	
Temperature Record				
Coolant: ☑ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE				
Thermometer ID: 4			Correction Factor (°C): 0	
• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature				
Uncorrected Temp (°C): 3.6			Corrected Temp (°C): 3.6	
• **Sample Container Temperature**				
Container(s) used:	CONTAINER 1		CONTAINER 2	
Uncorrected Temp (°C):				
Corrected Temp (°C):				
Exceptions Noted				
1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No				
2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No				
NOTE: If yes, contact PM before proceeding If no, proceed with login				
Additional Comments				
DP-02				

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Fax (319) 277-2425

Chain of Custody Record

TestAmerica Des Moines SC
214

Client Information	Sampler: Brooke Wasson / Paige Richards	Lab PM: Zach Bindert	Carrier Tracking No(s):	COC No:
Client Contact: Kevin Armstrong	Phone: 515-414-3933	E-Mail: Zach.Bindert@ET.EurofinsUS.com		Page: 1 of 1
Company: GHD Services Inc.				Job #:
Address: 11228 Aurora Avenue	Due Date Requested:			
City: Des Moines	TAT Requested (days): Standard			
State, Zip: IA, 50322-7905				
Phone: 515-414-3935	PO #: 340-016858			
Email: Kevin.Armstrong@ghd.com	WO #:			
Project Name: MidAmerican WSEC CCR Monofill Leachate	Eurofins Project #: 31017236			
Project Number: 12592594 DEL.001	SSOW#: 12592594-002			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Rad226/Rad228/Rad228/228 combined	6020A CCR Metals List, 7470A Mercury	2540C TDS	9056A Chloride, Fluoride, Sulfate	SM4500_H+ pH								Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	N	N									
LS1-1024	10/2/24	1055	G	W	N	N	X	X	X	X	X								3	
LS2-1024	10/2/24	1030	G	W	N	N	X	X	X	X	X								3	
LS3-1024	10/2/24	1110	G	W	N	N	X	X	X	X	X								3	

PR PR

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ■ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ■ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements: Database Facility Code GD-MidAmerican-01723

Empty Kit Relinquished by:	Date:	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Paige Richards	10/2/24 1500	GHD	PH	10/3/24 915	
2						
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: GHD Services Inc.

Job Number: 310-291895-1

Login Number: 291895
List Number: 1
Creator: Hirsch, Preston

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.		
The cooler's custody seal, if present, is intact.		
Sample custody seals, if present, are intact.		
The cooler or samples do not appear to have been compromised or tampered with.		
Samples were received on ice.		
Cooler Temperature is acceptable.		
Cooler Temperature is recorded.		
COC is present.		
COC is filled out in ink and legible.		
COC is filled out with all pertinent information.		
Is the Field Sampler's name present on COC?		
There are no discrepancies between the containers received and the COC.		
Samples are received within Holding Time (excluding tests with immediate HTs)		
Sample containers have legible labels.		
Containers are not broken or leaking.		
Sample collection date/times are provided.		
Appropriate sample containers are used.		
Sample bottles are completely filled.		
Sample Preservation Verified.		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		

Tracer/Carrier Summary

Client: GHD Services Inc.
Job ID: 310-291895-1
Project/Site: MidAmerican WSEC CCR Monofill Leachate

Method: 9315 - Radium-226 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
310-291895-1	LS1-1024	87.4
310-291895-2	LS2-1024	80.2
310-291895-3	LS3-1024	85.3
LCS 160-682413/2-A	Lab Control Sample	95.9
MB 160-682413/1-A	Method Blank	95.6

Tracer/Carrier Legend

Ba = Barium

Method: 9320 - Radium-228 (GFPC)

Matrix: Water **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
310-291895-1	LS1-1024	87.4	79.3
310-291895-2	LS2-1024	80.2	72.1
310-291895-3	LS3-1024	85.3	79.3
LCS 160-682414/2-A	Lab Control Sample	95.9	80.0
MB 160-682414/1-A	Method Blank	95.6	79.6

Tracer/Carrier Legend

Ba = Barium
Y = Y Carrier

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→ The Power of Commitment