



2023 Annual Groundwater Monitoring and Corrective Action Report

WEC Temporary Ash Disposal Area

Whelan Energy Center
Public Power Generation Agency/
City of Hastings Utilities



Hastings, Nebraska
January 26, 2024



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Professional Engineer Certification

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am duly licensed Professional Engineer under the laws of the State of Nebraska.

Print Name: Lori J. Calub
Signature: *Lori J. Calub*
Date: 1-26-2024
License #: E-9881

My license renewal date is December 31, 2025.





Table of Contents

Executive Summary	2
1 Introduction	4
1.1 Purpose	4
1.2 Facility Information	4
1.3 Transition of Monitoring Programs	5
2 Monitoring Program Summary	5
2.1 Groundwater Monitoring Network Condition Assessment	5
2.2 Groundwater Purging and Sampling	6
2.3 Groundwater Elevations & Flow Direction	6
2.4 Detection Monitoring Program Results	6
2.5 Assessment Monitoring Program Results	6
2.6 Statistical Analysis Results	7
2.7 Other Information Required under 40 CFR §257.90-98	7
3 Key Activities for Upcoming Year	7

List of Figures

Figure 1. WEC CCR Facility and Monitoring Well Locations

Figure 2. WEC CCR Facility Groundwater Contour Spring 2023

Figure 3. WEC CCR Facility Groundwater Contour Fall 2023

List of Tables

Table 1. Groundwater Monitoring System

Table 2. Groundwater Sampling Event Summary

Table 3. Groundwater Elevations

Table 4. Appendix III Constituents in Groundwater

Table 5. Appendix IV Constituents in Groundwater

Table 6. Background Threshold Values for Assessment Monitoring

Table 7. Established Groundwater Protection Standards

List of Appendices

Appendix A. Field Sampling Forms

Appendix B. Analytical Laboratory Reports

Appendix C. Spring and Fall 2023 Statistical Analysis Memos



Summary of 40 CFR Section § 257.90(e)(6) Groundwater Monitoring System Requirements and Site-Specific Compliance		
§ 257.90(e)(6) A section at the beginning of the annual report that provides an overview of the current status of groundwater monitoring and corrective action programs for the CCR unit. At a minimum, the summary must specify all of the following:		WEC Temporary Ash Disposal Area
§257.90(e)(6)(i)	At the start of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95.	Assessment Monitoring Program
§257.90(e)(6)(ii)	At the end of the current annual reporting period, whether the CCR unit was operating under the detection monitoring program in § 257.94 or the assessment monitoring program in § 257.95.	Assessment Monitoring Program
§257.90(e)(6)(iii)	If it was determined that there was a statistically significant increase over background for one or more constituents listed in Appendix III to this part pursuant to § 257.94(e):	Yes
§257.90(e)(6)(iii)(A)	Identify those constituents listed in Appendix III to this part and the names of the monitoring wells associated with such an increase.	• MW-2B – Calcium • MW-3R – Sulfate
§257.90(e)(6)(iii)(B)	Provide the date when the assessment monitoring program was initiated for the CCR unit.	July 2018
§257.90(e)(6)(iv)	If it was determined that there was a statistically significant level above the groundwater protection standard for one or more constituents listed in Appendix IV to this part pursuant to § 257.95(g) include all of the following:	No SSLs
§257.90(e)(6)(iv) (A)	Identify those constituents listed in Appendix IV to this part and the names of the monitoring wells associated with such an increase.	N/A
§257.90(e)(6)(iv) (B)	Provide the date when the assessment of corrective measures was initiated for the CCR unit.	N/A
§257.90(e)(6)(iv)(C)	Provide the date when the public meeting was held for the assessment of corrective measures for the CCR unit.	N/A
§257.90(e)(6)(iv)(D)	Provide the date when the assessment of corrective measures was completed for the CCR unit.	N/A
§257.90(e)(6)(v)	Whether a remedy was selected pursuant to § 257.97 during the current annual reporting period, and if so, the date of remedy selection.	N/A
§257.90(e)(6)(vi)	(vi) Whether remedial activities were initiated or are ongoing pursuant to § 257.98 during the current annual reporting period.	N/A



Executive Summary

Hastings Utilities, City of Hastings (Hastings) operates an existing fossil fuel combustion ash disposal area that is used exclusively by the Whelan Energy Center (WEC), designated as the WEC Temporary Ash Disposal Area. The WEC is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. The WEC site is a parcel of the historical Hastings Naval Ammunition Depot and is included in the Superfund activities for this subsite. WEC is also downgradient of additional Superfund subsites located in the City of Hastings.

On April 17, 2015, the United States Environmental Protection Agency (U.S. EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the Title 40 United States Code of Federal Regulations (CFR) Part 257. This regulation applies to the existing WEC Temporary Ash Disposal Area operated by Hastings. This annual report covers the WEC Temporary Ash Disposal Area and provides a summary of CCR groundwater monitoring system activities for calendar year 2023 for the assessment monitoring program under 40 CFR §257.95.

The WEC Temporary Ash Disposal Area transitioned from detection to assessment monitoring following the fall 2017 sampling event due to the following statistically significant increases (SSIs) in downgradient monitoring wells: calcium, chloride, sulfate, and total dissolved solids. An alternate source demonstration (ASD), dated May 1, 2018, was prepared to evaluate the published SSIs. The ASD established that the potential for an offsite source of contamination or natural variation in regional groundwater chemistry was supported for several of the SSIs, including calcium, chloride and total dissolved solids; however, this was not supported for sulfate based on the groundwater data available at the time. As a result, Hastings initiated an assessment monitoring program in 2018, as required in the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95. To continue collecting information on groundwater characteristics near the site, several investigative monitoring wells were installed, sampling was conducted, and a conceptual site model was completed in 2019.. Assessment monitoring continued for sampling events in spring and fall 2023. No transition of monitoring programs occurred in 2023.

For the April 2023 sampling event, results of the analysis indicated two (2) SSIs above background for Appendix III constituents and six (6) SSIs above background for Appendix IV constituents.

- Calcium at MW-2B
- Sulfate at MW-3R
- Barium at MW-1
- Barium at MW-2B
- Barium at MW-3R
- Lithium at MW-3R
- Lithium at MW-4B
- Molybdenum at MW-8



For the December 2023 sampling event, results of the analysis indicated two (2) SSLs above background for Appendix III constituents and seven (7) SSLs above background for Appendix IV constituents.

- Calcium at MW-2B
- Sulfate at MW-3R
- Barium at MW-1
- Barium at MW-2B
- Barium at MW-3R
- Lithium at MW-3R
- Lithium at MW-4B
- Radium at MW-1
- Radium at MW-2B

There were no statistically significant levels (SSLs) of the monitored constituents above the groundwater protection standards (GWPS) for either the April 2023 or December 2023 sampling events. Assessment monitoring will continue with the next event tentatively scheduled for spring 2024.



1 Introduction

On April 17, 2015, the United States Environmental Protection Agency (U.S. EPA) published the final rule for the regulation and management of coal combustion residuals (CCR) under the Resource Conservation and Recovery Act (RCRA). The CCR rule is formally promulgated in the Title 40 United States Code of Federal Regulations (CFR) Parts 257 and 261. This regulation applies to the existing Whelan Energy Center (WEC) Temporary Ash Disposal Area operated by Hastings Utilities, City of Hastings, Nebraska (Hastings).

1.1 Purpose

The CCR rule established requirements for annual reporting of groundwater monitoring and corrective action in 40 CFR §257.90. The information included in this report complies with the requirements established in 40 CFR §257.90(e). This report provides a summary of CCR-related groundwater activities for calendar year 2023.

1.2 Facility Information

Hastings operates an existing fossil fuel combustion ash disposal area that is used exclusively by the WEC (designated as the WEC Temporary Ash Disposal Area). The WEC is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. The WEC site is a parcel located within the historical Hastings Naval Ammunition Depot (NAD) and as such is included in the Superfund activities for this subsite of the Hastings Groundwater Contamination Superfund Site. The Superfund actions include groundwater and soil restoration. Buried byproducts of NAD have historically been found on the site. NAD extends south, east, and west of the site. The WEC is also downgradient of the various Superfund sites and subsites of the Hastings Groundwater Contamination Superfund Site located in the City of Hastings. These sites include, but are not limited to, the Colorado Avenue Subsite, Second Street Subsite, North Landfill Subsite, and the Far-Mar-Co Subsite.

WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is an existing unlined CCR surface impoundment of approximately 23.2 acres and serves the two fossil fuel combustion units. Approximately 6.1 acres of the WEC Temporary Ash Disposal Area was under construction for a composite liner (landfill cell and leachate pond) during fall 2023.

CCR disposal at this site began in 1981, the same year that commercial operation of WEC1 began. Fossil fuel bottom ash and fly ash mixture (pond ash) from WEC1 is currently sluiced to the WEC Temporary Ash Disposal Area. Commercial operation of WEC2 began on May 1, 2011. Fly ash from the WEC2 silo is direct loaded into trucks for off-site beneficial use. WEC2 bottom ash is hauled in dump trucks and stockpiled within the limits of the disposal area. Scrubber ash from WEC2 is moisture conditioned and hauled to the disposal area. The sluiced pond ash and scrubber ash are kept apart in the WEC Temporary Ash Disposal Area by a separation berm. Hastings has marketed and utilized the CCR for beneficial reuse. The intent is

to manage the CCR within the WEC Temporary Ash Disposal Area permitted limits and balance production with excavation for beneficial reuse.

1.3 Transition of Monitoring Programs

The following statistically significant increases (SSIs) were detected and reported in the 2017 WEC CCR Annual Groundwater Report in downgradient monitoring wells at the WEC Temporary Ash Disposal Area: calcium, chloride, sulfate, and total dissolved solids. An alternate source demonstration (ASD) was conducted for the published SSIs (dated May 1, 2018). The ASD established that the potential for an offsite source of contamination or natural variation in regional groundwater chemistry was supported for several of the SSIs, including calcium, chloride, and total dissolved solids; however, this was not supported for sulfate based on the groundwater data available at the time. As a result, Hastings initiated an assessment monitoring program in 2018, as required in the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95. To continue collecting information on groundwater characteristics near the site, several investigative monitoring wells were installed, sampling was conducted, and a conceptual site model was completed in 2019. Assessment monitoring continued for sampling events in spring and fall 2023. No transition of monitoring programs occurred in 2023.

2 Monitoring Program Summary

The groundwater monitoring system currently consists of nine monitoring wells. Monitoring well details for the monitoring network, including the date of installation, are provided in **Table 1**. The locations of the monitoring wells in the groundwater monitoring program with respect to the WEC Temporary Ash Disposal Area are shown in **Figure 1**. Based on historical data collected at the site during Nebraska Department of Environment and Energy (NDEE) Title 132 semiannual monitoring, monitoring wells upgradient of the CCR unit (current background wells) include MW-5B, MW-6, and MW-9, and downgradient monitoring wells include MW-1, MW-2B, MW-3R, MW-4B, MW-7, and MW-8.

2.1 Groundwater Monitoring Network Condition Assessment

Hastings Utilities personnel evaluated the condition of each monitoring well in the groundwater monitoring system during the semiannual sampling events in April 2023 and December 2023. The wells were noted in good working condition, concrete pads were intact, and no damage was observed to the protective well casings, except for MW-4B. The protective cover on MW-4B was rusted at the time of sampling. Site maintenance staff made modifications to reweld and secure the lid on the same day that the issue was observed. The pump at MW-3R was not working during the December 2023 sampling event, and a spare pump was obtained and used to collect the sample on a separate day. No wells were added or abandoned from the certified monitoring well network in 2023.

2.2 Groundwater Purging and Sampling

Groundwater sampling events were conducted by Hastings Utilities personnel in April 2023 and December 2023 at the site's CCR monitoring well network. Samples were collected in compliance with 40 CFR §257.90(c), which requires groundwater monitoring be conducted throughout the active life and post-closure care period of the CCR unit for wells in the monitoring network. The number of samples collected for each background and downgradient well during each groundwater sample event, whether the sample was required by detection or assessment monitoring programs, and the date of each event is summarized in **Table 2**.

Groundwater sampling was conducted by Hastings Utilities personnel in accordance with the WEC Temporary Ash Disposal Area's Groundwater Sampling and Analysis Plan (SAP) dated October 2016, revised on February 21, 2020, and further revised with the NDEE Title 132 permit renewal on August 6, 2021. The monitoring wells were purged and sampled with dedicated Geotech SS Geosub pumps and controllers in the monitoring wells under low-flow sampling conditions except for MW-3R, which was sampled with a spare pump as noted in **Section 2.1**. A calibrated water quality meter was used to monitor field parameters, including pH, temperature, turbidity, dissolved oxygen (DO), oxidation-reduction potential (ORP), and conductivity. Field sampling forms for the April 2023 and December 2023 sampling events are provided in **Appendix A**. After the water quality parameters stabilized, groundwater samples were collected and placed into iced coolers under chain-of-custody control pending delivery to the laboratories. Groundwater samples were analyzed by Eurofins Environment Testing (Eurofins). The laboratory analytical reports are provided in **Appendix B**.

2.3 Groundwater Elevations & Flow Direction

Static groundwater level measurements were recorded at the monitoring wells listed in **Table 1** prior to purging and sampling activities conducted during the groundwater sampling events. Groundwater measurements were used to determine groundwater elevations for monitoring wells (**Table 3**). Groundwater flow observed during the two assessment monitoring sampling events was to the northeast with an average flow velocity of 1.85 ft/day to 2.82 ft/day during the spring sampling event and 1.59 ft/day to 2.43 ft/day during the fall sampling event, which is consistent with historical data observed from 2007 to 2022 (see **Figures 2 and 3**).

2.4 Detection Monitoring Program Results

The results of background sampling events in November 2016 through June 2017 and the detection and assessment monitoring activities in October 2017 through December 2023 for Appendix III and Appendix IV constituents are presented in **Table 4** and **Table 5**.

2.5 Assessment Monitoring Program Results

The WEC Temporary Ash Disposal Area transitioned from the detection monitoring program to the assessment monitoring program following the ASD dated May 1, 2018. Groundwater sampling was completed as part of an assessment monitoring program for the WEC CCR unit in July 2018, as specified in 40 CFR §257.95(b), and October 2018, as specified in 40 CFR §257.95(d). The July and October 2018 sampling events were analyzed for the full Appendix III



and Appendix IV constituent lists in accordance with 40 CFR §257.95(b) and 40 CFR §257.95(d). Semiannual sampling for the assessment monitoring program has continued through 2023. Samples were collected in accordance with 40 CFR §257.90(e). The samples were analyzed for all constituents from the Appendix III and IV lists during the April 2023 and December 2023 sampling events. The results of the assessment monitoring events for April 2023 and December 2023 are presented in **Table 4** and **Table 5**.

2.6 Statistical Analysis Results

Statistically derived background threshold values (BTVs) for Appendix III and Appendix IV constituents for assessment monitoring are provided in **Table 6**. Sampling results used to calculate BTVs were obtained during monitoring events conducted between November 2016 and November 2022. Background data sets will be evaluated for updates every two years or during monitoring program transition, as recommended by the U.S. EPA's Unified Guidance, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (2009) and in accordance with the facility's SAP. The next background update will occur in fall 2024. As a result of entering the assessment monitoring program, groundwater protection standards (GWPS) were established for all detected Appendix IV constituents. The GWPS were established in accordance with 40 CFR §257.95(h) and are presented in **Table 7**.

Spring and fall 2023 statistical analysis memos are included in **Appendix C**. The memos include a summary of the BTVs for the Appendix III and IV constituents in assessment monitoring. The memos also contain the results of statistical evaluation for SSIs above background and statistically significant levels (SSLs) above the GWPS at downgradient monitoring wells. No SSLs were identified.

2.7 Other Information Required under 40 CFR §257.90-98

No other information is required under 40 CFR §257.90 through 40 CFR §257.98 at this time.

3 Key Activities for Upcoming Year

In 2024, all wells in the CCR groundwater monitoring network will be sampled at least semiannually, in accordance with the assessment monitoring program requirements (40 CFR §257.95). Analytical results will be evaluated for SSIs above background and for SSLs above the GWPS in spring and fall 2024.



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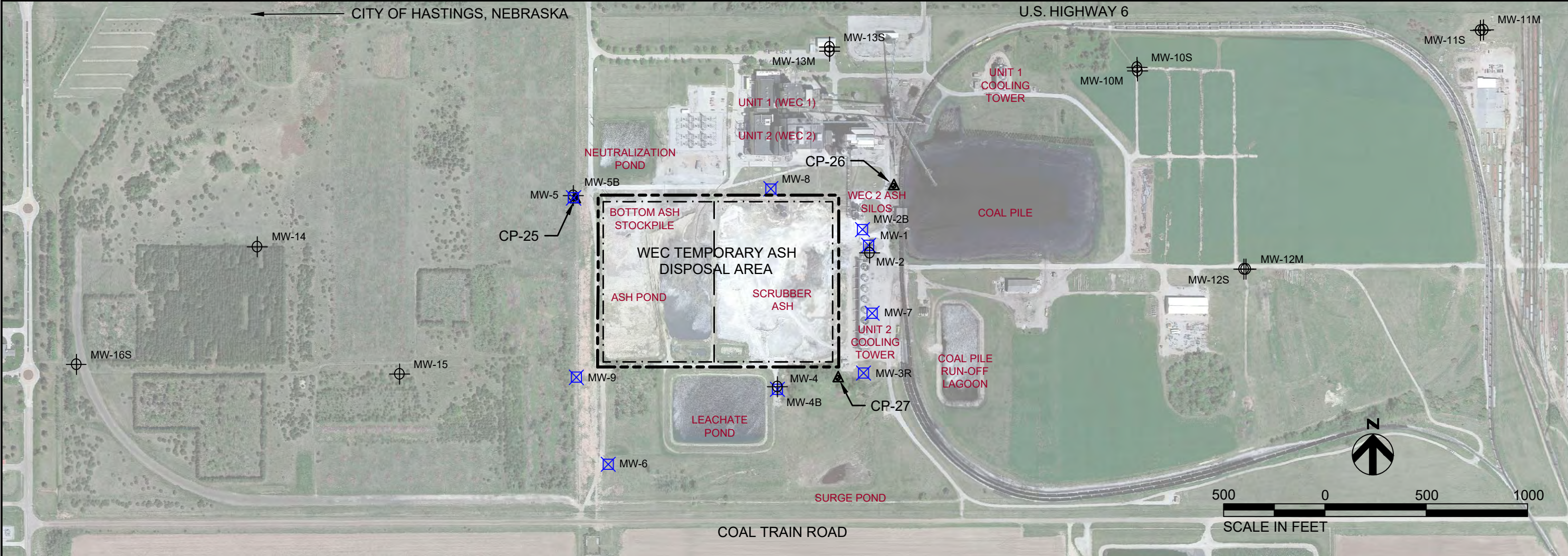


Figures



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GROUNDWATER MONITORING WELLS					
WELL DESIGNATION	NORTHING	EASTING	TOP OF CASING ELEVATION*	GROUND ELEVATION*	COMMENT
MW-1	334585.29	2330340.91	1903.16	1900.68	ASSESSMENT MONITORING WELL
MW-2	334549.00	2330345.01	1903.18	1900.93	DRY
MW-2B	334663.85	2330310.77	1903.43	1900.60**	ASSESSMENT MONITORING WELL
MW-3R	333955.95	2330316.80	1900.76	1897.98	ASSESSMENT MONITORING WELL
MW-4	333888.31	2329891.68	1899.21	1895.19	DRY
MW-4B	333876.00	2329890.22	1897.55	1894.69**	ASSESSMENT MONITORING WELL
MW-5	334830.77	2328882.44	1898.90	1897.60	DRY
MW-5B	334819.84	2328884.33	1899.84	1897.21**	UPGRADIENT/BACKGROUND WELL
MW-6	333507.64	2329055.42	1896.88	1893.54	UPGRADIENT/BACKGROUND WELL
MW-7	334250.89	2330359.26	1901.79	1899.14**	ASSESSMENT MONITORING WELL
MW-8	334864.54	2329857.95	1903.93	1901.05**	ASSESSMENT MONITORING WELL
MW-9	333935.57	2328898.85	1897.11	1894.31**	DETECTION MONITORING WELL
MW-10S	334585.29	2330340.91	1904.84	1904.16	DELINEATION WELL
MW-10M	334549.00	2330345.01	1905.18	1902.16	DELINEATION WELL
MW-11S	334663.85	2330310.77	1899.69	1897.13	DELINEATION WELL
MW-11M	333955.95	2330316.80	1899.66	1897.13	DELINEATION WELL
MW-12S	333888.31	2329891.68	1910.39	1907.3	DELINEATION WELL
MW-12M	333876.00	2329890.22	1910.15	1907.56	DELINEATION WELL
MW-13S	334830.77	2328882.44	1904.89	1902.34	DELINEATION WELL
MW-13M	334819.84	2328884.33	1905.04	1902.40	DELINEATION WELL
MW-14	333507.64	2329055.42	1897.46	1894.74	DELINEATION WELL
MW-15****	334250.89	2330359.26	1897.64	1895.32	DELINEATION WELL
MW-16S****	333931.96	2326197.40	1897.50	1894.88	DELINEATION WELL

* TOP OF CASING AND GROUND ELEVATIONS PROVIDED BY HASTINGS UTILITIES JULY 23, 2019.
** DESIGNATED GROUND ELEVATIONS DEPICT THE ELEVATION OF THE TOP OF THE CONCRETE SLAB NEAREST TO THE CASING ON THE NORTH SIDE.
***NORTHING AND EASTING COORDINATES ARE APPROXIMATIONS AND WILL BE UPDATED ALONG WITH TOC AND GROUND SURFACE ELEVATIONS DURING THE NEXT SITE SURVEY.
****MW-15 WAS ABANDONED ON JULY 26, 2022, AND WAS REPLACED WITH MW-16S ON JULY 27, 2022.

NOTES:
1. AERIAL DATED 8/27/2017 OBTAINED FROM GOOGLE EARTH.

CONTROLS	NORTHING	EASTING	ELEVATION	LONG DESCRIPTION
25	334815.14	2328892.86	1896.51	BRASS CAP
26	334879.51	2330467.21	1900.86	BRASS CAP
27	333932.07	2330190.86	1894.46	BRASS CAP

*NOTE: STATE PLANE CONTROL IS BASED ON NEBRASKA SOUTH ZONE NAD 27. VERTICAL CONTROL IS BASED ON NGVD29.

LEGEND

MONITORING WELL

CCR MONITORING WELL

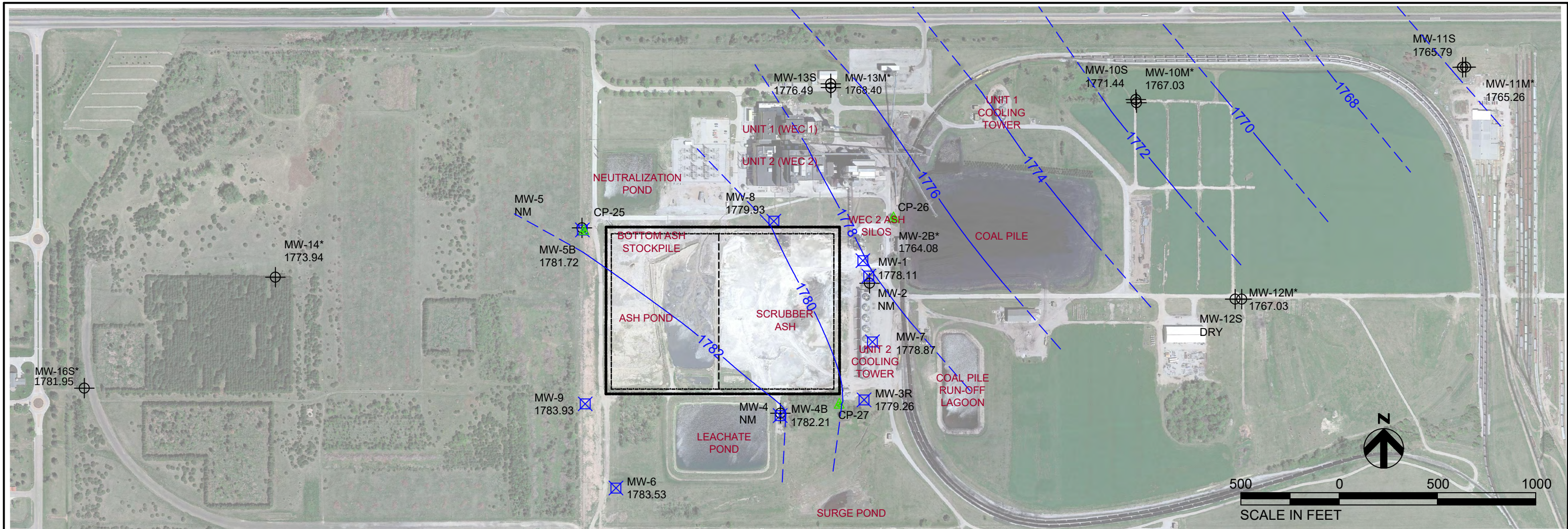
CONTROL POINT

ASH DISPOSAL AREA BOUNDARY

ORIGINAL TOE OF SLOPE

SEPARATION BERM

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GROUNDWATER MONITORING WELLS					
WELL DESIGNATION	NORTHING	EASTING	TOP OF CASING ELEVATION*	GROUND ELEVATION*	COMMENT
MW-1	334585.29	2330340.91	1903.16	1900.68	ASSESSMENT MONITORING WELL
MW-2	334549.00	2330345.01	1903.18	1900.93	DRY
MW-2B	334663.85	2330310.77	1903.43	1900.60**	ASSESSMENT MONITORING WELL
MW-3R	333955.95	2330316.80	1900.76	1897.98	ASSESSMENT MONITORING WELL
MW-4	333888.31	2329891.68	1899.21	1895.19	DRY
MW-4B	333876.00	2329890.22	1897.55	1894.69**	ASSESSMENT MONITORING WELL
MW-5	334830.77	2328882.44	1898.90	1897.60	DRY
MW-5B	334819.84	2328884.33	1899.84	1897.21**	UPGRADIENT/BACKGROUND WELL
MW-6	333507.64	2329055.42	1896.88	1893.54	UPGRADIENT/BACKGROUND WELL
MW-7	334250.89	2330359.26	1901.79	1899.14**	ASSESSMENT MONITORING WELL
MW-8	334864.54	2329857.95	1903.93	1901.05**	ASSESSMENT MONITORING WELL
MW-9	333935.57	2328898.85	1897.11	1894.31**	UPGRADIENT/BACKGROUND WELL
MW-10S	334585.29	2330340.91	1904.84	1904.16	DELINEATION WELL
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MW-11M	333955.95	2330316.80	1899.66	1897.13	DELINEATION WELL
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MW-14	333507.64	2329055.42	1897.46	1894.74	DELINEATION WELL
MW-16S****	333931.96	2326197.40	1897.50	1894.88	DELINEATION WELL

* TOP OF CASING AND GROUND ELEVATIONS PROVIDED BY HASTINGS UTILITIES JULY 23, 2019.
** DESIGNATED GROUND ELEVATIONS DEPICT THE ELEVATION OF THE TOP OF THE CONCRETE SLAB NEAREST TO THE CASING ON THE NORTH SIDE.
*** NORTHING AND EASTING COORDINATES ARE APPROXIMATIONS AND WILL BE UPDATED ALONG WITH TOC AND GROUND SURFACE ELEVATIONS DURING THE NEXT SITE SURVEY.
**** MW-15 WAS ABANDONED ON JULY 26, 2022, AND WAS REPLACED WITH MW-16S ON JULY 27, 2022.

- NOTES:
- AERIAL DATED APRIL 2022 OBTAINED FROM GOOGLE EARTH.
 - RISER ELEVATIONS PROVIDED BY HASTINGS UTILITIES.
 - TOP OF CASING ELEVATIONS UTILIZED TO DETERMINE GROUNDWATER ELEVATIONS SURVEYED ON JULY 23, 2019.
 - * DENOTES WELLS WERE NOT UTILIZED IN PRODUCTION OF GROUNDWATER CONTOUR DUE TO SCREEN INTERVALS DEEPER THAN THE UPPERMOST AQUIFER OR ANOMALOUS READING.
 - NM - MONITORING WELL WAS STATIC WATER LEVEL WAS NOT MEASURED.

CONTROLS	NORTHING	EASTING	ELEVATION	LONG DESCRIPTION
25	334815.14	2328892.86	1896.51	BRASS CAP
26	334879.51	2330467.21	1900.86	BRASS CAP
27	333932.07	2330190.86	1894.46	BRASS CAP

*NOTE: STATE PLANE CONTROL IS BASED ON NEBRASKA SOUTH ZONE NAD 27. VERTICAL CONTROL IS BASED ON NGVD29.

VELOCITY COMPUTATIONS

TRACER VELOCITY = $V_T = \frac{K_i}{n}$

K = HYDRAULIC CONDUCTIVITY (SEE TABLE)

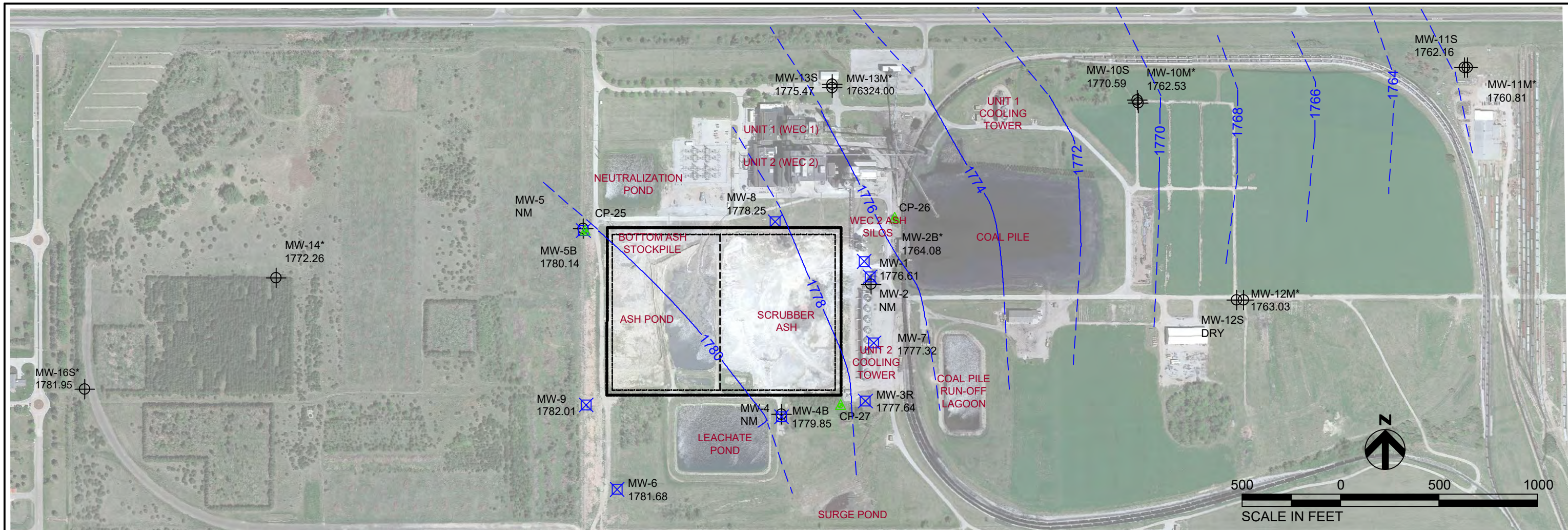
i = GRADIENT = $\frac{1.0 \text{ FT}}{271 \text{ FT}} = 0.00369 \text{ FT/FT}$

n = POROSITY = 0.3

K**	V _T
150 FT/DAY	1.85 FT/DAY
229 FT/DAY	2.82 FT/DAY

- LEGEND
- MONITORING WELL
 - CCR MONITORING WELL
 - CONTROL POINT
 - ASH DISPOSAL AREA BOUNDARY
 - ORIGINAL TOE OF SLOPE
 - GROUNDWATER CONTOUR
 - INFERRED GROUNDWATER CONTOUR

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GROUNDWATER MONITORING WELLS					
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MW-3R	333955.95	2330316.80	1900.76	1897.98	ASSESSMENT MONITORING WELL
MW-4	333888.31	2329891.68	1899.21	1895.19	DRY
MW-4B	333876.00	2329890.22	1897.55	1894.69**	ASSESSMENT MONITORING WELL
MW-5	334830.77	2328882.44	1898.90	1897.60	DRY
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MW-9	333935.57	2328898.85	1897.11	1894.31**	UPGRADIENT/BACKGROUND WELL
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MW-12M	333876.00	2329890.22	1910.15	1907.56	DELINEATION WELL
MW-13S	334830.77	2328882.44	1904.89	1902.34	DELINEATION WELL
MW-13M	334819.84	2328884.33	1905.04	1902.40	DELINEATION WELL
MW-14	333507.64	2329055.42	1897.46	1894.74	DELINEATION WELL
MW-16S****	333931.96	2326197.40	1897.50	1894.88	DELINEATION WELL

* TOP OF CASING AND GROUND ELEVATIONS PROVIDED BY HASTINGS UTILITIES JULY 23, 2019.
** DESIGNATED GROUND ELEVATIONS DEPICT THE ELEVATION OF THE TOP OF THE CONCRETE SLAB NEAREST TO THE CASING ON THE NORTH SIDE.
***NORTHING AND EASTING COORDINATES ARE APPROXIMATIONS AND WILL BE UPDATED ALONG WITH TOC AND GROUND SURFACE ELEVATIONS DURING THE NEXT SITE SURVEY.
****MW-15 WAS ABANDONED ON JULY 26, 2022, AND WAS REPLACED WITH MW-16S ON JULY 27, 2022.

- NOTES:
- AERIAL DATED APRIL 2022 OBTAINED FROM GOOGLE EARTH.
 - RISER ELEVATIONS PROVIDED BY HASTINGS UTILITIES.
 - TOP OF CASING ELEVATIONS UTILIZED TO DETERMINE GROUNDWATER ELEVATIONS SURVEYED ON JULY 23, 2019.
 - * DENOTES WELLS WERE NOT UTILIZED IN PRODUCTION OF GROUNDWATER CONTOUR DUE TO SCREEN INTERVALS DEEPER THAN THE UPPERMOST AQUIFER OR ANOMALOUS READING.
 - NM - MONITORING WELL WAS STATIC WATER LEVEL WAS NOT MEASURED.

CONTROLS	NORTHING	EASTING	ELEVATION	LONG DESCRIPTION
25	334815.14	2328892.86	1896.51	BRASS CAP
26	334879.51	2330467.21	1900.86	BRASS CAP
27	333932.07	2330190.86	1894.46	BRASS CAP

*NOTE: STATE PLANE CONTROL IS BASED ON NEBRASKA SOUTH ZONE NAD 27. VERTICAL CONTROL IS BASED ON NGVD29.

VELOCITY COMPUTATIONS

TRACER VELOCITY = $V_T = \frac{K_i}{n}$

K = HYDRAULIC CONDUCTIVITY (SEE TABLE)

i = GRADIENT = $\frac{1.0 \text{ FT}}{314 \text{ FT}} = 0.003185 \text{ FT/FT}$

n = POROSITY = 0.3

K**	V _T
150 FT/DAY	1.59 FT/DAY
229 FT/DAY	2.43 FT/DAY

- LEGEND
- MONITORING WELL
 - CCR MONITORING WELL
 - CONTROL POINT
 - ASH DISPOSAL AREA BOUNDARY
 - ORIGINAL TOE OF SLOPE
 - GROUNDWATER CONTOUR
 - INFERRED GROUNDWATER CONTOUR

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Tables



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Table 1 - Groundwater Monitoring System

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

Monitoring Well ID	Date Installed	Boring Depth ^[1] (feet bgs)	Well Depth (feet bgs)	Screened Interval (feet bgs)	Location w/ respect to Temporary Ash Disposal Area	Top of Well Casing Elevation ^[4] (ft AMSL)
CCR Monitoring System Network						
MW-5B ^[2]	10/11/2016	122	121	111.0 – 121.0	Upgradient	1899.84
MW-6	10/5/2004	110.5	110	100.0 – 110.0	Upgradient	1896.88
MW-9	10/10/2016	118.5	117	107.0 – 117.0	Upgradient	1897.11
MW-1	7/28/1999	135	134	104.0 – 134.0	Downgradient	1903.16
MW-2B	10/18/2016	162	160	150.0 – 160.0	Downgradient	1903.43
MW-3R	1/29/2011	126.7	111.9	101.9 – 111.9	Downgradient	1900.76
MW-4B ^[3]	10/26/2016	121	119	109.0 – 119.0	Downgradient/Cross-gradient	1897.55
MW-7	10/7/2016	127.2	127	117.0 – 127.0	Downgradient	1901.79
MW-8	10/20/2016	131	127	117.0 – 127.0	Downgradient/Cross-gradient	1903.93
Investigative - Water Level Only Wells						
MW-10S	12/14/2018	144	140	130 - 140	Downgradient/Cross-gradient	1904.84
MW-10M	12/15/2018	190	187	177 - 187	Downgradient/Cross-gradient	1905.18
MW-11S	12/18/2018	154	150	140 - 150	Downgradient	1899.69
MW-11M	12/19/2018	184	184	174-184	Downgradient	1899.66
MW-12S	12/17/2018	144	144	130 - 140	Downgradient/Cross-gradient	1910.39
MW-12M	12/16/2018	177	170	160 - 170	Downgradient/Cross-gradient	1910.15
MW-13S	12/12/2018	154	140	130 - 140	Downgradient/Cross-gradient	1904.89
MW-13M	12/13/2018	191	187	177 - 187	Downgradient/Cross-gradient	1905.04
MW-14	12/11/2018	140	140	130 - 140	Upgradient	1897.46
MW-16S ^[5]	7/27/2022	119	119	109 - 119	Upgradient	1897.50

Notes:^[1] - Gravel pack (16-30 Silica Sand) was utilized to fill annulus between the bottom of the bore hole to approximately 2 feet above the top of screen.^[2] - MW-5B is a replacement well for MW-5 which has not had sufficient water to sample since 2014. MW-5 has not been abandoned; however it is not included in the monitoring well system.^[3] - MW-4B is a replacement well for MW-4 which has not had sufficient water to sample since 2014. MW-4 has not been abandoned; however it is not included in the monitoring well system.^[4] - Top of Well Casing Elevations (TOCs) were updated based on survey as of July 23, 2019.^[5] MW-15 was abandoned on July 26, 2022 and replaced with MW-16S on July 27, 2022.

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Table 2 - Groundwater Sampling Event Summary

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

Monitoring Well ID	# of Initial Background Samples	Initial Background Sample Dates	# of Detection Monitoring Samples	Detection Monitoring Sample Dates ^[1]	# of Assessment Monitoring Samples	Assessment Monitoring Sample Dates
Current background Monitoring Wells^[2]						
MW-5B	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22, 11/14/22, 4/20/23, 12/4/2023
MW-6	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/18/22, 11/14/22, 4/20/23, 12/4/2023
MW-9	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22, 11/14/22, 4/20/23, 12/4/2023
Downgradient Monitoring Wells						
MW-1	8	11/17/2016, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 7/6/2017, 8/8/2017, 9/12/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22 ^[3] , 11/16/22, 4/20/23, 12/5/2023
MW-2B	9	12/21/2016, 1/23/2017, 2/21/2017, 3/23/2017, 4/26/2017, 5/26/2017, 6/27/2017, 8/8/2017, 9/12/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/18/2020, 4/20/21, 12/7/21, 4/25/22, 11/14/22, 4/20/23, 12/5/2023
MW-3R	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22, 11/16/22, 4/21/23, 12/7/2023
MW-4B	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	11/01/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/15/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22, 11/14/22, 4/20/23, 12/5/2023
MW-7	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020, 4/20/21, 12/7/21, 4/25/22 ^[3] , 11/14/22, 4/20/23, 12/5/2023
MW-8	8	11/16/2016, 12/20/2016, 1/23/2017, 2/21/2017, 3/22/2017, 4/26/2017, 5/26/2017, 6/27/2017	2	10/11/2017, 3/07/2018	13	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020, 4/19/21, 12/7/21, 4/25/22, 11/14/22, 4/20/23, 12/5/2023

Notes:^[1] The March 5th - 7th, 2018 sampling event was conducted as part of the Alternate Source Demonstration.^[2] Background monitoring wells are generally upgradient of CCR Unit; however, groundwater direction may fluctuate due to seasonal variation in irrigation and/or production wells use.^[3] Radium was not sampled at MW-1 and MW-7 during the spring 2022 sampling event due to a preservative error made by the lab. Radium at these wells was sampled during the fall 2022 sampling event.

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Table 3 - Groundwater Elevations

Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

CCR Monitoring System Network																		
	MW-1		MW-2B		MW-3R		MW-4B		MW-5B		MW-6		MW-7		MW-8		MW-9	
	TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation	
Historical TOC	1902.93		1902.96		1900.45		1897.02		1899.16		1896.72		1901.23		1903.37		1896.54	
July 2019 TOC	1903.16		1903.43		1900.76		1897.55		1899.84		1896.88		1901.79		1903.93		1897.11	
Date	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)	Measured Depth to Water (ft)	GW Elevation (AMSL)
11/16/2016	123.65	1779.28	135.65	1767.31	120.10	1780.35	113.28	1783.74	117.31	1781.85	112.40	1784.32	121.50	1779.73	122.08	1781.29	112.33	1784.21
12/20/2016	123.90	1779.03	137.60	1765.36	120.33	1780.12	113.50	1783.52	117.40	1781.76	N.M.	N.M.	121.50	1779.73	122.80	1780.57	112.48	1784.06
1/23/2017	123.70	1779.23	137.80	1765.16	120.06	1780.39	113.41	1783.61	117.52	1781.64	N.M.	N.M.	121.40	1779.83	122.85	1780.52	112.98	1783.56
2/21/2017	123.78	1779.15	138.00	1764.96	120.10	1780.35	113.59	1783.43	117.68	1781.48	112.75	1783.97	121.42	1779.81	122.90	1780.47	112.96	1783.58
3/23/2017	123.85	1779.08	137.25	1765.71	120.13	1780.32	113.70	1783.32	117.79	1781.37	112.95	1783.77	121.60	1779.63	122.96	1780.41	113.12	1783.42
4/26/2017	124.08	1778.85	135.78	1767.18	120.30	1780.15	114.15	1782.87	118.10	1781.06	113.30	1783.42	121.72	1779.51	123.30	1780.07	113.52	1783.02
5/26/2017	124.53	1778.40	135.50	1767.46	121.08	1779.37	114.69	1782.33	118.41	1780.75	113.59	1783.13	122.27	1778.96	123.65	1779.72	113.80	1782.74
6/27/2017	N.M.	N.M.	139.13	1763.83	120.82	1779.63	114.32	1782.70	117.97	1781.19	113.20	1783.52	122.05	1779.18	123.45	1779.92	112.53	1784.01
8/8/2017	124.48	1778.45	141.19	1761.77	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.	N.M.
9/12/2017	124.53	1778.40	140.92	1762.04	121.18	1779.27	114.89	1782.13	117.10	1782.06	112.43	1784.29	122.32	1778.91	123.24	1780.13	110.75	1785.79
10/11/2017	124.68	1778.25	137.92	1765.04	121.34	1779.11	115.50	1781.52	117.72	1781.44	113.46	1783.26	122.53	1778.70	123.60	1779.77	112.83	1783.71
2/20/2018	125.50	1777.43	139.77	1763.19	121.85	1778.60	115.52	1781.50	117.80	1781.36	113.00	1783.72	123.25	1777.98	124.22	1779.15	111.40	1785.14
7/25/2018	126.29	1776.64	141.02	1761.94	122.95	1777.50	116.75	1780.27	119.42	1779.74	114.40	1782.32	124.14	1777.09	125.30	1778.07	113.52	1783.02
10/16/2018	125.78	1777.15	139.30	1763.66	121.71	1778.74	115.37	1781.65	118.70	1780.46	114.23	1782.49	123.32	1777.91	124.64	1778.73	113.77	1782.77
3/5/2019	122.40	1780.53	138.50	1764.46	120.85	1779.60	113.85	1783.17	117.28	1781.88	112.90	1783.82	122.00	1779.23	122.72	1780.65	112.33	1784.21
3/28/2019	124.16	1778.77	138.34	1764.62	120.46	1779.99	N.M.	N.M.	117.32	1781.84	112.35	1784.37	121.86	1779.37	122.80	1780.57	112.05	1784.49
4/30/2019	124.20	1778.73	137.13	1765.83	120.47	1779.98	N.M.	N.M.	117.85	1781.31	113.38	1783.34	121.90	1779.33	123.30	1780.07	113.33	1783.21
5/13/2019	124.56	1778.37	136.92	1766.04	120.98	1779.47	115.17	1781.85	118.37	1780.79	114.10	1782.62	122.35	1778.88	123.67	1779.70	114.03	1782.51
5/31/2019	125.10	1777.83	134.61	1768.35	121.77	1778.68	116.27	1780.75	118.88	1780.28	114.90	1781.82	122.98	1778.25	124.28	1779.09	114.84	1781.70
6/25/2019	125.59	1777.34	137.55	1765.41	121.55	1778.90	116.40	1780.62	119.00	1780.16	115.25	1781.47	121.20	1780.03	124.93	1778.44	115.25	1781.29
8/26/2019	125.47	1777.69	138.26	1765.17	121.39	1779.37	114.76	1782.79	119.36	1780.48	114.00	1782.88	123.00	1778.79	124.80	1779.13	114.10	1783.01
10/28/2019	124.62	1778.54	135.51	1767.92	120.95	1779.81	114.27	1783.28	117.70	1782.14	112.80	1784.08	122.22	1779.57	123.66	1780.27	111.20	1785.91
11/19/2019	124.32	1778.84	136.65	1766.78	121.08	1779.68	114.30	1783.25	116.87	1782.97	112.28	1784.60	122.10	1779.69	123.16	1780.77	110.10	1787.01
5/7/2020	124.23	1778.93	133.40	1770.03	121.44	1779.32	115.92	1781.63	117.00	1782.84	113.45	1783.43	122.37	1779.42	123.05	1780.88	112.85	1784.26
8/31/2020	124.50	1778.66	144.43	1759.00	121.17	1779.59	115.10	1782.45	116.63	1783.21	112.58	1784.30	122.40	1779.39	123.10	1780.83	109.80	1787.31
11/16/2020	125.24	1777.92	136.10	1767.33	122.20	1778.56	116.23	1781.32	117.60	1782.24	112.90	1783.98	123.20	1778.59	123.95	1779.98	110.95	1786.16
3/30/2021	124.08	1779.08	134.87	1768.56	121.25	1779.51	115.06	1782.49	116.70	1783.14	113.83	1783.05	122.20	1779.59	122.00	1781.93	112.82	1784.29
4/19/2021	123.80	1779.36	133.78	1769.65	120.88	1779.88	114.96	1782.59	116.80	1783.04	113.62	1783.26	121.92	1779.87	122.10	1781.83	113.00	1784.11
12/7/2021	124.35	1778.81	138.35	1765.08	120.60	1780.16	113.44	1784.11	118.22	1781.62	112.50	1784.38	121.90	1779.89	123.60	1780.33	112.96	1784.15
4/25/2022	124.20	1778.96	134.48	1768.95	120.47	1780.29	113.79	1783.76	118.25	1781.59	112.45	1784.43	121.78	1780.01	123.52	1780.41	113.12	1783.99
11/14/2022	124.95	1778.21	139.35	1764.08	121.55	1779.21	114.90	1782.65	118.05	1781.79	112.52	1784.36	122.62	1779.17	124.00	1779.93	111.70	1785.41
4/20/2023	125.05	1778.11	134.90	1768.53	121.50	1779.26	115.34	1782.21	118.12	1781.72	113.35	1783.53	122.92	1778.87	124.00	1779.93	113.18	1783.93
12/4/2023	126.55	1776.61	139.35	1764.08	123.15	1777.61	117.70	1779.85	119.70	1780.14	115.20	1781.68	124.47	1777.32	125.68	1778.25	115.10	1782.01

Notes:

TOC: Top of PVC well casing

N.M. = not measured

AMSL = above mean sea level

MW-15 was abandoned and replaced by MW-16S in 2022.

Table 3 - Groundwater Elevations

Groundwater Monitoring and Corrective Action Report
 Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
 January 2024

Investigative - Water Level Only Wells																				
Historical TOC July 2019 TOC	MW-10S		MW- 10M		MW-11S		MW-11M		MW-12S		MW-12M		MW-13S		MW-13M		MW-14		MW-15/16S	
	TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation	
	1904.83		1905.08		1899.63		1899.63		1910.30		1910.06		1905.01		1905.07		1897.41		1897.65	
	1904.84		1905.18		1899.69		1899.66		1910.39		1910.15		1904.89		1905.04		1897.46		1897.50	
Date	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measure d Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measure d Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation	Measured Depth to Water (ft)	GW Elevation
1/3/2019	134.05	1770.78	142.90	1762.18	135.60	1764.03	133.70	1765.93	138.80	1771.50	145.85	1764.21	128.30	1776.71	140.85	1764.22	125.20	1772.21	126.40	1771.25
1/23/2019	133.90	1770.93	144.23	1760.85	135.50	1764.13	134.22	1765.41	138.74	1771.56	145.95	1764.11	128.14	1776.87	140.50	1764.57	125.34	1772.07	126.65	1771.00
3/6/2019	133.70	1771.13	144.43	1760.65	135.25	1764.38	137.58	1762.05	N.M	N.M	145.82	1764.24	128.15	1776.86	140.87	1764.20	125.07	1772.34	127.03	1770.62
3/28/2019	133.83	1771.00	143.00	1762.08	135.26	1764.37	136.98	1762.65	138.65	1771.65	145.68	1764.38	128.25	1776.76	144.70	1760.37	125.30	1772.11	127.40	1770.25
4/30/2019	133.50	1771.33	140.68	1764.40	134.50	1765.13	136.20	1763.43	138.38	1771.92	144.97	1765.09	128.09	1776.92	139.68	1765.39	124.45	1772.96	126.48	1771.17
5/13/2019	133.60	1771.23	140.38	1764.70	134.55	1765.08	136.30	1763.33	138.40	1771.90	144.88	1765.18	128.40	1776.61	139.25	1765.82	124.45	1772.96	126.30	1771.35
5/31/2019	133.49	1771.34	137.87	1767.21	133.92	1765.71	134.15	1765.48	138.40	1771.90	143.07	1766.99	128.44	1776.57	136.35	1768.72	N.M.	N.M.	N.M.	N.M.
6/25/2019	133.46	1771.37	141.48	1763.60	134.15	1765.48	136.22	1763.41	138.37	1771.93	145.00	1765.06	128.72	1776.29	139.80	1765.27	125.54	1771.87	127.75	1769.90
8/26/2019	142.64	1762.20	142.64	1762.54	135.95	1763.74	137.28	1762.38	138.63	1771.76	145.97	1764.18	129.25	1775.64	140.68	1764.36	125.57	1771.89	127.95	1769.69
10/28/2019	133.60	1771.24	140.15	1765.03	134.34	1765.35	135.15	1764.51	138.37	1772.02	143.78	1766.37	128.69	1776.20	138.08	1766.96	123.65	1773.81	125.62	1772.02
11/19/2019	133.50	1771.34	141.45	1763.73	134.24	1765.45	135.75	1763.91	138.25	1772.14	144.42	1765.73	128.45	1776.44	139.05	1765.99	124.16	1773.30	126.57	1771.07
2/18/2020	133.15	1771.69	140.70	1764.48	133.86	1765.83	135.22	1764.44	138.10	1772.29	144.15	1766.00	127.72	1777.17	138.68	1766.36	123.17	1774.29	125.55	1772.09
5/7/2020	132.46	1772.38	140.10	1765.08	132.35	1767.34	133.72	1765.94	137.75	1772.64	141.95	1768.20	127.28	1777.61	135.30	1769.74	121.62	1775.84	123.82	1773.82
9/1/2020	133.68	1771.16	152.02	1753.16	140.45	1759.24	144.55	1755.11	138.27	1772.12	152.35	1757.80	127.98	1776.91	147.60	1757.44	128.80	1768.66	132.02	1765.62
11/17/2020	133.55	1771.29	143.10	1762.08	135.16	1764.53	136.62	1763.04	138.33	1772.06	145.20	1764.95	128.30	1776.59	139.40	1765.64	124.10	1773.36	126.95	1770.69
3/30/2021	133.30	1771.54	138.60	1766.58	133.70	1765.99	134.60	1765.06	138.20	1772.19	143.20	1766.95	127.75	1777.14	136.70	1768.34	122.60	1774.86	125.20	1772.44
4/19/2021	133.05	1771.79	137.42	1767.76	133.00	1766.69	133.49	1766.17	138.00	1772.39	142.60	1767.55	127.50	1777.39	135.75	1769.29	121.70	1775.76	124.35	1773.29
12/7/2021	133.40	1771.44	143.80	1761.38	135.30	1764.39	137.55	1762.11	138.10	1772.29	145.95	1764.20	128.15	1776.74	143.80	1761.24	124.20	1773.26	127.90	1769.74
4/18/2022	133.20	1771.64	137.55	1767.63	134.20	1765.49	134.55	1765.11	142.70	1767.69	142.45	1767.70	128.12	1776.77	135.90	1769.14	122.20	1775.26	124.75	1772.89
11/15/2022	133.90	1770.94	145.10	1760.08	136.96	1762.73	139.00	1760.66	N.M - DRY	N.M - DRY	147.12	1763.03	128.72	1776.17	141.43	1763.61	125.05	1772.41	114.62	1782.88
4/20/2023	133.40	1771.44	138.15	1767.03	133.90	1765.79	134.40	1765.26	N.M - DRY	N.M - DRY	143.12	1767.03	128.40	1776.49	136.64	1768.40	123.52	1773.94	N.M	N.M.
12/4/2023	134.25	1770.59	142.65	1762.53	137.53	1762.16	138.85	1760.81	139.15	1771.24	147.12	1763.03	129.42	1775.47	141.80	1763.24	125.20	1772.26	115.55	1781.95

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-1	11/17/2016	1.0	41	31	0.28	6.15	165	510
	2/21/2017	1.2	39	31	0.28	6.68	166	506
	3/22/2017	1.2	38	31	0.29	6.8	175	436
	4/26/2017	1.4	42	31	0.29	6.69	175	412
	5/26/2017	1.3	38	32	0.28	6.7	184	412
	7/6/2017	1.4	37	32	0.29	6.49	170	510
	8/8/2017	1.3	36	34	0.29	6.51	191	504
	9/12/2017	1.5	40	34	0.30	6.76	179	480
	10/12/2017	1.4	38	32	0.28	6.50	158	492
	3/7/2018	1.18	33.8	32.1	<.500	6.79	165	322
	7/25/2018	1.14	38.1	28.9	<.500	6.14	182	432
	10/16/2018	1.39	37.1	27.9	<.500	6.51	155	400
	3/5/2019	1.16	43	27.8	0.382	6.75	160	404
	5/13/2019	1.06	44.6	33.6	0.549	6.31	203	476
	8/26/2019	1.35	38.7	29.5	<.500	6.11	182	634
	11/19/2019	1.14	32.2	26.7	0.445	6.94	152	354
	2/17/2020	1.13	30.4	24.8	0.259	5.74	143	364
	5/6/2020	1.35	36.2	26.7	0.587	5.34	158	390
	8/31/2020	1.32	30.0	27.6	0.724	6.86	140	342
	11/16/2020	0.969	28.2	24.8	0.374J	6.83	139	294
	4/19/2021	1.06	27.3	24.2	0.316J	6.94	149	344
	12/7/2021	1.19	35.7	29.2	0.663	6.72	169	342
	4/25/2022	1.23	34.9	28.3	<1.00	6.77	175	370
	11/16/2022	<1.00	38.5	26.5	0.488J	6.96	166	354
	4/20/2023	1.05	35.8	31.2	0.465J	6.70	161	364
	12/5/2023	0.936	31.0	29.0	0.447J	6.85	150	322
MW-2B ^[2]	12/21/2016	0.43	80	31	0.31	7.24	174	566
	1/23/2017	0.52	84	30	0.26	7.08	192	518
	2/21/2017	0.50	82	30	0.29	6.84	169	572
	3/23/2017	0.47	77	30	0.30	6.84	176	502
	4/26/2017	0.52	86	30	0.30	6.85	168	536
	5/26/2017	0.46	83	30	0.29	6.81	184	494
	6/27/2017	0.55	90	30	0.31	6.94	169	584
	8/8/2017	0.48	69	30	0.31	6.68	176	730
	9/12/2017	0.57	83	30	0.31	6.66	177	548
	10/11/2017	0.51	82	30	0.28	6.73	159	644
	3/7/2018	0.547	83.4	28.7	<.500	6.79	167	458
	7/25/2018	0.632	77.1	27.9	<.500	6.28	164	460
	10/16/2018	0.538	86.4	26.6	<.500	6.53	149	456
	3/5/2019	0.606	96.3	27.8	0.401	6.63	158	488
	5/13/2019	0.489	79.1	30.8	0.552	6.32	168	480
	8/26/2019	0.548	82.0	28.2	<.500	6.06	163	486
	11/19/2019	0.572	78.3	26.6	0.274	6.69	151	444
	2/17/2020	0.548	79.5	27.5	<.500	5.47	157	458
	5/6/2020	0.600	86.8	27.1	0.534	5.15	149	472
	11/18/2020	0.562	79.2	26.1	<0.500	6.95	153	474
	4/20/2021	0.542	69.2	25.2	<0.500	6.93	144	410
	12/7/2021	0.537	71.7	28.4	0.667	6.83	150	394
	4/25/2022	0.573	79.2	28.2	<.500	6.85	150	402
	11/14/2022	0.614	83.4	23.6	<.500	7.03	127	390
	4/21/2023	0.530	81.1	28.4	<1.00	6.86	136	424
	12/5/2023	0.585	79.1	29.7	<1.00	6.94	146	422

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-3R	11/16/2016	0.77	65	33	0.29	6.38	207	574
	12/20/2016	0.61	65	35	0.29	6.76	221	548
	1/23/2017	0.47	73	39	0.25	6.79	283	642
	2/21/2017	0.49	77	39	0.29	6.65	238	626
	3/22/2017	0.46	73	37	0.30	6.70	233	590
	4/26/2017	0.50	69	36	0.30	6.68	227	588
	5/26/2017	0.41	59	36	0.28	6.58	264	652
	6/27/2017	0.45	67	36	0.29	6.68	214	634
	10/11/2017	0.42	64	34	0.28	6.55	198	724
	3/7/2018	0.471	67.1	36.2	<.500	6.62	218	484
	7/25/2018	0.594	48.5	29	<.500	6.51	174	430
	10/16/2018	0.601	60	30.9	<.500	6.53	186	454
	3/7/2019	0.702	74.1	32.6	0.299	6.55	233	532
	5/13/2019	0.616	71.1	37.0	0.519	6.46	232	540
	8/26/2019	0.667	75.4	35.1	<.500	5.88	213	550
	11/18/2019	0.704	63.3	31.7	0.481	6.58	191	484
	2/17/2020	0.811	81.2	33.4	<.500	5.69	240	566
	5/6/2020	0.971	90.8	34.8	0.401	5.53	278	622
	8/31/2020	0.951	79.3	22.8	0.374J	6.68	265	568
	11/16/2020	0.925	64.4	33.1	<0.500	6.58	237	522
	4/19/2021	0.847	60.3	34.2	<0.500	6.95	240	514
	12/7/2021	0.616	67.2	31.9	0.498J	6.62	201	418
	4/25/2022	0.685	64.9	29.9	<.500	6.67	221	470
	11/16/2022	<1.00	74	29.7	<.500	6.73	208	478
	4/21/2023	0.674	70.0	31.7	<1.00	6.62	201	460
	12/7/2023	0.687	62.1	31.8	<1.00	6.57	214	484
MW-4B	11/16/2016	0.48	47	31	0.28	6.58	162	424
	12/20/2016	0.51	43	31	0.25	6.52	170	432
	1/23/2017	0.62	46	31	0.20	6.58	180	620
	2/21/2017	0.59	41	31	0.24	6.38	166	480
	3/22/2017	0.72	40	30	0.24	6.49	162	470
	4/26/2017	0.69	35	30	0.26	6.40	155	456
	5/26/2017	0.66	40	30	0.25	6.44	167	456
	6/27/2017	0.64	41	29	0.26	6.49	147	492
	11/1/2017	0.52	51	29	0.22	6.37	170	490
	3/7/2018	0.518	41.5	29.4	<.500	6.4	169	286
	7/25/2018	0.58	41.4	28.1	<.500	6.52	176	386
	10/16/2018	0.532	48.8	28.36	<.500	6.55	192	424
	3/7/2019	0.929	51.4	27.6	0.367	6.65	167	406
	5/15/2019	0.809	40.9	30.1	0.579	6.54	166	376
	8/27/2019	0.66	42.7	28.2	<.500	6.15	186	444
	11/18/2019	0.693	52.1	25.8	<.500	6.59	160	424
	2/17/2020	0.947	49.9	27.6	<.500	5.77	179	430
	5/6/2020	0.990	45.3	26.7	0.665	5.24	156	396
	8/31/2020	0.709	39.9	25.8	0.677	6.78	143	386
	11/16/2020	1.05	37.6	24.7	0.609	6.79	155	368
	4/19/2021	0.706	27.1	24.1	0.892	6.78	138	312
	12/7/2021	0.687	54.7	26.2	0.732	6.54	227	384
	4/25/2022	0.796	76.1	28.3	<.500	6.27	343	606
	11/14/2022	0.896	47.6	23.1	<.500	6.69	142	340
	4/20/2023	0.764	51.3	27.8	<1.00	6.55	192	388
	12/5/2023	0.657	48.4	28.2	<1.00	6.67	177	352

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-5B	11/16/2016	1.2	39	30	1.1	6.35	157	428
	12/20/2016	1.2	37	30	1.2	7.11	33.5	492
	1/23/2017	1.3	33	30	1.2	7.26	174	412
	2/21/2017	1.3	36	30	1.3	6.91	159	480
	3/22/2017	1.2	35	30	1.3	7.03	167	482
	4/26/2017	1.3	35	30	1.3	7.07	164	438
	5/26/2017	1.1	35	30	1.3	6.44	173	460
	6/27/2017	1.1	43	29	1.2	6.95	164	492
	10/11/2017	1.1	72	30	0.86	6.58	132	662
	3/7/2018	1.15	63.1	29.5	1.34	6.65	182	512
	7/25/2018	1.89	55.3	26.7	0.896	6.55	172	436
	10/16/2018	1.23	78.3	26.1	0.714	6.56	178	542
	3/5/2019	0.333	24.4	29.3	0.672	6.84	164	382
	5/13/2019	0.759	39.3	29.1	1.50	6.49	167	412
	8/28/2019	0.674	38.2	26.8	1.4	6.94	151	448
	11/18/2019	0.783	49	25.5	0.984	6.18	174	458
	2/17/2020	1.91	52.7	24.7	0.597	5.30	209	456
	5/6/2020	1.54	48.2	20.0	1.41	5.86	172	440
	8/31/2020	1.17	39.6	22.0	1.26	7.25	136	340
	11/16/2020	1.33	34.6	23.4	1.10	7.30	135	372
	4/19/2021	1.03	32.7	21.1	1.11	7.17	139	346
	12/7/2021	1.07	47.5	25.2	1.52	7.16	184	326
	4/25/2022	1.12	43.5	26.5	0.825J	7.07	182	358
	11/14/2022	1.54	42.0	18.4	0.451J	7.19	89.5	286
	4/20/2023	1.62	37.3	24.7	1.16	7.19	114	322
	12/4/2023	1.22	25.5	24.4	1.28	7.29	78.7	254
MW-6	11/16/2016	0.55	60	31	0.36	6.24	157	470
	12/20/2016	0.6	59	32	0.35	6.88	172	452
	1/23/2017	0.75	64	33	0.3	7.04	175	472
	2/21/2017	0.72	58	32	0.34	6.86	158	478
	3/22/2017	0.61	57	32	0.34	6.91	169	566
	4/26/2017	0.6	65	32	0.35	6.84	163	618
	5/26/2017	0.5	58	31	0.35	6.87	180	444
	6/27/2017	0.47	67	31	0.36	6.91	148	500
	10/11/2017	0.55	79	32	0.30	6.71	169	602
	3/7/2018	1.12	61.3	32.8	<.500	7.02	167	442
	7/25/2018	0.738	61.7	31.1	<.500	6.74	180	474
	10/16/2018	0.501	68.8	30.9	<.500	6.81	152	466
	3/5/2019	0.333	24.4	29.3	0.672	6.84	164	452
	5/13/2019	0.459	73.1	36.1	0.622	6.54	182	496
	8/26/2019	0.562	73.9	30.5	0.33	6.22	166	500
	11/18/2019	0.629	68.9	29.5	0.547	6.39	157	420
	2/17/2020	0.901	53.0	25.8	<.500	6.14	149	388
	5/6/2020	1.10	55.7	27.5	0.635	6.14	146	404
	8/31/2020	0.618	45.7	25.6	0.639	6.94	174	376
	11/16/2020	0.761	51.2	26.5	0.416J	6.82	148	416
	4/19/2021	0.855	46.3	27.4	0.433J	6.86	145	370
	12/7/2021	1.05	52.9	28.0	0.779	6.74	164	312
	4/18/2022	0.634	54.3	27.2	<1.00	6.61	134	348
	11/14/2022	0.577	59.0	23.0	<0.500	6.99	123	330
	4/20/2023	0.711	54.0	27.2	0.403J	6.84	137	352
	12/4/2023	0.705	55.0	30.3	0.400J	7.15	151	366

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Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-7	11/16/2016	1.0	43	30	0.38	6.51	182	494
	12/20/2016	1.1	56	32	0.36	6.90	239	536
	1/23/2017	1.3	82	33	0.27	6.77	349	688
	2/21/2017	1.2	71	33	0.33	6.62	277	636
	3/22/2017	1.1	62	32	0.36	6.64	273	656
	4/26/2017	1.1	58	32	0.38	6.59	232	552
	5/26/2017	0.95	59	33	0.37	6.56	267	526
	6/27/2017	0.99	79	35	0.34	6.60	299	696
	10/11/2017	0.97	60	34	0.34	6.42	215	664
	3/7/2018	1.13	43	67.4	0.604	6.61	369	384
	7/25/2018	1.4	39.3	30.6	<.500	6.44	181	438
	10/16/2018	0.957	39	28.3	<.500	6.51	161	426
	3/5/2019	0.914	41	29.8	<.500	6.8	179	420
	5/13/2019	1.56	41.6	33.3	0.852	6.34	195	454
	8/26/2019	1.09	42.1	29.8	0.254	5.85	185	440
	11/18/2019	1.16	52.9	38.7	<.500	6.62	216	496
	2/17/2020	1.35	54.9	32.7	0.289	5.59	256	528
	5/6/2020	1.47	39.5	27.2	0.517	5.17	145	450
	8/31/2020	1.02	31.0	26.9	0.758	6.84	141	344
	11/16/2020	0.825	31.0	26.4	0.658	6.75	149	362
	4/20/2021	1.08	28.1	24.5	0.448J	6.83	145	320
	12/7/2021	1.31	79.7	47.5	0.67	6.52	348	608
	4/25/2022	1.33	109	38.7	0.371J	6.44	457	814
MW-8	11/14/2022	0.619	47.6	24.4	<.500	6.77	157	356
	4/20/2023	0.942	44.7	28.9	0.630J	6.64	153	364
	12/5/2023	0.813	48.1	30.3	0.649J	6.79	172	364
	11/16/2016	1.1	40	31	0.63	6.5	157	496
	12/20/2016	1.1	40	32	0.63	7.70	185	416
	1/23/2017	1.3	41	32	0.58	7.50	175	402
	2/21/2017	1.3	45	33	0.64	7.26	180	434
	3/22/2017	1.2	41	33	0.69	7.19	181	472
	4/26/2017	1.3	45	33	0.76	7.23	189	442
	5/26/2017	1.2	60	35	0.75	7.14	272	566
	6/27/2017	1.3	68	35	0.77	7.21	247	594
	10/11/2017	1	65	33	0.81	7.05	216	600
	3/7/2018	1.69	52.8	30.1	1.12	6.96	168	416
	7/26/2018	1.89	38.6	26.47	0.969	6.53	158	398
	10/16/2018	1.5	41.3	27.1	0.724	6.53	160	400
	3/5/2019	1.49	46.6	27.1	1.11	6.77	188	450
	5/13/2019	1.13	35.7	31.0	1.36	6.53	174	418
	8/26/2019	0.975	32	27.3	0.888	6.37	156	418
	11/18/2019	1.04	58.5	32.2	1.08	6.87	265	506
	2/17/2020	1.05	32.4	26.0	0.782	5.80	156	374
	5/7/2020	1.22	32.3	26.3	1.36	6.57	140	348
	8/31/2020	0.785	29.3	23.3	1.22	7.32	120	342
	11/16/2020	0.879	32.1	25.1	0.886	7.25	154	380
	4/19/2021	1.21	32.6	24.5	1.01	7.33	172	368
	12/7/2021	1.24	32.8	34.8	3.17	7.26	156	316
	4/25/2022	1.79	26.9	23.3	0.947	7.21	136	312
	11/14/2022	1.27	26	20.5	0.281J	7.37	109	280
	4/20/2023	1.19	35.2	26.2	0.949J	7.12	140	326
	12/5/2023	0.916	42.1	29.5	0.782J	7.20	165	344

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

	Constituent Reporting Unit	Appendix III Constituents						
		Boron	Calcium	Chloride	Fluoride*	pH ^[1]	Sulfate	TDS
		mg/L	mg/L	mg/L	mg/L	S.U.	mg/L	mg/L
MW-9	11/16/2016	0.83	39	28	1.0	6.67	154	376
	12/20/2016	0.74	42	29	0.97	6.89	177	414
	1/23/2017	0.87	48	29	0.87	7.19	166	412
	2/21/2017	0.73	43	30	0.91	7.02	154	444
	3/22/2017	0.83	45	30	0.91	7.08	171	480
	4/26/2017	1.0	43	30	0.9	7.04	163	400
	5/26/2017	0.98	44	30	0.87	6.93	175	396
	6/27/2017	0.89	46	30	0.85	7.03	155	496
	10/11/2017	1.7	45	29	0.59	6.85	139	496
	3/7/2018	0.365	42.6	36.4	0.639	6.95	215	418
	7/25/2018	0.816	35.4	26.5	0.472	6.47	152	344
	10/16/2018	1.19	33.1	26.9	0.618	6.59	126	330
	3/5/2019	1.07	37.7	26.7	1.33	6.94	138	352
	5/13/2019	0.862	32.9	29.4	1.56	6.58	144	378
	8/26/2019	0.957	30.4	25.5	0.956	6.21	133	364
	11/18/2019	1.55	33.4	23.6	1.08	6.16	119	276
	2/17/2020	0.968	33.9	25.9	0.798	6.01	132	338
	5/6/2020	0.750	33.4	25.4	0.992	5.35	126	328
	8/31/2020	1.54	36.0	24.7	0.813	7.13	125	312
	11/16/2020	1.37	27.2	23.5	1.14	7.14	121	332
	4/19/2021	0.748	28.0	23.7	0.717	7.19	124	280
	12/7/2021	1.36	40.5	26.0	1.02	7.09	138	294
	4/25/2022	0.622	38.2	28.5	<1.00	6.96	133	312
	11/14/2022	1.21	34.6	22.9	<0.500	7.17	125	270
	4/20/2023	0.468	35.7	26.9	0.753J	7.00	138	306
	12/4/2023	1.40	25.8	27.0	1.39	7.19	99.1	230

Notes:

^[1] During the spring 2020 semiannual sampling event, the pH meter did not calibrate within range, and therefore the pH values reported for the February 17th, 2020 and May 6th - 7th, 2020 sampling events were likely inaccurate. The values were marked as outliers for the fall 2020 sampling event and will not be used in future analysis. The meter was repaired after the spring 2020 sampling event.

^[2] During the August/September 2020 sampling event, the pump stopped working and therefore a sample was not collected.

* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

< For the period of November 2016 through October 2019, the symbol indicates analyte not detected above the reporting limit, which is the value shown following the "<" symbol. Starting in January 2020, the symbol indicates analyte not detected above the method detection limit, which is the value shown following the "<" symbol.

"J" data qualifier indicates the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

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Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-1	11/17/2016 ^[1]	< 0.001	0.00341	0.0868	< 0.001	< 0.0005	0.0344	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0395	1.19	0.0367	< 0.001
	2/21/2017	< 0.001	0.00349	0.0826	< 0.001	< 0.0005	0.0344	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0387	1.22	0.0445	< 0.001
	3/22/2017	< 0.001	0.00314	0.0789	< 0.001	< 0.0005	0.0315	< 0.0005	0.29	< 0.0005	0.0146	< 0.0002	0.038	2.49	0.0411	< 0.001
	4/26/2017	< 0.001	0.00361	0.0812	< 0.001	< 0.0005	0.0336	< 0.0005	0.29	< 0.0005	0.0122	< 0.0002	0.0362	2.15	0.038	< 0.001
	5/26/2017	< 0.001	0.00338	0.0739	< 0.001	< 0.0005	0.0329	< 0.0005	0.28	< 0.0005	0.0154	< 0.0002	0.034	0.604	0.0377	< 0.001
	7/6/2017	< 0.001	0.00311	0.0788	< 0.001	< 0.0005	0.029	< 0.0005	0.29	< 0.0005	0.0126	< 0.0002	0.0337	1.16	0.042	< 0.001
	8/8/2017	< 0.001	0.00289	0.0806	< 0.001	< 0.0005	0.0259	< 0.0005	0.29	< 0.0005	0.0117	< 0.0002	0.031	1.02	0.0395	< 0.001
	9/12/2017	< 0.001	0.00288	0.0713	< 0.001	< 0.0005	0.0248	< 0.0005	0.30	0.0077	0.0117	< 0.0002	0.0353	1.41	0.0437	< 0.001
	10/12/2017	< 0.001	0.00362	0.0754	< 0.001	< 0.0005	0.025	< 0.0005	0.28	< 0.0005	0.0119	< 0.0002	0.0369	2.12	0.0369	< 0.001
	3/7/2018	0.000207J	0.00398	0.0699	<0.00100	< 0.000500	0.0306	0.000101J	<0.500	< 0.000500	0.0111	< 0.000200	0.035	0.842	0.0439	< 0.00100
	7/25/2018	< 0.00100	0.00399	0.0821	<0.00100	< 0.000500	0.033	0.00018J	<0.500	< 0.000500	0.0109	< 0.000200	0.0284	0.842	0.13	< 0.00100
	10/16/2018	< 0.00100	0.00444	0.0754	<0.00100	< 0.000500	0.033	0.000129J	<0.500	< 0.000500	0.0116	< 0.000200	0.0299	0.477	0.0894	< 0.00100
	3/5/2019	< 0.00100	0.00522	0.0973	<0.00100	< 0.000500	0.0413	0.000149J	0.382J	< 0.000500	0.0142	< 0.000200	0.0402	0.949	0.102	< 0.00100
	5/13/2019	<0.00300	0.00413	0.102	<0.00100	< 0.000500	0.0365	<0.00100	0.549	< 0.000500	0.0123	< 0.000200	0.0337	0.838	0.0943	<0.00200
	8/26/2019	< 0.00100	0.00409	0.0843	<0.00100	<0.000100	0.0311	0.000105J	<0.500	< 0.000500	0.0125	< 0.000200	0.0422	Not Sampled	0.0587	< 0.00100
	11/19/2019	< 0.00100	0.00447	0.0673	<0.00100	<0.000100	0.0315	0.000102J	0.445J	< 0.000500	0.00881J	< 0.000200	0.0386	1.53	0.0394	< 0.00100
	2/17/2020	<0.00100	0.00473	0.0640	<0.00100	<0.000100	0.0303	0.000129J	0.259J	<0.000500	0.0111	< 0.000200	0.0420	1.32	0.0448	<0.00100
	5/6/2020	<0.00100	0.00459	0.0770	<0.00100	<0.000100	0.0327	0.000119J	0.587	<0.000500	0.0107	<0.000200	0.0441	Not Sampled ^[3]	0.0668	<0.00100
	8/31/2020	<0.00100	0.00414	0.0655	<0.00100	<0.000100	0.0296	0.0000990J	0.724	<0.000500	0.0104	<0.000200	0.0436	Not Sampled	0.0404	<0.00100
	11/16/2020	<0.00100	0.00409	0.0627	<0.00100	<0.000100	0.0329	<0.000500	0.374J	<0.000500	0.0101	<0.000200	0.0395	0.269U	0.0297	<0.00100
	4/19/2021	<0.00200	0.00367	0.0726	<0.00100	<0.000100	0.0323	0.0000930J	0.316J	<0.000500	0.00997J	<0.000200	0.0281	0.647	0.0385	<0.00100
	12/7/2021	<0.00200	0.00298	0.0797	<0.00100	<0.000100	0.0324	<0.000500	0.663	<0.000500	0.00981J	<0.000200	0.0432	1.1	0.072	<0.00100
	4/25/2022	<0.00200	0.00371	0.0832	<0.00100	<0.000100	0.0207	<0.000500	<1.00	<0.000500	0.0107	<0.000200	0.037	Not Sampled ^[4]	0.0636	<0.00100
	11/16/2022	<0.00200	0.00452	0.0886	<0.00100	<0.000100	0.0262	<0.000500	0.488J	<0.000500	0.00907J	<0.000200	0.0280	1.06	0.0454	<0.00100
	4/20/2023	<0.00200	0.00430	0.0833	<0.00100	<0.000200	0.0380	0.000206J	0.465J	<0.000500	0.0140	<0.000200	0.0350	0.830	0.0602	<0.00100
	12/5/2023	<0.00200	0.00449	0.0718	<0.00100	<0.000200	0.0331	<0.000500	0.447J	<0.000500	0.0102	<0.000200	0.0222	2.10	0.0413	<0.00100
MW-2B ^[2,4]	12/21/2016	< 0.001	0.00213	0.162	< 0.001	< 0.0005	0.0178	< 0.0005	0.31	< 0.0005	< 0.05	< 0.0002	0.0043	3.74 U	0.0325	< 0.001
	1/23/2017	< 0.001	0.00204	0.159	< 0.001	< 0.0005	0.0144	< 0.0005	0.26	< 0.0005	< 0.05	< 0.0002	0.00329	1.56	0.0316	< 0.001
	2/21/2017	< 0.001	0.00224	0.172	< 0.001	< 0.0005	0.0154	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00302	1.25	0.036	< 0.001
	3/23/2017	< 0.001	< 0.002	0.161	< 0.001	< 0.0005	0.0154	< 0.0005	0.30	< 0.0005	0.0142	< 0.0002	0.00325	2.26 U	0.0335	< 0.001
	4/26/2017	< 0.001	0.00235	0.183	< 0.001	< 0.0005	0.018	< 0.0005	0.30	< 0.0005	0.014	< 0.0002	0.00312	0.848	0.0351	< 0.001
	5/26/2017	< 0.001	< 0.002	0.165	< 0.001	< 0.0005	0.015	< 0.0005	0.29	< 0.0005	0.0151	< 0.0002	0.00249	1.12	0.0308	< 0.001
	6/27/2017	< 0.001	< 0.002	0.167	< 0.001	< 0.0005	0.0173	< 0.0005	0.31	< 0.0005	0.0143	< 0.0002	0.00277	1.71	0.0347	< 0.001
	8/8/2017	< 0.001	< 0.002	0.159	< 0.001	< 0.0005	0.0175	< 0.0005	0.31	< 0.0005	0.0143	< 0.0002	0.00254	1.32	0.0358	< 0.001
	9/12/2017	< 0.001	< 0.002	0.142	< 0.001	< 0.0005	0.153	< 0.0005	0.31	< 0.0005	< 0.01	< 0.0002	0.00258	1.67	0.0373	< 0.001
	10/11/2017	< 0.001	0.00211	0.174	< 0.001	< 0.0005	0.0154	< 0.0005	0.28	< 0.0005	0.0142	< 0.0002	0.00248	2.06	0.0324	< 0.001
	3/7/2018	0.000202J	0.00224	0.176	<0.00100	< 0.000500	0.0175	0.000075J	<0.500	< 0.000500	0.0141	< 0.000200	0.0026	1.38	0.0358	< 0.00100
	7/25/2019	< 0.00100	0.00216	0.169	<0.00100	< 0.000500	0.018	0.000067J	<0.500	< 0.000500	0.0127	< 0.000200	0.00287	1.26	0.0366	< 0.00100
	10/16/2018	< 0.00100	0.00245	0.19	<0.00100	< 0.000500	0.0174	0.000374J	<0.500	0.000934	0.0156	< 0.000200	0.00245	1.24	0.0324	< 0.00100
	3/5/2019	< 0.00100	0.00265	0.22	<0.00100	< 0.000500	0.0205	< 0.000500	0.401J	< 0.000500	0.0173	< 0.000200	0.00313	1.59	0.0419	< 0.00100
	5/13/2019	<0.00300	0.00235	0.181	<0.00100	< 0.000500	0.0163	<0.00100	0.552	< 0.000500	0.013	< 0.000200	0.00264J	0.994	0.0382	<0.00200
	8/26/2019	< 0.00100	0.0023	0.174	<0.00100	< 0.000100	0.0165	< 0.000500	<0.500	< 0.000500	0.0146	< 0.000200	0.00251	Not Sampled	0.0362	< 0.00100
	11/19/2019	< 0.00100	0.00211	0.167	<0.00100	< 0.000100	0.0157	< 0.000500	0.274J	< 0.000500	0.0128	< 0.000200	0.00248	1.23	0.0339	< 0.00100
	2/17/2020	<0.00100	0.00217	0.184	<0.00100	<0.000100	0.0170	0.000100J	<0.500	<0.000500	0.0161	<0.000200	0.00249	2.12	0.0369	<0.00100
	5/6/2020	<0.00100	0.00237	0.193	<0.00100	<0.000100	0.0183	0.000347J	0.534	<0.000500	0.0145	<0.000200	0.00356	Not Sampled ^[3]	0.0363	<0.00100

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-2B ^[2,4]	11/18/2020	<0.00100	0.00203	0.178	<0.00100	<0.0001000	0.0172	<0.000500	<0.500	<0.000500	0.0144	<0.000200	0.00267	0.982	0.0372	<0.00100
	4/20/2021	<0.00200	0.00204	0.193	<0.00100	<0.000100	0.0171	<0.000500	<0.500	<0.000500	0.0138	<0.000200	0.00265	0.768	0.0339	<0.00100
	12/7/2021	<0.00200	0.00174J	0.162	<0.00100	<0.000100	0.0178	<0.000500	0.667	<0.000500	0.0132	<0.000200	0.003	1.7	0.0359	<0.00100
	4/25/2022	<0.00200	0.00197J	0.182	<0.00100	<0.000100	0.0182	<0.000500	<0.500	<0.000500	0.0156	<0.000200	0.00216	1.1	0.0392	<0.00100
	11/14/2022	<0.00200	0.00208	0.192	<0.00100	<0.000100	0.0169	<0.000500	<0.500	<0.000500	0.0153	<0.000200	0.00210	Not Sampled	0.0388	<0.00100
	4/20/2023	<0.00200	0.00205	0.182	<0.00100	<0.000200	0.0179	<0.000500	<1.00	<0.000500	0.0162	<0.000200	0.00240	0.466	0.0369	<0.00100
	12/5/2023	<0.00200	0.00225	0.176	<0.00100	<0.000200	0.0178	<0.000500	<1.00	<0.000500	0.0156	<0.000200	0.00242	2.96	0.0372	<0.00100
MW-3R	11/16/2016 ^[1]	< 0.001	0.00246	0.0857	< 0.001	< 0.0005	0.00941	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00414	0.791	0.0421	< 0.001
	12/20/2016	< 0.001	0.00285	0.0927	< 0.001	< 0.0005	0.00785	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.00412	1.35	0.0367	< 0.001
	1/23/2017	< 0.001	0.0024	0.102	< 0.001	< 0.0005	0.00553	< 0.0005	0.25	< 0.0005	< 0.05	< 0.0002	0.00294	1.35	0.0348	< 0.001
	2/21/2017	< 0.001	0.00261	0.0993	< 0.001	< 0.0005	0.00526	< 0.0005	0.29	< 0.0005	< 0.05	< 0.0002	0.0031	1.31 U	0.0339	< 0.001
	3/22/2017	< 0.001	0.00226	0.0906	< 0.001	< 0.0005	< 0.005	< 0.0005	0.3	< 0.0005	0.0274	< 0.0002	0.00335	1.42	0.0319	< 0.001
	4/26/2017	< 0.001	0.00276	0.087	< 0.001	< 0.0005	< 0.005	< 0.0005	0.3	< 0.0005	0.0258	< 0.0002	0.00365	0.44	0.032	< 0.001
	5/26/2017	< 0.001	0.00238	0.0757	< 0.001	< 0.0005	< 0.005	< 0.0005	0.28	< 0.0005	0.0292	< 0.0002	0.00302	1.21	0.0299	< 0.001
	6/27/2017	< 0.001	0.00224	0.0814	< 0.001	< 0.0005	0.00578	< 0.0005	0.29	< 0.0005	0.03	< 0.0002	0.00361	1.28	0.0339	< 0.001
	10/11/2017	< 0.001	0.0026	0.756	< 0.001	< 0.0005	0.00876	< 0.0005	0.28	< 0.0005	< 0.01	< 0.0002	0.00271	2.15	0.0333	< 0.001
	3/7/2018	0.000192J	0.00231	0.0672	<0.00100	<0.000500	0.00877	0.000064J	<0.500	< 0.000500	0.0262	< 0.000200	0.00251	0.843	0.0384	< 0.00100
	7/25/2018	< 0.00100	0.00205	0.0611	<0.00100	<0.000500	0.00675	<0.000500	<0.500	< 0.000500	0.0258	< 0.000200	0.00322	0.637	0.0255	< 0.00100
	10/16/2018	< 0.00100	0.00225	0.0709	<0.00100	<0.000500	0.00463J	<0.000500	<0.500	< 0.000500	0.0299	< 0.000200	0.00327	0.519	0.0277	< 0.00100
	3/7/2019	< 0.00100	0.00204	0.0784	<0.00100	<0.000500	0.0126	0.000279	0.299J	< 0.000500	0.0302	< 0.000200	0.00476	1.55	0.0607	< 0.00100
	5/13/2019	<0.00300	0.00231	0.0802	<0.00100	<0.000500	0.0125	<0.00100	0.519	< 0.000500	0.0274	< 0.000200	0.00566	0.921	0.0590	<0.00200
	8/26/2019	< 0.00100	0.00246	0.079	<0.00100	< 0.000100	0.00392J	< 0.000500	<0.500	< 0.000500	0.0302	< 0.000200	0.00613	Not Sampled	0.035	< 0.00100
	11/18/2019	< 0.00100	0.00259	0.0651	<0.00100	< 0.000100	0.00385J	< 0.000500	0.481J	< 0.000500	0.0266	< 0.000200	0.00553	1.04	0.038	< 0.00100
	2/17/2020	<0.00100	0.00220	0.0874	<0.00100	<0.000100	0.00355J	0.000108J	<0.500	<0.000500	0.0327	<0.000200	0.00401	1.49	0.0595	<0.00100
	5/6/2020	<0.00100	0.00239	0.0905	<0.00100	<0.000100	0.01	0.000188J	0.401J	<0.000500	0.0306	<0.000200	0.00593	Not Sampled ^[3]	0.0606	<0.00100
	8/31/2020	<0.00100	0.00217	0.0755	<0.00100	<0.000100	0.0125	0.0003J	0.374J	<0.0005000	0.0322	<0.000200	0.00673	Not Sampled	0.0398	<0.001000
	11/16/2020	<0.00100	0.00198J	0.0611	<0.00100	<0.0001	0.0237	0.000668	<0.500	<0.000500	0.0314	<0.000200	0.0107	0.427U	0.0351	<0.00100
	4/19/2021	<0.00200	0.00234	0.0585	<0.00100	<0.000100	0.0233	0.000806	<0.500	<0.000500	0.0271	<0.000200	0.0122	0.184U	0.0382	<0.00100
	12/7/2021	<0.00200	0.00190J	0.0648	<0.00100	<0.000100	0.0353	0.000873	0.498J	<0.000500	0.0248	<0.000200	0.0114	1.27	0.0495	<0.00100
	4/25/2022	<0.00200	0.00237	0.0598	<0.00100	<0.000100	0.0341	0.00221	<0.500	<0.000500	0.0229	<0.000200	0.0194	0.727	0.0473	<0.00100
	11/16/2022	<0.00200	0.00293	0.0705	<0.00100	<0.000100	0.00515	< 0.000500	<0.500	<0.000500	0.0293	<0.000200	0.00687	Not Sampled	0.0548	<0.00100
	4/21/2023	<0.00200	0.00244	0.0639	<0.00100	<0.000200	0.00480J	<0.000500	<1.00	<0.000500	0.0302	<0.000200	0.00527	0.595U	0.0408	<0.00100
	12/7/2023	<0.00200	0.00252	0.0642	<0.00100	<0.000200	0.00334J	<0.000500	<1.00	<0.000500	0.0361	<0.000200	0.00820	2.09	0.0216	<0.00100
MW-4B	11/16/2016 ^[1]	< 0.001	0.00281	0.0364	< 0.001	< 0.0005	0.00648	< 0.0005	0.28	< 0.0005	< 0.05	< 0.0002	0.0123	0.424 U	0.0288	< 0.001
	12/20/2016	< 0.001	0.00297	0.0327	< 0.001	< 0.0005	< 0.005	< 0.0005	0.25	< 0.0005	< 0.05	< 0.0002	0.00402	1.08	0.0253	< 0.001
	1/23/2017	< 0.001	0.00286	0.033	< 0.001	< 0.0005	< 0.005	< 0.0005	0.20	< 0.0005	< 0.05	< 0.0002	0.00314	0.737	0.0281	< 0.001
	2/21/2017	< 0.001	0.00316	0.0337	< 0.001	< 0.0005	< 0.005	< 0.0005	0.24	< 0.0005	< 0.05	< 0.0002	0.00287	0.555 U	0.0263	< 0.001
	3/22/2017	< 0.001	0.00274	0.0296	< 0.001	< 0.0005	< 0.005	< 0.0005	0.24	< 0.0005	0.0321	< 0.0002	0.00266	0.775	0.0256	< 0.001
	4/26/2017	< 0.001	0.00376	0.0323	< 0.001	< 0.0005	0.00508	< 0.0005	0.26	< 0.0005	0.0313	< 0.0002	0.00324	0.917	0.0308	< 0.001
	5/26/2017	< 0.001	0.00315	0.0291	< 0.001	< 0.0005	0.00758	< 0.0005	0.25	< 0.0005	0.0373	< 0.0002	0.00327	0.625 U	0.029	< 0.001
	6/27/2017	< 0.001	0.0032	0.0319	< 0.001	< 0.0005	0.0105	< 0.0005	0.26	< 0.0005	0.0296	< 0.0002	0.00411	0.0747 U	0.0291	< 0.001
	11/1/2017	0.0011	< 0.002	0.0356	< 0.001	< 0.0005	0.0123	< 0.0005	0.22	< 0.0005	0.0325	< 0.0002	0.00515	2.33	0.0323	< 0.001
	3/7/2018	< 0.00100	0.00228	0.032	<0.00100	< 0.000500	0.00444J	< 0.000500	<0.500	< 0.000500	0.0271	< 0.000200	0.00557	0.468	0.0177	< 0.00100
	7/25/2018	< 0.00100	0.00202	0.0319	<0.00100	< 0.000500	0.00328J	< 0.000500	<0.500	< 0.000500	0.026	< 0.000200	0.00458	0.614	0.016	< 0.00100
	10/16/2018	< 0.00100	0.00245	0.0353	<0.00100	< 0.000500	0.00185	< 0.000500	<0.500	0.000606	0.031	< 0.000200	0.00604	0.26 U	0.0103	< 0.00100

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-4B	3/7/2019	< 0.00100	0.00319	0.0443	<0.00100	< 0.000500	0.0131	< 0.000500	0.367J	< 0.000500	0.0311	< 0.000200	0.0139	0.899	0.0529	< 0.00100
	5/13/2019	<0.00300	0.00278	0.0337	<0.00100	< 0.000500	0.0639	0.00287	0.579	0.000195J	0.0245	< 0.000200	0.0259	1.19	0.0232	<0.00200
	8/27/2019	< 0.00100	0.00261	0.0347	<0.00100	< 0.000100	< 0.00500	< 0.000500	<0.500	< 0.000500	0.0265	< 0.000200	0.00578	Not Sampled	0.0156	< 0.00100
	11/18/2019	< 0.00100	0.00447	0.0403	<0.00100	< 0.000100	0.00933	< 0.000500	<0.500	< 0.000500	0.0334	< 0.000200	0.00683	0.975	0.0656	< 0.00100
	2/17/2020	<0.00100	0.00250	0.0392	<0.00100	<0.000100	0.0148	<0.000500	<0.500	<0.000500	0.0314	<0.000200	0.0145	1.85	0.0538	<0.00100
	5/6/2020	<0.00100	0.00286	0.0349	<0.00100	<0.000100	0.0216	<0.000500	0.665	<0.000500	0.0228	<0.000200	0.0188	Not Sampled ^[3]	0.0416	<0.00100
	8/31/2020	<0.00100	0.00270	0.0327	<0.00100	<0.000100	0.024	<0.000500	0.677	<0.000500	0.0213	<0.000200	0.0151	Not Sampled	0.036	<0.00100
	11/16/2020	<0.00100	0.00238	0.031	<0.00100	<0.000100	0.0246	<0.000500	0.609	<0.000500	0.0174	<0.000200	0.0185	0.707	0.0372	<0.00100
	4/19/2021	<0.00200	0.00345	0.0276	<0.00100	<0.000100	0.0267	<0.000500	0.892	<0.000500	0.0150	<0.000200	0.0172	0.375	0.0250	<0.00100
	12/7/2021	<0.00200	0.00227	0.0623	<0.00100	0.0000520J	<0.00500	<0.000500	0.732	<0.000500	0.0214	<0.000200	0.0108	1.26	0.0445	<0.00100
	4/25/2022	<0.00200	0.00222	0.0675	<0.00100	<0.000100	0.00271J	<0.000500	<0.500	<0.000500	0.0467	<0.000200	0.00446	1.1	0.032	<0.00100
	11/14/2022	<0.00200	0.00288	0.0398	<0.00100	<0.000100	0.0118	<0.000500	<0.500	<0.000500	0.0268	<0.000200	0.00863	Not Sampled	0.0425	<0.00100
	4/20/2023	<0.00200	0.00258	0.0441	<0.00100	<0.000200	0.00731	0.000236J	<1.00	<0.000500	0.0322	<0.000200	0.0104	0.696	0.0273	<0.00100
	12/5/2023	<0.00200	0.00258	0.0444	<0.00100	<0.000200	0.0122	<0.000500	<1.00	<0.000500	0.0264	<0.000200	0.0110	2.01	0.0638	<0.00100
MW-5B	11/16/2016 ^[1]	< 0.001	0.00562	0.0379	< 0.001	< 0.0005	0.0342	< 0.0005	1.1	< 0.0005	< 0.05	< 0.0002	0.029	1.42	0.0662	< 0.001
	12/20/2016	< 0.001	0.00601	0.035	< 0.001	< 0.0005	0.0312	< 0.0005	1.2	< 0.0005	< 0.05	< 0.0002	0.028	0.672 U	0.0683	< 0.001
	1/23/2017	< 0.001	0.00568	0.0347	< 0.001	< 0.0005	0.0314	< 0.0005	1.2	< 0.0005	< 0.05	< 0.0002	0.0283	0.344	0.0672	< 0.001
	2/21/2017	< 0.001	0.00609	0.0352	< 0.001	< 0.0005	0.0327	< 0.0005	1.3	< 0.0005	< 0.05	< 0.0002	0.0282	0.659	0.0655	< 0.001
	3/22/2017	< 0.001	0.00553	0.0354	< 0.001	< 0.0005	0.0308	< 0.0005	1.3	< 0.0005	0.0123	< 0.0002	0.0273	1.07	0.0594	< 0.001
	4/26/2017	< 0.001	0.00632	0.0344	< 0.001	< 0.0005	0.0329	< 0.0005	1.3	< 0.0005	0.0103	< 0.0002	0.0276	0.607	0.054	< 0.001
	5/26/2017	< 0.001	0.0055	0.0311	< 0.001	< 0.0005	0.0325	< 0.0005	1.3	< 0.0005	0.0125	< 0.0002	0.0229	0.228 U	0.0474	< 0.001
	6/27/2017	< 0.001	0.00529	0.0378	< 0.001	< 0.0005	0.0392	< 0.0005	1.2	< 0.0005	0.013	< 0.0002	0.0234	-0.00269 U	0.0634	< 0.001
	10/11/2017	< 0.001	0.0036	0.0632	< 0.001	< 0.0005	0.0404	< 0.0005	0.86	< 0.0005	0.0151	< 0.0002	0.0195	1.99	0.104	< 0.001
	3/7/2018	0.000202J	0.00393	0.0531	<0.00100	< 0.000500	0.0302	0.000405J	1.34	< 0.000500	0.0134	< 0.000200	0.026	0.694	0.17	< 0.00100
	7/25/2018	<0.00100	0.00399	0.0473	<0.00100	< 0.000500	0.0368	0.000188J	0.896	< 0.000500	0.0117	< 0.000200	0.0404	0.527	0.1	< 0.00100
	10/16/2018	<0.00100	0.00409	0.0623	<0.00100	< 0.000500	0.0306	0.00012J	0.714	< 0.000500	0.0144	< 0.000200	0.026	0.878	0.108	< 0.00100
	3/5/2019	<0.00100	0.00645	0.0469	<0.00100	< 0.000500	0.0484	0.000125J	1.28	0.000703	0.0176	< 0.000200	0.047	0.313 U	0.0588	< 0.00100
	5/15/2019	<0.00300	0.00485	0.0415	<0.00100	< 0.000500	0.0378	<0.00100	1.5	< 0.000500	0.0125	< 0.000200	0.0259	0.352 U	0.0771	<0.00200
	8/28/2019	<0.00100	0.00505	0.0387	<0.00100	< 0.000100	0.0369	0.000149J	1.4	0.000279J	0.0136	< 0.000200	0.0209	Not Sampled	0.0685	< 0.00100
	11/18/2019	0.000709J	0.00499	0.0492	<0.00100	< 0.000100^	0.0389	0.000141J	0.984	< 0.000500	0.0143	< 0.000200	0.0163	0.945	0.106	< 0.00100
	2/17/2020	<0.00100	0.00266	0.0574	<0.00100	<0.000100	0.0485	0.000298J	0.597	<0.000500	0.0172	<0.000200	0.0401	1.30	0.131	<0.00100
	5/6/2020	<0.00100	0.00381	0.0496	<0.00100	<0.000100	0.05	0.000420J	1.41	<0.000500	0.0115	<0.000200	0.0635	Not Sampled ^[3]	0.182	<0.00100
	8/31/2020	<0.00100	0.00507	0.0412	<0.00100	<0.000100	0.0439	0.000217J	1.26	0.000190J	0.0109	<0.000200	0.0462	Not Sampled	0.116	<0.00100
	11/16/2020	<0.00100	0.00498	0.0349	<0.00100	<0.000100	0.0383	0.000166J	1.1	<0.000500	0.0105	<0.000200	0.0396	0.203U	0.0938	<0.00100
	4/19/2021	<0.00200	0.00589	0.0423	<0.00100	<0.000100	0.0445	0.000140J	1.11	<0.000500	0.0108	<0.000200	0.0444	1.17	0.122	<0.00100
	12/7/2021	<0.00200	0.00400	0.0481	<0.00100	<0.000100	0.0435	<0.000500	1.52	<0.000500	0.0120	<0.000200	0.0242	0.94	0.0843	<0.00100
	4/25/2022	<0.00200	0.00318	0.0478	<0.00100	<0.000100	0.0396	<0.000500	0.825J	<0.000500	0.0127	<0.000200	0.0225	0.68	0.107	<0.00100
	11/14/2022	<0.00200	0.00431	0.0465	<0.00100	<0.000100	0.0300	0.000400J	0.451J	<0.000500	0.0109	<0.000200	0.0605	Not Sampled	0.119	<0.00100
	5/20/2023	<0.00200	0.00446	0.0412	<0.00100	<0.000200	0.0408	0.000322J	1.16	<0.000500	0.0123	<0.000200	0.0640	-0.0911U	0.0597	<0.00100
	12/4/2023	<0.00200	0.00513	0.0422	<0.00100	<0.000200	0.0227	<0.000500	1.28	<0.000500	0.0110	<0.000200	0.0560	1.86	0.0505	<0.00100
MW-6	11/16/2016 ^[1]	< 0.001	0.0025	0.0496	< 0.001	< 0.0005	0.00601	< 0.0005	0.36	< 0.0005	< 0.05	< 0.0002	0.00761	2.03	0.0397	< 0.001
	12/20/2016	< 0.001	0.0022	0.0423	< 0.001	< 0.0005	< 0.005	< 0.0005	0.35	< 0.0005	< 0.05	< 0.0002	0.00685	0.453	0.0427	< 0.001
	1/23/2017	< 0.001	0.00234	0.0456	< 0.001	< 0.0005	< 0.005	< 0.0005	0.3	0.0207	< 0.05	< 0.0002	0.00746	1.38 U	0.059	< 0.001
	2/21/2017	< 0.001	0.00336	0.058	< 0.001	< 0.0005	0.00998	< 0.0005	0.34	< 0.0005	< 0.05	< 0.0002	0.0105	0.487	0.0913	< 0.001
	3/22/2017	< 0.001	0.00226	0.0454	< 0.001	< 0.0005	0.00896	< 0.0005	0.34	< 0.0005	0.015	< 0.0002	0.00795	0.988	0.0606	< 0.001

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Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-6	4/26/2017	< 0.001	0.0027	0.051	< 0.001	< 0.0005	0.011	< 0.0005	0.35	< 0.0005	0.0146	< 0.0002	0.00795	1.52	0.0612	< 0.001
	5/26/2017	< 0.001	0.00237	0.0406	< 0.001	< 0.0005	0.0126	< 0.0005	0.35	< 0.0005	0.0164	< 0.0002	0.00771	0.528 U	0.042	< 0.001
	6/27/2017	< 0.001	0.00259	0.0454	< 0.001	< 0.0005	0.0133	< 0.0005	0.36	< 0.0005	0.0163	< 0.0002	0.00831	0.427	0.0415	< 0.001
	10/11/2017	< 0.001	0.00244	0.0535	< 0.001	< 0.0005	0.016	< 0.0005	0.30	< 0.0005	0.015	< 0.0002	0.00713	1.95	0.0528	< 0.001
	3/7/2018	0.000187J	0.00262	0.0443	<0.00100	< 0.000500	0.0241	0.000052J	<0.500	< 0.000500	0.0137	< 0.000200	0.0119	0.575	0.0407	< 0.00100
	7/25/2018	<0.00100	0.00262	0.0483	<0.00100	< 0.000500	0.0202	<0.000500	<0.500	< 0.000500	0.0134	< 0.000200	0.0121	0.376 U	0.0354	< 0.00100
	10/16/2018	<0.00100	0.00283	0.0547	<0.00100	< 0.000500	0.0167	<0.000500	<0.500	< 0.000500	0.014	< 0.000200	0.0115	0.716	0.0343	< 0.00100
	3/5/2019	<0.00100	0.00101	0.0202	<0.00100	< 0.000500	0.0108	<0.000500	0.672	< 0.000500	0.00714	< 0.000200	0.00471	0.705	0.0245	< 0.00100
	5/13/2019	<0.00300	0.00301	0.0858	<0.00100	< 0.000500	0.00961	<0.00100	0.622	0.000558	0.0134	< 0.000200	0.00776	1.03	0.0685	<0.00200
	8/26/2019	<0.00100	0.00243	0.0546	<0.00100	< 0.000100	0.00877	<0.000500	0.330J	< 0.000500	0.0153	< 0.000200	0.00934	Not Sampled	0.0803	< 0.00100
	11/18/2019	<0.00100	0.00317	0.0476	<0.00100	< 0.000100^	0.0141	<0.000500	0.547	< 0.000500	0.015	< 0.000200	0.00965	0.45	0.108	< 0.00100
	2/17/2020	<0.00100	0.00231	0.0421	<0.00100	<0.000100	0.0252	<0.000500	<0.500	<0.000500	0.0147	<0.000200	0.00998	1.70	0.178	<0.00100
	5/6/2020	<0.00100	0.00259	0.0512	<0.00100	<0.000100	0.0229	<0.000500	0.635	<0.000500	0.0114	<0.000200	0.00831	Not Sampled ^[3]	0.135	<0.00100
	8/31/2020	<0.00100	0.00226	0.0401	<0.00100	<0.000100	0.0261	<0.000500	0.639	<0.000500	0.0122	<0.000200	0.00998	Not Sampled	0.049	<0.00100
	11/16/2020	<0.00100	0.00203	0.0433	<0.00100	<0.000100	0.0244	<0.000500	0.416J	<0.000500	0.0134	<0.000200	0.00793	0.485	0.0601	<0.00100
	4/19/2021	<0.00200	0.00229	0.0481	<0.00100	<0.000100	0.0225	<0.000500	0.433J	<0.000500	0.0136	<0.000200	0.0100	1.22	0.0406	<0.00100
	12/7/2021	<0.00200	0.00233	0.0449	<0.00100	<0.000100	0.00631	<0.000500	0.779	<0.000500	0.0136	<0.000200	0.0138	0.738	0.0337	<0.00100
	4/18/2022	0.00103J	0.00275	0.0543	<0.00100	<0.000100	0.0113	<0.000500	<1.00	<0.000500	0.0132	<0.000200	0.0142	1.13	0.0812	<0.00100
	11/14/2022	<0.00200	0.00243	0.0519	<0.00100	<0.000100	0.0172	<0.000500	<0.500	<0.000500	0.0141	<0.000200	0.00984	Not Sampled	0.0790	<0.00100
	4/20/2023	<0.00200	0.00226	0.0540	<0.00100	<0.000200	0.0230	<0.000500	0.403J	<0.000500	0.0140	<0.000200	0.0106	0.972	0.108	<0.00100
	12/4/2023	<0.00200	0.00281	0.0491	<0.00100	<0.000200	0.0169	<0.000500	0.400J	<0.000500	0.0131	<0.000200	0.0108	1.25	0.0663	<0.00100
MW-7	11/16/2016 ^[1]	< 0.001	0.00338	0.0518	< 0.001	< 0.0005	0.0241	< 0.0005	0.38	< 0.0005	< 0.05	< 0.0002	0.0262	1.27	0.045	< 0.001
	12/20/2016	< 0.001	0.00327	0.0688	< 0.001	< 0.0005	0.0129	< 0.0005	0.36	< 0.0005	< 0.05	< 0.0002	0.0229	0.622	0.0576	< 0.001
	1/23/2017	< 0.001	0.00293	0.09	< 0.001	< 0.0005	0.00689	< 0.0005	0.27	< 0.0005	< 0.05	< 0.0002	0.0193	2.42	0.0649	< 0.001
	2/21/2017	< 0.001	0.00351	0.088	< 0.001	< 0.0005	0.00959	< 0.0005	0.33	< 0.0005	< 0.05	< 0.0002	0.0219	1.01	0.0714	< 0.001
	3/22/2017	< 0.001	0.00321	0.073	< 0.001	< 0.0005	0.00827	< 0.0005	0.36	< 0.0005	0.0172	< 0.0002	0.0222	2.11	0.0568	< 0.001
	4/26/2017	< 0.001	0.0038	0.0649	< 0.001	< 0.0005	0.00562	< 0.0005	0.38	< 0.0005	0.014	< 0.0002	0.0201	1.06	0.0477	< 0.001
	5/26/2017	< 0.001	0.00333	0.0625	< 0.001	< 0.0005	< 0.005	< 0.0005	0.37	< 0.0005	0.017	< 0.0002	0.017	1.19 U	0.0469	< 0.001
	6/27/2017	< 0.001	0.00308	0.086	< 0.001	< 0.0005	0.00613	< 0.0005	0.34	< 0.0005	0.0184	< 0.0002	0.0145	0.948	0.0475	< 0.001
	10/11/2017	< 0.001	0.00368	0.0647	< 0.001	< 0.0005	0.00956	< 0.0005	0.34	< 0.0005	0.0157	< 0.0002	0.0147	1.57	0.0459	< 0.001
	3/7/2018	<0.00100	0.00411	0.051	<0.00100	< 0.000500	0.0264	0.000104J	0.604	< 0.000500	0.0146	< 0.000200	0.0194	0.439	0.0998	< 0.00100
	7/25/2018	<0.00100	0.00421	0.0518	<0.00100	< 0.000500	0.029	0.00008J	<0.500	< 0.000500	0.0128	< 0.000200	0.0203	0.73	0.0677	< 0.00100
	10/16/2018	<0.00100	0.00378	0.0489	<0.00100	< 0.000500	0.0282	<0.000500	<0.500	< 0.000500	0.0151	< 0.000200	0.0248	0.721	0.0414	< 0.00100
	3/5/2019	<0.00100	0.0032	0.052	<0.00100	< 0.000500	0.0295	<0.000500	<0.500	< 0.000500	0.0143	< 0.000200	0.0227	0.925	0.0678	< 0.00100
	5/13/2019	<0.00300	0.00361	0.0534	<0.00100	< 0.000500	0.0318	0.00045J	0.852	< 0.000500	0.0126	< 0.000200	0.0258	0.917	0.0644	<0.00200
	8/26/2019	<0.00100	0.00386	0.0528	<0.00100	< 0.000100	0.0232	<0.000500	0.254J	< 0.000500	0.0146	< 0.000200	0.0284	Not Sampled	0.0516	< 0.00100
	11/18/2019	<0.00100	0.0042	0.0644	<0.00100	< 0.000100^	0.0167	<0.000500	<0.500	< 0.000500	0.0141	< 0.000200	0.0222	1.66	0.0719	< 0.00100
	2/17/2020	<0.00100	0.00347	0.0603	<0.00100	<0.000100	0.0287	0.000103J	0.289J	<0.000500	0.0159	<0.000200	0.0213	1.56	0.0457	<0.00100
	5/6/2020	<0.00100	0.00415	0.0407	<0.00100	<0.000100	0.0264	0.0000910J	0.517	<0.000500	0.00936J	<0.000200	0.0255	Not Sampled ^[3]	0.0421	<0.00100
	8/31/2020	<0.00100	0.00442	0.0402	<0.00100	<0.000100	0.0302	<0.000500	0.758	<0.000500	0.011	<0.000200	0.0286	Not Sampled	0.0255	<0.00100
	11/16/2020	0.00103	0.00417	0.0388	<0.00100	<0.000100	0.0267	<0.000500	0.658	<0.000500	0.0117	<0.000200	0.0245	0.423	0.0381	<0.00100
	4/20/2021	<0.00200	0.00360	0.0456	<0.00100	0.0000610J	0.0235	0.000164J	0.448J	0.000497J	0.0118	<0.000200	0.0231	0.893	0.0543	<0.00100

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

Constituent Reporting Unit		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-7	12/7/2021	<0.00200	0.00279	0.0639	<0.00100	<0.000100	0.0148	<0.000500	0.67	<0.000500	0.0168	<0.000200	0.0221	1.33	0.0545	<0.00100
	4/25/2022	<0.00200	0.00285	0.0417	<0.00100	<0.000100	0.0062	<0.000500	0.371J	<0.000500	0.0226	<0.000200	0.0128	Not Sampled ^[4]	0.0481	<0.00100
	11/14/2022	<0.00200	0.00349	0.0311	<0.00100	<0.000100	0.00925	<0.000500	<0.500	<0.000500	0.0138	<0.000200	0.0113	1.14	0.0539	<0.00100
	4/20/2023	<0.00200	0.00351	0.0312	<0.00100	<0.000200	0.0166	<0.000500	0.630J	<0.000500	0.0164	<0.000200	0.0138	0.787	0.0502	<0.00100
	12/5/2023	<0.00200	0.00295	0.0347	<0.00100	<0.000200	0.0164	<0.000500	0.649J	<0.000500	0.0149	<0.000200	0.0146	1.39	0.0540	<0.00100
MW-8	11/16/2016 ^[1]	< 0.001	0.00429	0.0498	< 0.001	< 0.0005	0.0332	< 0.0005	0.63	< 0.0005	< 0.05	< 0.0002	0.0499	0.56 U	0.035	< 0.001
	12/20/2016	< 0.001	0.00347	0.0456	< 0.001	< 0.0005	0.0347	< 0.0005	0.63	< 0.0005	< 0.05	< 0.0002	0.0479	0.397 U	0.0396	< 0.001
	1/23/2017	< 0.001	0.00333	0.0433	< 0.001	< 0.0005	0.0347	< 0.0005	0.58	0.0613	< 0.05	< 0.0002	0.0455	0.860 U	0.0374	< 0.001
	2/21/2017	< 0.001	0.00374	0.0516	< 0.001	< 0.0005	0.037	< 0.0005	0.64	< 0.0005	< 0.05	< 0.0002	0.0481	0.964	0.0415	< 0.001
	3/22/2017	< 0.001	0.00316	0.0448	< 0.001	< 0.0005	0.0326	< 0.0005	0.69	< 0.0005	0.0118	< 0.0002	0.0425	1.18	0.04	< 0.001
	4/26/2017	< 0.001	0.00414	0.0516	< 0.001	< 0.0005	0.0382	< 0.0005	0.76	< 0.0005	0.0122	< 0.0002	0.0458	0.678 U	0.0441	< 0.001
	5/26/2017	< 0.001	0.00345	0.0545	< 0.001	< 0.0005	0.0303	< 0.0005	0.75	< 0.0005	0.0141	< 0.0002	0.0384	0.103 U	0.0368	< 0.001
	6/27/2017	< 0.001	0.00338	0.0535	< 0.001	< 0.0005	0.031	< 0.0005	0.77	< 0.0005	0.013	< 0.0002	0.04	0.293 U	0.04	< 0.001
	10/11/2017	< 0.001	0.00384	0.0385	< 0.001	< 0.0005	0.0292	< 0.0005	0.81	< 0.0005	0.0111	< 0.0002	0.0385	0.894	0.0484	< 0.001
	3/7/2018	<0.00100	0.00394	0.0423	<0.00100	< 0.000500	0.0456	0.000103J	1.12	< 0.000500	0.0112	< 0.000200	0.0407	0.517	0.0741	< 0.00100
	7/26/2018	<0.00100	0.0045	0.0402	<0.00100	< 0.000500	0.0433	0.000129J	0.969	< 0.000500	0.0101	< 0.000200	0.0601	0.21 U	0.145	< 0.00100
	10/16/2018	<0.00100	0.00472	0.0403	<0.00100	< 0.000500	0.0393	0.000095J	0.724	< 0.000500	0.0111	< 0.000200	0.0552	0.466	0.0829	< 0.00100
	3/5/2019	<0.00100	0.00575	0.0545	<0.00100	< 0.000500	0.0494	0.000199J	1.11	< 0.000500	0.0139	< 0.000200	0.0661	0.516	0.0809	< 0.00100
	5/13/2019	<0.00300	0.0055	0.0449	<0.00100	< 0.000500	0.0335	<0.00100	1.36	< 0.000500	0.0111	< 0.000200	0.0705	0.506	0.0506	<0.00200
	8/26/2019	<0.00100	0.00509	0.0439	<0.00100	< 0.000100	0.034	0.000227J	0.888	0.000288J	0.0123	< 0.000200	0.0417	Not Sampled	0.0348	< 0.00100
	11/18/2019	<0.00100	0.00449	0.0646	<0.00100	< 0.000100^	0.0349	0.000131J	1.08	< 0.000500	0.0129	< 0.000200	0.0381	1.2	0.0697	< 0.00100
	2/17/2020	<0.00100	0.00414	0.0393	<0.00100	<0.000100	0.0380	<0.000500	0.782	<0.000500	0.0127	<0.000200	0.0387	0.708	0.0768	<0.00100
	5/7/2020	<0.00100	0.004	0.0358	<0.00100	0.0000880J	0.0380	0.000102J	1.36	0.000302J	0.00837J	<0.000200	0.0371	Not Sampled ^[3]	0.0293	<0.00100
	8/31/2020	<0.00100	0.0037	0.0346	<0.00100	<0.000100	0.0483	<0.000500	1.22	<0.000500	0.0101	<0.000200	0.0381	Not Sampled	0.0417	<0.00100
	11/16/2020	<0.00100	0.00329	0.0383	<0.00100	<0.000100	0.0445	<0.000500	0.886	<0.000500	0.0103	<0.000200	0.0318	0.313U	0.0408	<0.00100
	4/19/2021	<0.00200	0.00417	0.0415	<0.00100	<0.000100	0.0370	0.000122J	1.01	<0.000500	0.0102	<0.000200	0.0301	1.09	0.0596	<0.00100
	12/7/2021	<0.00200	0.00444	0.038	<0.00100	<0.000100	0.0486	<0.000500	3.17	<0.000500	0.0101	<0.000200	0.0435	1.24	0.0428	<0.00100
	4/25/2022	<0.00200	0.00452	0.0321	<0.00100	<0.000100	0.0431	0.000243J	0.947	<0.000500	0.00987J	<0.000200	0.0767	0.559	0.0572	<0.00100
	11/14/2022	<0.00200	0.00408	0.0370	<0.00100	<0.000100	0.0327	<0.000500	0.281J	<0.000500	0.00884J	<0.000200	0.0617	Not Sampled	0.0778	<0.00100
	4/20/2023	<0.00200	0.00448	0.0471	<0.00100	<0.000200	0.0384	<0.000500	0.949J	<0.000500	0.0120	<0.000200	0.0336	0.481U	0.107	<0.00100
	12/5/2023	<0.00200	0.00371	0.0484	<0.00100	<0.000200	0.0330	<0.000500	0.782J	<0.000500	0.0117	<0.000200	0.0252	0.725	0.0602	<0.00100
MW-9	11/16/2016 ^[1]	< 0.001	0.00284	0.0456	< 0.001	< 0.0005	0.027	< 0.0005	1.0	< 0.0005	< 0.05	< 0.0002	0.0248	0.636 U	0.0586	< 0.001
	12/20/2016	< 0.001	0.00283	0.0462	< 0.001	< 0.0005	0.029	< 0.0005	0.97	< 0.0005	< 0.05	< 0.0002	0.0245	0.269 U	0.0638	< 0.001
	1/23/2017	< 0.001	0.0029	0.0467	< 0.001	< 0.0005	0.0278	< 0.0005	0.87	< 0.0005	< 0.05	< 0.0002	0.0235	0.953 U	0.0684	< 0.001
	2/21/2017	< 0.001	0.00317	0.0507	< 0.001	< 0.0005	0.0262	< 0.0005	0.91	< 0.0005	< 0.05	< 0.0002	0.0232	0.747	0.0686	< 0.001
	3/22/2017	< 0.001	0.00289	0.0531	< 0.001	< 0.0005	0.0166	< 0.0005	0.91	< 0.0005	0.0128	< 0.0002	0.0214	1.49	0.0591	< 0.001
	4/26/2017	< 0.001	0.00344	0.0477	< 0.001	< 0.0005	0.0095	< 0.0005	0.9	< 0.0005	0.0115	< 0.0002	0.0197	1.3	0.0458	< 0.001
	5/26/2017	< 0.001	0.00323	0.0437	< 0.001	< 0.0005	0.0109	fa	0.87	< 0.0005	0.0144	< 0.0002	0.0188	0.977	0.0461	< 0.001
	6/27/2017	< 0.001	0.00305	0.0529	< 0.001	< 0.0005	0.0157	< 0.0005	0.85	< 0.0005	0.0129	< 0.0002	0.0201	0.571	0.049	< 0.001
	10/11/2017	< 0.001	0.00252	0.0473	< 0.001	< 0.0005	0.0318	< 0.0005	0.59	< 0.0005	0.0102	< 0.0002	0.0222	1.49	0.0345	< 0.001
	3/7/2018	<0.00100	0.00199J	0.0551	<0.00100	< 0.000500	0.0274	0.000049J	0.639	< 0.000500	0.01	< 0.000200	0.015	0.71	0.0241	< 0.00100
	7/25/2018	<0.00100	0.00124J	0.0431	<0.00100	< 0.000500	0.0265	<0.000500	0.472J	< 0.000500	0.00699J	< 0.000200	0.0135	0.7	0.0373	< 0.00100
	10/16/2018	<0.00100	0.00193J	0.0425	<0.00100	< 0.000500	0.0294	<0.000500	0.618	< 0.000500	0.00889J	< 0.000200	0.0251	0.613	0.039	< 0.00100
	3/5/2019	<0.00100	0.00282	0.055	<0.00100	< 0.000500	0.0318	<0.000500	1.33	< 0.000500	0.0101	< 0.000200	0.0306	0.933	0.404	< 0.00100
	5/13/2019	<0.00300	0.00297	0.049	<0.00100	< 0.000500	0.0282	<0.00100	1.56	< 0.000500	0.00853	< 0.000200	0.029	0.658	0.0447	<0.00200

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2024

		Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
MW-9	8/26/2019	<0.00100	0.00339	0.0428	<0.00100	< 0.000100	0.0306	<0.000500	0.956	< 0.000500	0.0109	< 0.000200	0.029	Not Sampled	0.0598	< 0.00100
	11/18/2019	<0.00100	0.0051	0.0426	<0.00100	< 0.000100^	0.0265	<0.000500	1.08	< 0.000500	0.0101	< 0.000200	0.0313	0.769	0.387	< 0.00100
	2/17/2020	<0.00100	0.00291	0.0516	<0.00100	<0.000100	0.0271	<0.000500	0.798	<0.000500	0.0119	<0.000200	0.0204	0.982	0.0501	<0.00100
	5/6/2020	<0.00100	0.00209	0.0473	<0.00100	<0.000100	0.0298	<0.000500	0.992	<0.000500	0.00670J	<0.000200	0.0182	Not Sampled ^[3]	0.0363	<0.00100
	8/31/2020	<0.00100	0.00229	0.0563	<0.00100	<0.000100	0.0469	<0.000500	0.813	<0.000500	0.00953J	<0.000200	0.0175	Not Sampled	0.0637	<0.00100
	11/16/2020	<0.00100	0.0028	0.0431	<0.00100	<0.000100	0.0469	<0.000500	1.14	<0.000500	0.00990J	<0.000200	0.0241	0.531	0.0751	<0.00100
	4/19/2021	<0.00200	0.00184J	0.0604	<0.00100	<0.000100	0.0343	<0.000500	0.717	<0.000500	0.00869J	<0.000200	0.0163	2.68	0.0578	<0.00100
	12/7/2021	<0.00200	0.00246	0.0680	<0.00100	<0.000100	0.00426J	<0.000500	1.02	<0.000500	0.00954J	<0.000200	0.0137	2.17	0.0277	<0.00100
	4/25/2022	<0.00200	0.00296	0.0683	<0.00100	<0.000100	0.0114	<0.000500	<1.00	<0.000500	0.0121	<0.000200	0.0193	0.681	0.0394	<0.00100
	11/14/2022	<0.00200	0.00201	0.0573	<0.00100	<0.000100	0.0283	<0.000500	<0.000500	<0.000500	0.00945J	<0.000200	0.0176	Not Sampled	0.0340	<0.00100
	4/20/2023	<0.00200	0.00134J	0.0657	<0.00100	<0.000200	0.0600	<0.000500	0.753J	<0.000500	0.00918J	<0.000200	0.0143	0.301U	0.0266	<0.00100
	12/4/2023	<0.00200	0.00246	0.0532	<0.00100	<0.000200	0.0575	<0.000500	1.39	<0.000500	0.00982J	<0.000200	0.0301	2.27	0.0880	<0.00100

Notes:
[1] Radium was sampled at a later date in November (11/28/2016) than other constituents which were sampled on 11/16/2016 & 11/17/2016.
[2] MW-2B not sampled in November 2016.
[3] Radium was not sampled during the May 2020 event, so radium data from February 17, 2020 was used for the Spring 2020 Title 132 report and statistical analysis.
[4] Radium was not sampled at MW-1 and MW-7 during the spring 2022 sampling event due to a preservative error made by the lab. Radium at these wells was sampled during the fall 2022 sampling event.
* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).
< For the period of November 2016 through October 2019, the symbol indicates analyte not detected above the reporting limit, which is the value shown following the "<" symbol. Starting in January 2020, the symbol indicates analyte not detected above the method detection limit, which is the value shown following the "<" symbol.
"U" data qualifier (radium) indicates parameter was analyzed for but not detected above limiting criteria (minimum detectable concentration) as defined in the analytical laboratory data package.
"J" data qualifer indicates the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

Table 6 - Background Threshold Values for Assessment Monitoring

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

Constituents	Units	Background Threshold Values (UPLs) - 2022 ^[1]
Appendix III		
Boron	mg/l	1.64
Calcium	mg/l	74.6
Chloride	mg/l	34.7
Fluoride*	mg/l	1.50
pH (LPL)**	SU	6.20
pH (UPL)***	SU	7.47
Sulfate	mg/l	198
TDS	mg/l	576
Appendix IV		
Antimony	mg/l	0.002
Arsenic	mg/l	0.00628
Barium	mg/l	0.0613
Beryllium	mg/l	0.00100
Cadmium	mg/l	0.000100
Chromium	mg/l	0.0484
Cobalt	mg/l	0.00100
Fluoride*	mg/l	1.50
Lead	mg/l	0.0207
Lithium	mg/l	0.0171
Mercury	mg/l	0.0002
Molybdenum	mg/l	0.0467
Radium 226 + 228	pCi/l	2.03
Selenium	mg/l	0.140
Thallium	mg/l	0.00100

Notes:

^[1] BTVs were updated in fall 2022. BTVs are updated approximately every two (2) years. The next background update is scheduled for fall 2024.

* Fluoride is listed in both Appendix III and Appendix IV of the CCR Final Rule (40 CFR Part 257).

** Indicates the lower bound of the range is the lower prediction limit (LPL).

*** Indicates the upper bound is the upper prediction limit (UPL).

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Table 7 - Established Groundwater Protection Standards

Groundwater Monitoring and Corrective Action Report

Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities

January 2024

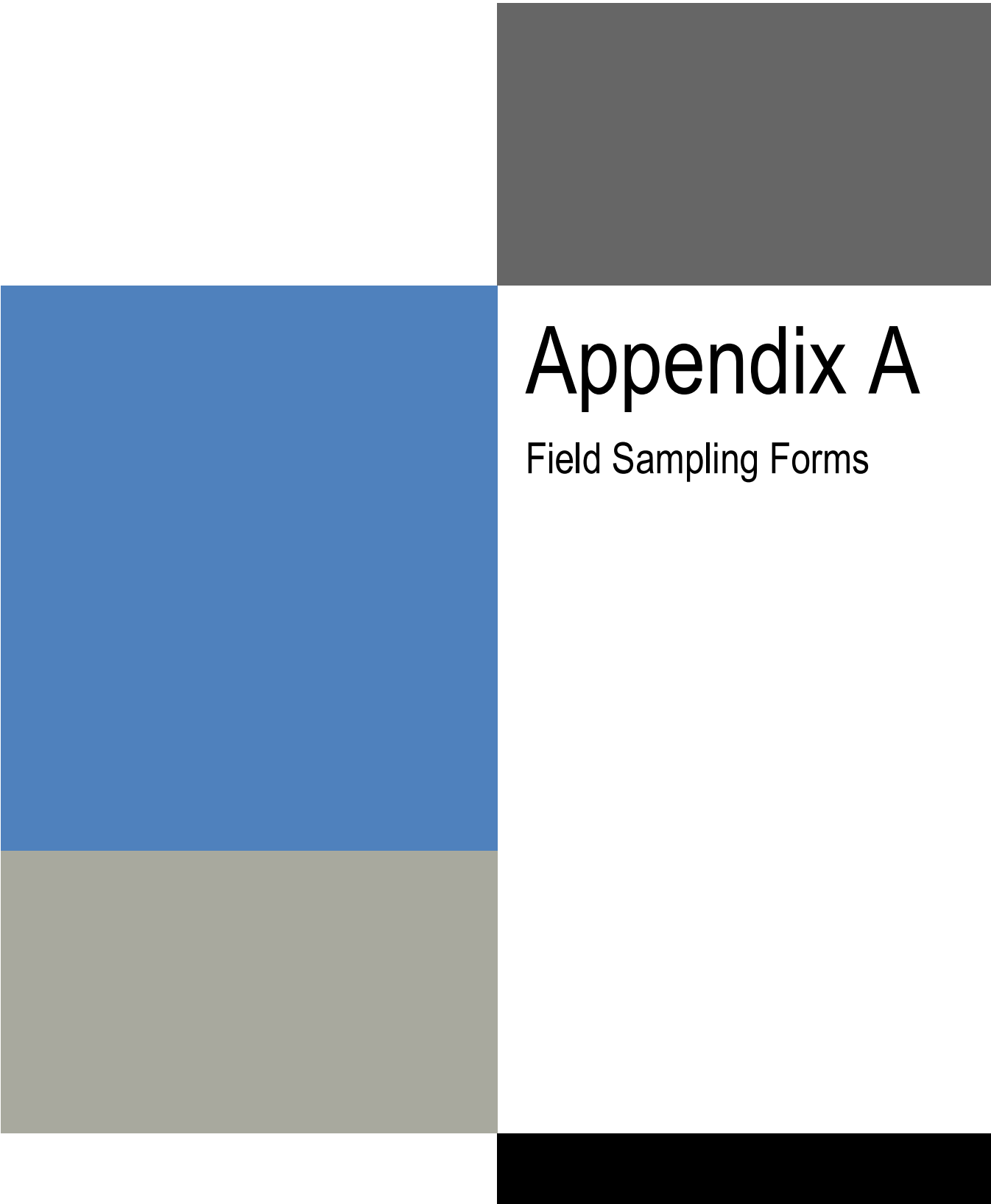
Constituents	Units	Established Groundwater Protection Standard (GWPS) ^[1]
Appendix IV		
Antimony	mg/l	0.006
Arsenic	mg/l	0.01
Barium	mg/l	2.00
Beryllium	mg/l	0.004
Cadmium	mg/l	0.005
Chromium	mg/l	0.10
Cobalt	mg/l	0.006
Fluoride	mg/l	4.00
Lead	mg/l	0.0207 ^[2]
Lithium	mg/l	0.04
Mercury	mg/l	0.002
Molybdenum	mg/l	0.1
Radium 226 + 228	pCi/l	5.00
Selenium	mg/l	0.140 ^[2]
Thallium	mg/l	0.002

Notes:

^[1] - GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2); unless otherwise specified.

^[2] - GWPS is established as the upper prediction limit (UPL) when the background level is higher than the U.S. EPA MCL or the GWPS specified in §257.95(h)(2).

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Appendix A

Field Sampling Forms

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Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-01	Weather CLR P.CLDY CLDY FOG		Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 54 °F Wind Calm Mod High		Personnel:
Sample Date: 4/20/23	Precip Rain Lite Mod High Snow Lite Mod High		Sample Time: 12:50

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: 12:22	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 125.05	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
12:38		6.74	0.499	0.80	5.26	14.8	249.7
12:40		6.72	0.497	0.58	5.04	14.5	250.6
12:42		6.70	0.495	0.78	5.31	14.4	252.1
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl.Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-2B	Weather CLR P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 54 °F Wind Calm Mod High	Personnel:
Sample Date: 4/20/23	Precip Rain- Lite Mod High Snow- Lite Mod High	Sample Time: 13:25

Purging Information

Date: 4/20/23	Time Started: 13:04	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 134.90	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
13:19		6.82	0.55	0.17	6.48	13.9	277.0
13:21		6.88	0.55	0.13	6.57	13.9	277.7
13:23		6.86	0.55	0.16	6.51	13.9	278.2
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Silty Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-3R</u>	Weather: <u>CLD</u> CLR CLDY CLDY FOG	Prepared By: <u>J. S. D. D.</u>
Sample Media: Groundwater	Temp: <u>40</u> °F Wind: Calm Mod: <u>High</u>	Personnel:
Sample Date: <u>4/21/23</u>	Precip: <u>Rain- Lite</u> Mod High Snow- Lite Mod High	Sample Time: <u>12:30</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>12:10</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>121.50</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>12:24</u>		<u>6.63</u>	<u>0.60</u>	<u>0.77</u>	<u>5.06</u>	<u>14.2</u>	<u>305.6</u>
<u>12:26</u>		<u>6.64</u>	<u>0.61</u>	<u>0.64</u>	<u>5.04</u>	<u>13.9</u>	<u>305.2</u>
<u>12:28</u>		<u>6.62</u>	<u>0.60</u>	<u>0.86</u>	<u>5.02</u>	<u>14.0</u>	<u>304.6</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> SL Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) <u>Monthly</u> Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: <u>MW-4B</u>	Weather <u>CLR</u> <u>P.CLDY</u> CLDY FOG	Prepared By: _____
Sample Media: Groundwater	Temp <u>46</u> °F Wind Calm <u>Mod</u> High	Personnel: _____
Sample Date: <u>4/20/23</u>	Precip <u>Rain</u> <u>Lite</u> <u>Med</u> <u>High</u> <u>Snow</u> <u>Lite</u> <u>Med</u> <u>High</u>	Sample Time: <u>11:05</u>

Purging Information

Date: <u> / / </u>	Time Started: <u>10:45</u>	Time Completed: _____
Method: Electric 12V DC Sampling Pump		
Water Level: <u>115.34</u>	Purge Rate: _____	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>10:58</u>		<u>6.50</u>	<u>0.498</u>	<u>0.70</u>	<u>4.42</u>	<u>13.5</u>	<u>221.7</u>
<u>11:00</u>		<u>6.51</u>	<u>0.500</u>	<u>0.74</u>	<u>4.41</u>	<u>13.5</u>	<u>222.6</u>
<u>11:02</u>		<u>6.55</u>	<u>0.500</u>	<u>0.65</u>	<u>4.37</u>	<u>13.5</u>	<u>224.3</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-53</u>	Weather CLR P.CLDY <u>CLDY</u> FOG	Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>46</u> °F Wind Calm <u>Mod</u> High	Personnel:
Sample Date: <u>4/20/23</u>	Precip Rain <u>Lite</u> Mod High Snow <u>Lite</u> Mod High	Sample Time: <u>9:15</u>

Purging Information

Date: ___/___/___	Time Started: <u>8:52</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>118.12</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
<u>9:07</u>		<u>7.18</u>	<u>0.433</u>	<u>0.24</u>	<u>7.27</u>	<u>13.1</u>	<u>186.2</u>
<u>9:09</u>		<u>7.19</u>	<u>0.430</u>	<u>0.20</u>	<u>7.26</u>	<u>13.1</u>	<u>189.8</u>
<u>9:11</u>		<u>7.19</u>	<u>0.430</u>	<u>0.32</u>	<u>7.20</u>	<u>13.1</u>	<u>194.0</u>
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl. Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: <u>MW-06</u>	Weather CLR P.CLDY CLDY FOG	Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>46</u> °F Wind Calm Mod High	Personnel:
Sample Date: <u>4/20/23</u>	Precip Rain Lite Mod High Snow Lite Mod High	Sample Time: <u>10:20</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>10:03</u>	Time Completed: <u>10:30</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>113.35</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
10:15		6.72	0.476	2.37	7.11	14.2	226.7
10:17		6.74	0.473	0.52	7.09	14.2	226.8
10:19		6.84	0.474	0.52	7.14	14.2	227.7
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: <u>YES</u> / NO If yes, Sample ID <u>MW-107</u>
Sample No: <u>MW-07</u>	Weather: <u>CLR</u> P.CLDY CLDY FOG	Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp: <u>55</u> °F Wind Calm (<u>Mod</u>) High	Personnel:
Sample Date: <u>4/20/23</u>	Precip: Rain Lite Mod High Snow Lite Mod High	Sample Time: <u>12:05</u>

4/20/23
8:40am

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>11:45</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>122.92</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
11:58		6.62	0.482	0.47	4.73	14.0	255.9
12:00		6.61	0.484	0.18	4.71	14.0	257.5
12:02		6.64	0.485	0.21	4.77	14.0	258.6
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> S.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-08	Weather CLR CLOUDY CLDY FOG	Prepared By: J Sidlo
Sample Media: Groundwater	Temp 54 °F Wind Calm Mod High	Personnel:
Sample Date: 4/20/23	Precip Rain Lite Mod High Snow Lite Mod High	Sample Time: 13:55

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: 13:38	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 124.0	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
13:50		7.13	0.450	0.30	5.71	14.4	201.0
13:52		7.13	0.447	0.28	5.78	14.4	200.5
13:54		7.12	0.445	0.26	5.73	14.4	200.1
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-09</u>	Weather CLR P.CLDY <u>CLDY</u> FOG	Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp <u>46</u> F Wind Calm <u>Mod</u> High	Personnel:
Sample Date: <u>4/20/23</u>	Precip <u>Rain</u> Lite <u>Mod</u> High <u>Snow</u> Lite <u>Mod</u> High	Sample Time: <u>9:50</u>

Purging Information

Date: <u> / / </u>	Time Started: <u>9:30</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>113.18</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
9:44		7.02	0.379	0.41	9.21	11.2	217.9
9:46		7.01	0.380	0.44	9.27	11.2	219.2
9:48		7.00	0.377	0.41	9.18	11.2	219.7
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> SI.Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly		Duplicate Collected: YES / (NO) If yes, Sample ID _____	
Sample No: <u>MW-01</u>		Weather (CLR) P.CLDY CLDY FOG		Prepared By: <u>J. Sidlo</u>	
Sample Media: Groundwater		Temp <u>43</u> °F Wind (Calm) Mod High		Personnel:	
Sample Date: <u>12/5/23</u>		Precip <u>Rain</u> - Lite - Mod - High Snow - Lite - Mod - High		Sample Time: <u>13:15</u>	

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>12:50</u>	Time Completed: <u>13:05</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>126.55</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (µmS/cm)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
13:05		6.84	0.446	2.04	4.55	14.6	218.5
13:08		6.85	0.446	1.23	4.50	14.7	220.3
13:11		6.85	0.446	1.09	4.49	14.6	222.5
13:14		6.85	0.445	0.80	4.51	14.7	224.4
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) (Clear) Sl. Cloudy Cloudy	Odor (circle one) (None) Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Field Blank

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID <u>FB-01 12-5-23 9:00</u>
Sample No: <u>MW-2B</u>	Weather: <u>CLR</u> P.CLDY CLDY FOG	Prepared By: <u>J Sidlo</u>	
Sample Media: Groundwater	Temp <u>43</u> °F Wind <u>Calm</u> Mod High	Personnel:	
Sample Date: <u>12/5/23</u>	Precip Rain <u>None</u> Lite Mod High Snow <u>None</u> Lite Mod High	Sample Time: <u>14:00</u>	

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>13:35</u>	Time Completed: <u>14:15</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>139.35</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m) <i>(S/cm) * 1000</i>	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
13:50		6.92	0.56	0.17	4.96	13.9	258.2
13:53		6.93	0.56	0.16	4.94	13.9	262.6
13:56		6.93	0.56	0.15	4.91	13.9	263.2
13:59		6.94	0.56	0.33	4.84	13.9	263.8
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl.CLOUDY Cloudy	Odor (circle one) <u>None</u> Strong Weak
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Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-3R	Weather CLR P.CLDY CLDY FOG		Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 55 °F Wind Calm Mod High		Personnel:
Sample Date: 12/7/23	Precip Rain Light Mod High Snow Light Mod High		Sample Time: 14:10

Purging Information

Date: ____/____/____	Time Started: 13:45	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 123.15	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m) <i>ms/cm</i>	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:00		6.57	0.57	0.39	4.19	14.2	299.4
14:03		6.56	0.57	0.26	4.23	14.3	299.8
14:06		6.57	0.57	0.23	4.26	14.3	299.9
14:09		6.57	0.57	0.29	4.25	14.3	300.0
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
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Field Notes:

Depth ~ 133' ?

Used spare pump

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID: _____
Sample No: MW-4B	Weather CLR P.CLDY CLDY FOG		Prepared By: J. Sidle
Sample Media: Groundwater	Temp 32 °F Wind Calm Mod High		Personnel:
Sample Date: 12/5/23	Precip Rain Lite Mod High Snow Lite Mod High		Sample Time: 9:40

Purging Information

Date: ____/____/____	Time Started: 9:15	Time Completed: 9:50
Method: Electric 12V DC Sampling Pump		
Water Level: 117.7	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m) mS/cm	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
9:30		6.68	0.464	6.44	2.68	14.8	228.0
9:33		6.67	0.480	5.89	2.66	14.8	229.0
9:36		6.68	0.484	4.09	2.62	14.9	229.4
9:39		6.67	0.483	2.78	2.64	14.8	230.1
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl.Cloudy Cloudy	Odor (circle one) None Strong Weak
---	---

Field Notes:

Lots of bubbles in line

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID _____
Sample No: MW-5B	Weather CLR P.CLDY CLDY FOG Temp 48 F Wind Calm Mod High Precip Rain Light Mod High Snow Light Mod High		Prepared By: J. Sidlo
Sample Media: Groundwater		Personnel:	
Sample Date: 12/4/23		Sample Time: 14:10	

Purging Information

Date: ____/____/____	Time Started: 13:45	Time Completed: 14:20
Method: Electric 12V DC Sampling Pump		
Water Level: 119.70	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:00		7.25	443.0	0.50	5.31	13.2	223.6
14:03		7.26	440.9	0.56	5.33	13.2	230.4
14:06		7.28	440.5	0.27	5.20	13.2	237.7
14:09		7.29	440.7	0.29	5.05	13.1	241.4
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) Clear Sl. Cloudy Cloudy	Odor (circle one) None Strong Weak
---	--

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / (NO) If yes, Sample ID _____
Sample No: MW-06 MW-05	Weather CLR P.CLDY (CLDY) FOG Temp 48 °F Wind Calm (Mod) High Precip Rain- (Lgt) Mod High Snow- Lite Mod High		Prepared By: J. Sidlo
Sample Media: Groundwater			Personnel:
Sample Date: 12/4/23			Sample Time: 15:55

Purging Information

Date: ____/____/____	Time Started: 15:30	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 115.20	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m) (S/cm)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
15:45		7.16	0.479	4.62	5.70	13.7	207.5
15:48		7.15	0.478	2.75	5.66	13.7	214.3
15:51		7.15	0.479	2.43	5.67	13.8	216.7
15:53		7.15	0.478	2.24	5.57	13.8	217.4
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) (Clear) Sl. Cloudy Cloudy	Odor (circle one) (None) Strong Weak
---	--

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE		(Circle One) Monthly Quarterly	Duplicate Collected: YES / <u>NO</u> If yes, Sample ID _____
Sample No: <u>MW-07</u>	Weather: <u>CLR</u> P.CLDY CLDY FOG		Prepared By: <u>J. Sidlo</u>
Sample Media: Groundwater	Temp: <u>32</u> °F Wind: <u>Calm</u> Mod High		Personnel:
Sample Date: <u>12/5/23</u>	Precip: Rain Lite Mod High Snow Lite Mod High		Sample Time: <u>10:35</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>10:10</u>	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: <u>124.47</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (µm/cm)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
10:25		6.80	0.498	0.33	3.91	13.9	264.7
10:28		6.79	0.498	0.16	3.94	14.0	266.9
10:31		6.79	0.498	0.17	3.91	14.0	266.9
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Silty Cloudy Cloudy	Odor (circle one) <u>None</u> Strong Weak
--	---

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: <u>YES</u> NO If yes, Sample ID <u>MW-108 12-5-23 11:30</u>
Sample No: <u>MW-08</u>	Weather <u>CLDY</u> P.CLDY CLDY FOG	Prepared By: <u>JSidlo</u>
Sample Media: Groundwater	Temp <u>43</u> °F Wind <u>Calm</u> Mod High	Personnel:
Sample Date: <u>12/5/23</u>	Precip Rain Lite Mod High Snow- Lite Mod High	Sample Time: <u>14:50</u>

Purging Information

Date: <u> </u> / <u> </u> / <u> </u>	Time Started: <u>14:25</u>	Time Completed: <u>15:00</u>
Method: Electric 12V DC Sampling Pump		
Water Level: <u>125.68</u>	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (µS/cm)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:40		7.21	0.492	4.31	4.81	14.7	210.5
14:43		7.20	0.491	3.17	4.86	14.7	209.5
14:46		7.21	0.491	2.55	4.85	14.8	208.0
14:49		7.20	0.42	2.34	4.82	14.8	208.0
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B,Ca,Cl,F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) <u>Clear</u> Sl.CLOUDY CLOUDY	Odor (circle one) <u>None</u> Strong Weak
---	---

Field Notes:

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / (NO) If yes, Sample ID _____
Sample No: MW-09	Weather CLR P.CLDY (CLDY) FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 49 °F Wind Calm (Mod) High	Personnel:
Sample Date: 12/4/23	Precip Rain Light Mod High Snow Light Mod High	Sample Time: 15:10

Purging Information

Date: ____/____/____	Time Started: 14:45	Time Completed: 15:20
Method: Electric 12V DC Sampling Pump		
Water Level: 115.10	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (mV)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	ORP (mV)
14:58		7.18	443.3	0.100	5.19	13.6	198.1
15:01		7.20	442.2	0.46	5.17	13.6	200.4
15:04		7.19	442.1	0.37	5.20	13.6	202.3
15:07		7.19	441.1	0.45	5.16	13.6	203.8
15:10							
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	-750 to 750

Sampling Information

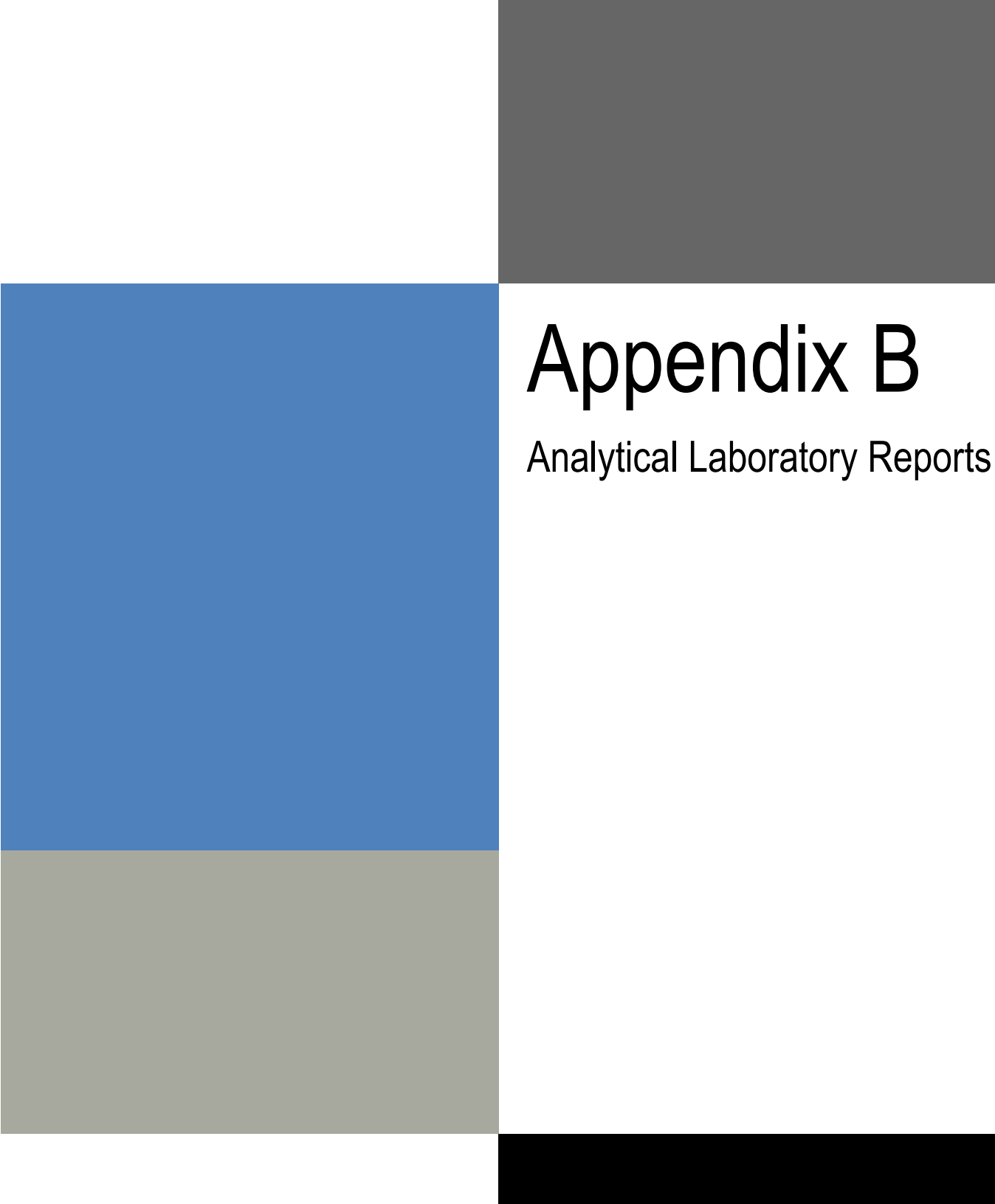
Sample Container	Preservative	Analysis Required	Method Number	Laboratory
1 x 250mL Poly	HNO ³	Metals	SW846	Test America
1 x 500mL Poly	None	B, Ca, Cl, F, TSS		Test America
3 x 1L Poly	None	Radium		Test America

Other Information

Appearance (circle one) (Clear) Sl. Cloudy Cloudy	Odor (circle one) (None) Strong Weak
---	--

Field Notes:

Quite a bit of air bubbles in line



Appendix B

Analytical Laboratory Reports

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Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Jenny Sidlo
Hastings Utilities
1228 North Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Generated 5/9/2023 5:52:44 PM

JOB DESCRIPTION

WEC MW Sampling

JOB NUMBER

310-254253-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Page 1 of 36



Eurofins Cedar Falls

Job Notes

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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.

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Page 2 of 36

5/9/2023

Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Sample Summary	5
Detection Summary	6
Client Sample Results	10
Definitions	20
QC Sample Results	21
QC Association	25
Chronicle	28
Certification Summary	32
Method Summary	33
Chain of Custody	34
Receipt Checklists	36



Case Narrative

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Job ID: 310-254253-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-254253-1

Receipt

The samples were received on 4/25/2023 8:30 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 -1.1°C

HPLC/IC

Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: MW-2B (310-254253-2), MW-3R (310-254253-3) and MW-4B (310-254253-4). 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

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

Job ID: 310-254253-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-254253-2

Receipt

The samples were received on 4/25/2023 8:30 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 -1.1°C

HPLC/IC

Method 9056A_ORGFM_48H: The following samples were received outside of holding time: MW-01 (310-254253-1), MW-2B (310-254253-2), MW-3R (310-254253-3), MW-4B (310-254253-4), MW-5B (310-254253-5), MW-06 (310-254253-6), MW-07 (310-254253-7), MW-08 (310-254253-8), MW-09 (310-254253-9) and EB-01 (310-254253-10).

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



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Job ID: 310-254253-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-254253-1	MW-01	Water	04/20/23 12:50	04/25/23 08:30
310-254253-2	MW-2B	Water	04/20/23 13:25	04/25/23 08:30
310-254253-3	MW-3R	Water	04/21/23 12:30	04/25/23 08:30
310-254253-4	MW-4B	Water	04/20/23 11:05	04/25/23 08:30
310-254253-5	MW-5B	Water	04/20/23 09:15	04/25/23 08:30
310-254253-6	MW-06	Water	04/20/23 10:20	04/25/23 08:30
310-254253-7	MW-07	Water	04/20/23 12:05	04/25/23 08:30
310-254253-8	MW-08	Water	04/20/23 13:55	04/25/23 08:30
310-254253-9	MW-09	Water	04/20/23 09:50	04/25/23 08:30
310-254253-10	EB-01	Water	04/21/23 11:30	04/25/23 08:30

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Job ID: 310-254253-1

Lab Sample ID: 310-254253-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	31.2		5.00	2.25	mg/L	5		9056A	Total/NA
Nitrate as N	10.6	H H3	1.00	0.390	mg/L	5		9056A	Total/NA
Fluoride	0.465	J	1.00	0.375	mg/L	5		9056A	Total/NA
Sulfate	161		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00430		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0833		0.00200	0.000640	mg/L	1		6020B	Total/NA
Boron	1.05		0.100	0.0760	mg/L	1		6020B	Total/NA
Calcium	35.8		0.500	0.190	mg/L	1		6020B	Total/NA
Chromium	0.0380		0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.000206	J	0.000500	0.000170	mg/L	1		6020B	Total/NA
Iron	0.0547	J	0.100	0.0360	mg/L	1		6020B	Total/NA
Lithium	0.0140		0.0100	0.00250	mg/L	1		6020B	Total/NA
Molybdenum	0.0350		0.00200	0.000910	mg/L	1		6020B	Total/NA
Selenium	0.0602		0.00500	0.00140	mg/L	1		6020B	Total/NA
Total Dissolved Solids	364		50.0	34.0	mg/L	1		SM 2540C	Total/NA

Lab Sample ID: 310-254253-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	28.4		5.00	2.25	mg/L	5		9056A	Total/NA
Nitrate as N	9.03	H H3	1.00	0.390	mg/L	5		9056A	Total/NA
Sulfate	136		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00205		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.182		0.00200	0.000640	mg/L	1		6020B	Total/NA
Boron	0.530		0.100	0.0760	mg/L	1		6020B	Total/NA
Calcium	81.1		0.500	0.190	mg/L	1		6020B	Total/NA
Chromium	0.0179		0.00500	0.00110	mg/L	1		6020B	Total/NA
Lithium	0.0162		0.0100	0.00250	mg/L	1		6020B	Total/NA
Molybdenum	0.00240		0.00200	0.000910	mg/L	1		6020B	Total/NA
Selenium	0.0369		0.00500	0.00140	mg/L	1		6020B	Total/NA
Total Dissolved Solids	424		50.0	34.0	mg/L	1		SM 2540C	Total/NA

Lab Sample ID: 310-254253-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	31.7		5.00	2.25	mg/L	5		9056A	Total/NA
Nitrate as N	6.73	H H3	1.00	0.390	mg/L	5		9056A	Total/NA
Sulfate	201		5.00	2.10	mg/L	5		9056A	Total/NA
Arsenic	0.00244		0.00200	0.000530	mg/L	1		6020B	Total/NA
Barium	0.0639		0.00200	0.000640	mg/L	1		6020B	Total/NA
Boron	0.674		0.100	0.0760	mg/L	1		6020B	Total/NA
Calcium	70.0		0.500	0.190	mg/L	1		6020B	Total/NA
Chromium	0.00480	J	0.00500	0.00110	mg/L	1		6020B	Total/NA
Lithium	0.0302		0.0100	0.00250	mg/L	1		6020B	Total/NA
Molybdenum	0.00527		0.00200	0.000910	mg/L	1		6020B	Total/NA
Selenium	0.0408		0.00500	0.00140	mg/L	1		6020B	Total/NA
Total Dissolved Solids	460		50.0	34.0	mg/L	1		SM 2540C	Total/NA

Lab Sample ID: 310-254253-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.8		5.00	2.25	mg/L	5		9056A	Total/NA

Eurofins Cedar Falls

Detection Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample ID: MW-4B (Continued)

Lab Sample ID: 310-254253-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Nitrate as N	5.29	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Sulfate	192		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00258		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0441		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.764		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	51.3		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.00731		0.00500	0.00110	mg/L	1			6020B	Total/NA
Cobalt	0.000236	J	0.000500	0.000170	mg/L	1			6020B	Total/NA
Iron	0.116		0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0322		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0104		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0273		0.00500	0.00140	mg/L	1			6020B	Total/NA
Nickel	0.00614		0.00500	0.00190	mg/L	1			6020B	Total/NA
Copper	0.00365	J	0.00500	0.00180	mg/L	1			6020B	Total/NA
Total Dissolved Solids	388		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-254253-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	24.7		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.8	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	1.16		1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	114		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00446		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0412		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	1.62		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	37.3		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0408		0.00500	0.00110	mg/L	1			6020B	Total/NA
Cobalt	0.000322	J	0.000500	0.000170	mg/L	1			6020B	Total/NA
Lithium	0.0123		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0640		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0597		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	322		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-06

Lab Sample ID: 310-254253-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	27.2		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	7.97	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.403	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	137		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00226		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0540		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.711		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	54.0		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0230		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0712	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0140		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0106		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.108		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	352		50.0	34.0	mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Detection Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample ID: MW-07

Lab Sample ID: 310-254253-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	28.9		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	7.86	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.630	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	153		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00351		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0312		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.942		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	44.7		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0166		0.00500	0.00110	mg/L	1			6020B	Total/NA
Lithium	0.0164		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0138		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0502		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	364		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-08

Lab Sample ID: 310-254253-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	26.2		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.7	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.949	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	140		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00448		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0471		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	1.19		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	35.2		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0384		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0531	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0120		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0336		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.107		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	326		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-09

Lab Sample ID: 310-254253-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	26.9		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	9.99	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.753	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	138		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00134	J	0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0657		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.468		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	35.7		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0600		0.00500	0.00110	mg/L	1			6020B	Total/NA
Lithium	0.00918	J	0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0143		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0266		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	306		50.0	34.0	mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

1234567891011121314

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Detection Summary

Client Sample ID: EB-01

Lab Sample ID: 310-254253-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	0.00827		0.00500	0.00110	mg/L	1		6020B	Total/NA
Cobalt	0.000591		0.000500	0.000170	mg/L	1		6020B	Total/NA
Iron	0.177		0.100	0.0360	mg/L	1		6020B	Total/NA
Molybdenum	0.00526		0.00200	0.000910	mg/L	1		6020B	Total/NA
Nickel	0.0276		0.00500	0.00190	mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

1234567891011121314

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample Results

Client Sample ID: MW-01

Lab Sample ID: 310-254253-1

Date Collected: 04/20/23 12:50

Date Received: 04/25/23 08:30

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31.2		5.00	2.25	mg/L			04/25/23 21:55	5
Nitrate as N	10.6	H H3	1.00	0.390	mg/L			04/25/23 21:55	5
Fluoride	0.465	J	1.00	0.375	mg/L			04/25/23 21:55	5
Sulfate	161		5.00	2.10	mg/L			05/01/23 22:17	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:17	1
Arsenic	0.00430		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:17	1
Barium	0.0833		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:17	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:17	1
Boron	1.05		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:17	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 16:54	1
Calcium	35.8		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:17	1
Chromium	0.0380		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:17	1
Cobalt	0.000206	J	0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:17	1
Iron	0.0547	J	0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:17	1
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:17	1
Lithium	0.0140		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:17	1
Molybdenum	0.0350		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:17	1
Selenium	0.0602		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:17	1
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:17	1
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:17	1
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:17	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:49	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	364		50.0	34.0	mg/L			04/25/23 14:22	1

Page 10 of 36

Eurofins Cedar Falls

5/9/2023

Client Sample ID: MW-2B
Date Collected: 04/20/23 13:25
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-2
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	28.4		5.00	2.25	mg/L			04/25/23 23:13	5	
Nitrate as N	9.03	H H3	1.00	0.390	mg/L			04/25/23 23:13	5	
Fluoride	<1.00		1.00	0.375	mg/L			04/25/23 23:13	5	
Sulfate	136		5.00	2.10	mg/L			05/01/23 22:31	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Arsenic	0.00205		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Barium	0.182		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Boron	0.530		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 16:57	1	
Calcium	81.1		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Chromium	0.0179		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Lithium	0.0162		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Molybdenum	0.00240		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Selenium	0.0369		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:35	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:35	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:51	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	424		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-3R
Date Collected: 04/21/23 12:30
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-3
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	31.7		5.00	2.25	mg/L			04/26/23 00:47	5	
Nitrate as N	6.73	H H3	1.00	0.390	mg/L			04/26/23 00:47	5	
Fluoride	<1.00		1.00	0.375	mg/L			04/26/23 00:47	5	
Sulfate	201		5.00	2.10	mg/L			05/01/23 22:45	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Arsenic	0.00244		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Barium	0.0639		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Boron	0.674		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 16:59	1	
Calcium	70.0		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Chromium	0.00480 J		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Lithium	0.0302		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Molybdenum	0.00527		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Selenium	0.0408		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:37	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:37	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:53	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	460		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-4B
Date Collected: 04/20/23 11:05
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-4
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	27.8		5.00	2.25	mg/L			04/25/23 23:29	5	
Nitrate as N	5.29	H H3	1.00	0.390	mg/L			04/25/23 23:29	5	
Fluoride	<1.00		1.00	0.375	mg/L			04/25/23 23:29	5	
Sulfate	192		5.00	2.10	mg/L			05/01/23 22:59	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Arsenic	0.00258		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Barium	0.0441		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Boron	0.764		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:01	1	
Calcium	51.3		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Chromium	0.00731		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Cobalt	0.000236	J	0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Iron	0.116		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Lithium	0.0322		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Molybdenum	0.0104		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Selenium	0.0273		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Nickel	0.00614		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:40	1	
Copper	0.00365	J	0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:40	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:55	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	388		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-5B
Date Collected: 04/20/23 09:15
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-5
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	24.7		5.00	2.25	mg/L			04/25/23 22:42	5	
Nitrate as N	10.8	H H3	1.00	0.390	mg/L			04/25/23 22:42	5	
Fluoride	1.16		1.00	0.375	mg/L			04/25/23 22:42	5	
Sulfate	114		5.00	2.10	mg/L			05/01/23 23:13	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Arsenic	0.00446		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Barium	0.0412		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Boron	1.62		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:04	1	
Calcium	37.3		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Chromium	0.0408		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Cobalt	0.000322	J	0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Lithium	0.0123		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Molybdenum	0.0640		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Selenium	0.0597		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:43	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:43	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:57	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	322		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-06
Date Collected: 04/20/23 10:20
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-6
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	27.2		5.00	2.25	mg/L			04/25/23 22:27	5	
Nitrate as N	7.97	H H3	1.00	0.390	mg/L			04/25/23 22:27	5	
Fluoride	0.403	J	1.00	0.375	mg/L			04/25/23 22:27	5	
Sulfate	137		5.00	2.10	mg/L			05/01/23 23:28	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Arsenic	0.00226		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Barium	0.0540		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Boron	0.711		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:29	1	
Calcium	54.0		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Chromium	0.0230		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Iron	0.0712	J	0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Lithium	0.0140		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Molybdenum	0.0106		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Selenium	0.108		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:46	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:46	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:59	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	352		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-07
Date Collected: 04/20/23 12:05
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-7
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	28.9		5.00	2.25	mg/L			04/25/23 22:11	5	
Nitrate as N	7.86	H H3	1.00	0.390	mg/L			04/25/23 22:11	5	
Fluoride	0.630	J	1.00	0.375	mg/L			04/25/23 22:11	5	
Sulfate	153		5.00	2.10	mg/L			05/02/23 00:11	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Arsenic	0.00351		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Barium	0.0312		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Boron	0.942		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:31	1	
Calcium	44.7		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Chromium	0.0166		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Lithium	0.0164		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Molybdenum	0.0138		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Selenium	0.0502		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:49	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:49	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 13:01	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	364		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-08
Date Collected: 04/20/23 13:55
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-8
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	26.2		5.00	2.25	mg/L			04/25/23 22:58	5	
Nitrate as N	10.7	H H3	1.00	0.390	mg/L			04/25/23 22:58	5	
Fluoride	0.949	J	1.00	0.375	mg/L			04/25/23 22:58	5	
Sulfate	140		5.00	2.10	mg/L			05/02/23 00:26	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Arsenic	0.00448		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Barium	0.0471		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Boron	1.19		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:34	1	
Calcium	35.2		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Chromium	0.0384		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Iron	0.0531	J	0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Lithium	0.0120		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Molybdenum	0.0336		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Selenium	0.107		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:52	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:52	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 13:08	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	326		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: MW-09
Date Collected: 04/20/23 09:50
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-9
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Chloride	26.9		5.00	2.25	mg/L			04/26/23 00:00	5	
Nitrate as N	9.99	H H3	1.00	0.390	mg/L			04/26/23 00:00	5	
Fluoride	0.753	J	1.00	0.375	mg/L			04/26/23 00:00	5	
Sulfate	138		5.00	2.10	mg/L			05/02/23 00:41	5	

Method: SW846 6020B - Metals (ICP/MS)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Arsenic	0.00134	J	0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Barium	0.0657		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Boron	0.468		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:36	1	
Calcium	35.7		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Chromium	0.0600		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Lithium	0.00918	J	0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Molybdenum	0.0143		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Selenium	0.0266		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:55	1	
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:55	1	

Method: SW846 7470A - Mercury (CVAA)										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 13:10	1	

General Chemistry										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Total Dissolved Solids (SM 2540C)	306		50.0	34.0	mg/L			04/25/23 14:22	1	

Client Sample ID: EB-01
Date Collected: 04/21/23 11:30
Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-10
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.450	mg/L			04/25/23 23:45	1
Nitrate as N	<0.200	H H3	0.200	0.0780	mg/L			04/25/23 23:45	1
Fluoride	<0.200		0.200	0.0750	mg/L			04/25/23 23:45	1
Sulfate	<1.00		1.00	0.420	mg/L			05/02/23 00:56	1

Method: SW846 6020B - Metals (ICP/MS)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 20:01	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 20:01	1
Barium	<0.00200		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 20:01	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 20:01	1
Boron	<0.100		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 20:01	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 17:41	1
Calcium	<0.500		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 20:01	1
Chromium	0.00827		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 20:01	1
Cobalt	0.000591		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 20:01	1
Iron	0.177		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 20:01	1
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 20:01	1
Lithium	<0.0100		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 20:01	1
Molybdenum	0.00526		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 20:01	1
Selenium	<0.00500		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 20:01	1
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 20:01	1
Nickel	0.0276		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 20:01	1
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 20:01	1

Method: SW846 7470A - Mercury (CVAA)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 13:12	1

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (SM 2540C)	<50.0		50.0	34.0	mg/L			04/26/23 12:49	1

Qualifiers

HPLC/IC	
Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
H3	Sample was received and analyzed past holding time.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals	
Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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 (Radiochemisry)
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 310-386151/3									
Matrix: Water									
Analysis Batch: 386151									
Client Sample ID: Method Blank									
Prep Type: Total/NA									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	<1.00		1.00	0.420	mg/L			05/01/23 20:10	1

Lab Sample ID: LCS 310-386151/4									
Matrix: Water									
Analysis Batch: 386151									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate	10.0	9.605		mg/L		96	90 - 110		

Lab Sample ID: MB 310-386155/3									
Matrix: Water									
Analysis Batch: 386155									
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	0.450	mg/L			04/25/23 19:35	1
Nitrate as N	<0.200		0.200	0.0780	mg/L			04/25/23 19:35	1
Fluoride	<0.200		0.200	0.0750	mg/L			04/25/23 19:35	1

Lab Sample ID: LCS 310-386155/4									
Matrix: Water									
Analysis Batch: 386155									
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	9.940		mg/L		99	90 - 110		
Nitrate as N	2.00	2.111		mg/L		106	90 - 110		
Fluoride	2.00	1.945		mg/L		97	90 - 110		

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-385480/1-A									
Matrix: Water									
Analysis Batch: 386531									
Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 385480									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		04/26/23 08:45	05/04/23 19:00	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		04/26/23 08:45	05/04/23 19:00	1
Barium	<0.00200		0.00200	0.000640	mg/L		04/26/23 08:45	05/04/23 19:00	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		04/26/23 08:45	05/04/23 19:00	1
Boron	<0.100		0.100	0.0760	mg/L		04/26/23 08:45	05/04/23 19:00	1
Calcium	<0.500		0.500	0.190	mg/L		04/26/23 08:45	05/04/23 19:00	1
Chromium	<0.00500		0.00500	0.00110	mg/L		04/26/23 08:45	05/04/23 19:00	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		04/26/23 08:45	05/04/23 19:00	1
Iron	<0.100		0.100	0.0360	mg/L		04/26/23 08:45	05/04/23 19:00	1
Lead	<0.000500		0.000500	0.000240	mg/L		04/26/23 08:45	05/04/23 19:00	1
Lithium	<0.0100		0.0100	0.00250	mg/L		04/26/23 08:45	05/04/23 19:00	1
Molybdenum	<0.00200		0.00200	0.000910	mg/L		04/26/23 08:45	05/04/23 19:00	1
Selenium	<0.00500		0.00500	0.00140	mg/L		04/26/23 08:45	05/04/23 19:00	1
Thallium	<0.00100		0.00100	0.000260	mg/L		04/26/23 08:45	05/04/23 19:00	1
Nickel	<0.00500		0.00500	0.00190	mg/L		04/26/23 08:45	05/04/23 19:00	1
Copper	<0.00500		0.00500	0.00180	mg/L		04/26/23 08:45	05/04/23 19:00	1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-385480/1-A									
Matrix: Water									
Analysis Batch: 386634									
Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 385480									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 16:30	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		04/26/23 08:45	05/05/23 16:30	1

Lab Sample ID: LCS 310-385480/2-A									
Matrix: Water									
Analysis Batch: 386531									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 385480									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Antimony	0.200	0.2057		mg/L		103	80 - 120		
Arsenic	0.200	0.2012		mg/L		101	80 - 120		
Barium	0.100	0.1033		mg/L		103	80 - 120		
Beryllium	0.100	0.1023		mg/L		102	80 - 120		
Boron	0.200	0.1991		mg/L		100	80 - 120		
Calcium	2.00	1.942		mg/L		97	80 - 120		
Chromium	0.100	0.1037		mg/L		104	80 - 120		
Cobalt	0.100	0.1045		mg/L		104	80 - 120		
Iron	0.200	0.2087		mg/L		104	80 - 120		
Lead	0.200	0.2036		mg/L		102	80 - 120		
Lithium	0.200	0.2107		mg/L		105	80 - 120		
Molybdenum	0.200	0.2114		mg/L		106	80 - 120		
Selenium	0.400	0.3902		mg/L		98	80 - 120		
Thallium	0.200	0.1600		mg/L		80	80 - 120		
Nickel	0.200	0.2142		mg/L		107	80 - 120		
Copper	0.200	0.2173		mg/L		109	80 - 120		

Lab Sample ID: LCS 310-385480/2-A									
Matrix: Water									
Analysis Batch: 386634									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 385480									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Cadmium	0.100	0.1011		mg/L		101	80 - 120		
Cadmium	0.100	0.1011		mg/L		101	80 - 120		

Lab Sample ID: 310-254253-9 DU									
Matrix: Water									
Analysis Batch: 386531									
Client Sample ID: MW-09									
Prep Type: Total/NA									
Prep Batch: 385480									
Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit	
Antimony	<0.00200		<0.00200		mg/L		NC	20	
Arsenic	0.00134	J	0.001275	J	mg/L		5	20	
Barium	0.0657		0.06276		mg/L		5	20	
Beryllium	<0.00100		<0.00100		mg/L		NC	20	
Boron	0.468		0.4294		mg/L		9	20	
Calcium	35.7		34.43		mg/L		4	20	
Chromium	0.0600		0.05724		mg/L		5	20	
Cobalt	<0.000500		<0.000500		mg/L		NC	20	
Iron	<0.100		<0.100		mg/L		NC	20	
Lead	<0.000500		<0.000500		mg/L		NC	20	
Lithium	0.00918	J	0.009226	J	mg/L		0.5	20	

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

Lab Sample ID: 310-254253-9 DU
Matrix: Water
Analysis Batch: 386531

Client Sample ID: MW-09
Prep Type: Total/NA
Prep Batch: 385480

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Molybdenum	0.0143		0.01344		mg/L		6	20
Selenium	0.0266		0.02552		mg/L		4	20
Thallium	<0.00100		<0.00100		mg/L		NC	20
Nickel	<0.00500		<0.00500		mg/L		NC	20
Copper	<0.00500		<0.00500		mg/L		NC	20

Lab Sample ID: 310-254253-9 DU
Matrix: Water
Analysis Batch: 386734

Client Sample ID: MW-09
Prep Type: Total/NA
Prep Batch: 385480

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Cadmium	<0.000200		<0.000200		mg/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-385586/1-A
Matrix: Water
Analysis Batch: 385740

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 385586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		04/26/23 13:17	04/27/23 12:21	1

Lab Sample ID: LCS 310-385586/2-A
Matrix: Water
Analysis Batch: 385740

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 385586

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00167	0.001648		mg/L		99	80 - 120

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

Lab Sample ID: MB 310-385440/1
Matrix: Water
Analysis Batch: 385440

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	34.0	mg/L			04/25/23 14:22	1

Lab Sample ID: LCS 310-385440/2
Matrix: Water
Analysis Batch: 385440

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	920.0		mg/L		92	90 - 110

Lab Sample ID: MB 310-385576/1
Matrix: Water
Analysis Batch: 385576

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	34.0	mg/L			04/26/23 12:49	1

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

Lab Sample ID: LCS 310-385576/2
Matrix: Water
Analysis Batch: 385576

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	930.0		mg/L		93	90 - 110

HPLC/IC

Analysis Batch: 386151

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	9056A	
310-254253-2	MW-2B	Total/NA	Water	9056A	
310-254253-3	MW-3R	Total/NA	Water	9056A	
310-254253-4	MW-4B	Total/NA	Water	9056A	
310-254253-5	MW-5B	Total/NA	Water	9056A	
310-254253-6	MW-06	Total/NA	Water	9056A	
310-254253-7	MW-07	Total/NA	Water	9056A	
310-254253-8	MW-08	Total/NA	Water	9056A	
310-254253-9	MW-09	Total/NA	Water	9056A	
310-254253-10	EB-01	Total/NA	Water	9056A	
MB 310-386151/3	Method Blank	Total/NA	Water	9056A	
LCS 310-386151/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 386155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	9056A	
310-254253-2	MW-2B	Total/NA	Water	9056A	
310-254253-3	MW-3R	Total/NA	Water	9056A	
310-254253-4	MW-4B	Total/NA	Water	9056A	
310-254253-5	MW-5B	Total/NA	Water	9056A	
310-254253-6	MW-06	Total/NA	Water	9056A	
310-254253-7	MW-07	Total/NA	Water	9056A	
310-254253-8	MW-08	Total/NA	Water	9056A	
310-254253-9	MW-09	Total/NA	Water	9056A	
310-254253-10	EB-01	Total/NA	Water	9056A	
MB 310-386155/3	Method Blank	Total/NA	Water	9056A	
LCS 310-386155/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 385480

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	3005A	
310-254253-2	MW-2B	Total/NA	Water	3005A	
310-254253-3	MW-3R	Total/NA	Water	3005A	
310-254253-4	MW-4B	Total/NA	Water	3005A	
310-254253-5	MW-5B	Total/NA	Water	3005A	
310-254253-6	MW-06	Total/NA	Water	3005A	
310-254253-7	MW-07	Total/NA	Water	3005A	
310-254253-8	MW-08	Total/NA	Water	3005A	
310-254253-9	MW-09	Total/NA	Water	3005A	
310-254253-10	EB-01	Total/NA	Water	3005A	
MB 310-385480/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-385480/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-254253-9 DU	MW-09	Total/NA	Water	3005A	

Prep Batch: 385586

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	7470A	
310-254253-2	MW-2B	Total/NA	Water	7470A	
310-254253-3	MW-3R	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 385586 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-4	MW-4B	Total/NA	Water	7470A	
310-254253-5	MW-5B	Total/NA	Water	7470A	
310-254253-6	MW-06	Total/NA	Water	7470A	
310-254253-7	MW-07	Total/NA	Water	7470A	
310-254253-8	MW-08	Total/NA	Water	7470A	
310-254253-9	MW-09	Total/NA	Water	7470A	
310-254253-10	EB-01	Total/NA	Water	7470A	
MB 310-385586/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-385586/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 385740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	7470A	385586
310-254253-2	MW-2B	Total/NA	Water	7470A	385586
310-254253-3	MW-3R	Total/NA	Water	7470A	385586
310-254253-4	MW-4B	Total/NA	Water	7470A	385586
310-254253-5	MW-5B	Total/NA	Water	7470A	385586
310-254253-6	MW-06	Total/NA	Water	7470A	385586
310-254253-7	MW-07	Total/NA	Water	7470A	385586
310-254253-8	MW-08	Total/NA	Water	7470A	385586
310-254253-9	MW-09	Total/NA	Water	7470A	385586
310-254253-10	EB-01	Total/NA	Water	7470A	385586
MB 310-385586/1-A	Method Blank	Total/NA	Water	7470A	385586
LCS 310-385586/2-A	Lab Control Sample	Total/NA	Water	7470A	385586

Analysis Batch: 386531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	6020B	385480
310-254253-2	MW-2B	Total/NA	Water	6020B	385480
310-254253-3	MW-3R	Total/NA	Water	6020B	385480
310-254253-4	MW-4B	Total/NA	Water	6020B	385480
310-254253-5	MW-5B	Total/NA	Water	6020B	385480
310-254253-6	MW-06	Total/NA	Water	6020B	385480
310-254253-7	MW-07	Total/NA	Water	6020B	385480
310-254253-8	MW-08	Total/NA	Water	6020B	385480
310-254253-9	MW-09	Total/NA	Water	6020B	385480
310-254253-10	EB-01	Total/NA	Water	6020B	385480
MB 310-385480/1-A	Method Blank	Total/NA	Water	6020B	385480
LCS 310-385480/2-A	Lab Control Sample	Total/NA	Water	6020B	385480
310-254253-9 DU	MW-09	Total/NA	Water	6020B	385480

Analysis Batch: 386634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	6020B	385480
310-254253-2	MW-2B	Total/NA	Water	6020B	385480
310-254253-3	MW-3R	Total/NA	Water	6020B	385480
310-254253-4	MW-4B	Total/NA	Water	6020B	385480
310-254253-5	MW-5B	Total/NA	Water	6020B	385480
MB 310-385480/1-A	Method Blank	Total/NA	Water	6020B	385480
LCS 310-385480/2-A	Lab Control Sample	Total/NA	Water	6020B	385480

Metals

Analysis Batch: 386734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-6	MW-06	Total/NA	Water	6020B	385480
310-254253-7	MW-07	Total/NA	Water	6020B	385480
310-254253-8	MW-08	Total/NA	Water	6020B	385480
310-254253-9	MW-09	Total/NA	Water	6020B	385480
310-254253-10	EB-01	Total/NA	Water	6020B	385480
MB 310-385480/1-A	Method Blank	Total/NA	Water	6020B	385480
LCS 310-385480/2-A	Lab Control Sample	Total/NA	Water	6020B	385480
310-254253-9 DU	MW-09	Total/NA	Water	6020B	385480

General Chemistry

Analysis Batch: 385440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-1	MW-01	Total/NA	Water	SM 2540C	
310-254253-2	MW-2B	Total/NA	Water	SM 2540C	
310-254253-3	MW-3R	Total/NA	Water	SM 2540C	
310-254253-4	MW-4B	Total/NA	Water	SM 2540C	
310-254253-5	MW-5B	Total/NA	Water	SM 2540C	
310-254253-6	MW-06	Total/NA	Water	SM 2540C	
310-254253-7	MW-07	Total/NA	Water	SM 2540C	
310-254253-8	MW-08	Total/NA	Water	SM 2540C	
310-254253-9	MW-09	Total/NA	Water	SM 2540C	
MB 310-385440/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-385440/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 385576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-254253-10	EB-01	Total/NA	Water	SM 2540C	
MB 310-385576/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-385576/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Client Sample ID: MW-01

Date Collected: 04/20/23 12:50

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 22:17
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 21:55
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:17
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386634	DHM5	EET CF	05/05/23 16:54
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:49
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-2B

Date Collected: 04/20/23 13:25

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 22:31
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 23:13
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:35
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386634	DHM5	EET CF	05/05/23 16:57
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:51
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-3R

Date Collected: 04/21/23 12:30

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 22:45
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/26/23 00:47
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:37
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386634	DHM5	EET CF	05/05/23 16:59
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:53
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample ID: MW-4B

Date Collected: 04/20/23 11:05

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 22:59
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 23:29
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:40
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386634	DHM5	EET CF	05/05/23 17:01
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:55
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-5B

Date Collected: 04/20/23 09:15

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 23:13
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 22:42
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:43
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386634	DHM5	EET CF	05/05/23 17:04
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:57
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-06

Date Collected: 04/20/23 10:20

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/01/23 23:28
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 22:27
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:46
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386734	ZRI4	EET CF	05/05/23 17:29
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 12:59
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Eurofins Cedar Falls

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample ID: MW-07

Date Collected: 04/20/23 12:05

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-7

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/02/23 00:11
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 22:11
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:49
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386734	ZRI4	EET CF	05/05/23 17:31
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 13:01
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-08

Date Collected: 04/20/23 13:55

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-8

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/02/23 00:26
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/25/23 22:58
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:52
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386734	ZRI4	EET CF	05/05/23 17:34
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 13:08
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Client Sample ID: MW-09

Date Collected: 04/20/23 09:50

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-9

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	386151	QTZ5	EET CF	05/02/23 00:41
Total/NA	Analysis	9056A		5	386155	QTZ5	EET CF	04/26/23 00:00
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 19:55
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386734	ZRI4	EET CF	05/05/23 17:36
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 13:10
Total/NA	Analysis	SM 2540C		1	385440	ENB7	EET CF	04/25/23 14:22

Eurofins Cedar Falls

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Client Sample ID: EB-01

Date Collected: 04/21/23 11:30

Date Received: 04/25/23 08:30

Lab Sample ID: 310-254253-10

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	386151	QTZ5	EET CF	05/02/23 00:56
Total/NA	Analysis	9056A		1	386155	QTZ5	EET CF	04/25/23 23:45
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386531	DHM5	EET CF	05/04/23 20:01
Total/NA	Prep	3005A			385480	DHM5	EET CF	04/26/23 08:45
Total/NA	Analysis	6020B		1	386734	ZRI4	EET CF	05/05/23 17:41
Total/NA	Prep	7470A			385586	XXW3	EET CF	04/26/23 13:17
Total/NA	Analysis	7470A		1	385740	XXW3	EET CF	04/27/23 13:12
Total/NA	Analysis	SM 2540C		1	385576	ENB7	EET CF	04/26/23 12:49

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

Accreditation/Certification Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	IA1000031	09-29-23

Method Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-254253-1

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
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF

Protocol References:

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.

Laboratory References:

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

Eurofins Cedar Falls



Environment Testing
America



310-254253 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>DPGA</u>			
City/State:	CITY <u>Hastings</u>	STATE <u>NE</u>	Project:
Receipt Information			
Date/Time Received:	DATE <u>4/25/23</u>	TIME <u>0830</u>	Received By: <u>JJ</u>
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? ☐ Yes ☒ No If yes: Cooler custody seals intact? ☐ Yes ☐ No			
Sample Custody Seals Present? ☐ 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: <u>W</u>		Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>-1.1</u>		Corrected Temp (°C): <u>-1.1</u>	
• 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			

Document CED-P-SAM-FRM45521
Revision 25
Date 27 Jan 2022

Eurofins Cedar Falls
Page 34 of 36

General temperature criteria is 0 to 6°C
Bacteria temperature criteria is 0 to 10°C

ANALYTICAL REPORT

PREPARED FOR

Attn: Jenny Sidlo
Hastings Utilities
1228 North Denver Ave
PO BOX 289
Hastings, Nebraska 68901
Generated 5/31/2023 3:14:04 PM

JOB DESCRIPTION

WEC MW Sampling - Ash Pond

JOB NUMBER

160-49838-1

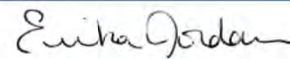
Eurofins St. Louis

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 TestAmerica Project Manager.

Authorization



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5/31/2023 3:14:04 PM

Authorized for release by
Erika Jordan, Project Manager
erika.jordan@et.eurofinsus.com
(314)298-8566

Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Chain of Custody	5
Receipt Checklists	6
Definitions/Glossary	7
Method Summary	8
Sample Summary	9
Client Sample Results	10
QC Sample Results	16
QC Association Summary	17
Tracer Carrier Summary	18

Case Narrative

Client: Hastings Utilities
Project/Site: WEC MW Sampling - Ash Pond

Job ID: 160-49838-1

Job ID: 160-49838-1

Laboratory: Eurofins St. Louis

Narrative

Job Narrative
160-49838-1

Receipt

The samples were received on 5/1/2023 11:30 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 13.8° C.

RAD

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Radium-226 batch 610363

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

Radium-228 prep batch 160-610365

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

THE LEADER IN ENVIRONMENTAL TESTING

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Client: Hastings Utilities

Job Number: 160-49838-1
SDG Number:

List Source: Eurofins St. Louis

Login Number: 49838
List Number: 1
Creator: Awalt, Jayna K

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Hastings Utilities
Project/Site: WEC MW Sampling - Ash Pond

Job ID: 160-49838-1

Qualifiers

Rad

Qualifier	Qualifier Description
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 Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling - Ash Pond

Job ID: 160-49838-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency
None = None
TAL-STL = TestAmerica Laboratories, St. Louis, Facility Standard Operating Procedure.

Laboratory References:

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

Eurofins St. Louis

Eurofins St. Louis

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-49838-1	MW-01	Water	04/20/23 12:50	05/01/23 11:30
160-49838-2	MW-2B	Water	04/20/23 13:25	05/01/23 11:30
160-49838-3	MW-3R	Water	04/20/23 12:30	05/01/23 11:30
160-49838-4	MW-4B	Water	04/20/23 11:05	05/01/23 11:30
160-49838-5	MW-5B	Water	04/20/23 09:15	05/01/23 11:30
160-49838-6	MW-06	Water	04/20/23 10:20	05/01/23 11:30
160-49838-7	MW-07	Water	04/20/23 12:05	05/01/23 11:30
160-49838-8	MW-08	Water	04/20/23 13:55	05/01/23 11:30
160-49838-9	MW-09	Water	04/20/23 09:50	05/01/23 11:30

Client Sample ID: MW-01
Date Collected: 04/20/23 12:50
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-1
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.111	U	0.0956	0.0961	1.00	0.144	pCi/L	05/05/23 09:54	05/30/23 16:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		30 - 110					05/05/23 09:54	05/30/23 16:49	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.719		0.349	0.355	1.00	0.457	pCi/L	05/05/23 10:18	05/25/23 12:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		30 - 110					05/05/23 10:18	05/25/23 12:09	1
Y Carrier	82.2		30 - 110					05/05/23 10:18	05/25/23 12:09	1

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	0.830		0.362	0.368	5.00	0.457	pCi/L		05/30/23 17:08	1	

Client Sample ID: MW-2B
Date Collected: 04/20/23 13:25
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-2
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil	Fac
Radium-226	0.173		0.114	0.115	1.00	0.162	pCi/L	05/05/23 09:54	05/30/23 16:49	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil	Fac
Ba Carrier	93.2		30 - 110					05/05/23 09:54	05/30/23 16:49	1	
Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil	Fac
Radium-228	0.293	U	0.267	0.269	1.00	0.419	pCi/L	05/05/23 10:18	05/25/23 12:09	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil	Fac
Ba Carrier	93.2		30 - 110					05/05/23 10:18	05/25/23 12:09	1	
Y Carrier	84.9		30 - 110					05/05/23 10:18	05/25/23 12:09	1	

Client Sample ID: MW-2B
Date Collected: 04/20/23 13:25
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-2
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	0.466		0.290	0.293	5.00	0.419	pCi/L		05/30/23 17:08	1

Client Sample ID: MW-3R
Date Collected: 04/20/23 12:30
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-3
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)										
			Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)						
Analyte	Result	Qualifier			RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.166		0.115	0.116	1.00	0.160	pCi/L	05/05/23 09:54	05/30/23 16:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	74.2		30 - 110					05/05/23 09:54	05/30/23 16:49	1

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.429	U	0.414	0.416	1.00	0.663	pCi/L	05/05/23 10:18	05/25/23 12:09	1	
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	74.2		30 - 110						05/05/23 10:18	05/25/23 12:09	1
Y Carrier	84.1		30 - 110						05/05/23 10:18	05/25/23 12:09	1

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	0.595	U	0.430	0.432	5.00	0.663	pCi/L		05/30/23 17:08	1

Client Sample ID: MW-4B
Date Collected: 04/20/23 11:05
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-4
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0322	U	0.0584	0.0585	1.00	0.105	pCi/L	05/05/23 09:54	05/30/23 18:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110					05/05/23 09:54	05/30/23 18:11	1

Client Sample ID: MW-4B
Date Collected: 04/20/23 11:05
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-4
Matrix: Water

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.663		0.361	0.366	1.00	0.501	pCi/L	05/05/23 10:18	05/25/23 12:10	1	
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	90.3		30 - 110						05/05/23 10:18	05/25/23 12:10	1
Y Carrier	78.9		30 - 110						05/05/23 10:18	05/25/23 12:10	1

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	0.696		0.366	0.371	5.00	0.501	pCi/L		05/30/23 17:08	1

Client Sample ID: MW-5B
Date Collected: 04/20/23 09:15
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-5
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0597	U	0.0755	0.0757	1.00	0.125	pCi/L	05/05/23 09:54	05/30/23 22:23	1
Carrier	%Yield	Qualifier	Limits				Prepared		Analyzed	Dil Fac
Ba Carrier	98.8		30 - 110				05/05/23 09:54		05/30/23 22:23	1

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	-0.151	U	0.234	0.234	1.00	0.485	pCi/L	05/05/23 10:18	05/25/23 12:10	1	
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed	Dil Fac
Ba Carrier	98.8		30 - 110						05/05/23 10:18	05/25/23 12:10	1
Y Carrier	83.4		30 - 110						05/05/23 10:18	05/25/23 12:10	1

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	-0.0911	U	0.246	0.246	5.00	0.485	pCi/L		05/30/23 17:08	1

Client Sample ID: MW-06
Date Collected: 04/20/23 10:20
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-6
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-226	0.338		0.192	0.194	1.00	0.261	pCi/L	05/05/23 09:54	05/30/23 18:11	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	52.3		30 - 110					05/05/23 09:54	05/30/23 18:11	1	

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.635	U	0.570	0.573	1.00	0.902	pCi/L	05/05/23 10:18	05/25/23 12:10	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	52.3		30 - 110					05/05/23 10:18	05/25/23 12:10	1	
Y Carrier	84.5		30 - 110					05/05/23 10:18	05/25/23 12:10	1	

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	0.972		0.601	0.605	5.00	0.902	pCi/L		05/30/23 17:08	1	

Client Sample ID: MW-07
Date Collected: 04/20/23 12:05
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-7
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-226	0.0884	U	0.0848	0.0852	1.00	0.132	pCi/L	05/05/23 09:54	05/30/23 22:24	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	95.4		30 - 110					05/05/23 09:54	05/30/23 22:24	1	

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.699		0.354	0.360	1.00	0.487	pCi/L	05/05/23 10:18	05/25/23 12:10	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	95.4		30 - 110					05/05/23 10:18	05/25/23 12:10	1	
Y Carrier	83.0		30 - 110					05/05/23 10:18	05/25/23 12:10	1	

Client Sample ID: MW-07
Date Collected: 04/20/23 12:05
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-7
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	0.787		0.364	0.370	5.00	0.487	pCi/L		05/30/23 17:08	1	

Client Sample ID: MW-08
Date Collected: 04/20/23 13:55
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-8
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-226	0.0892	U	0.0819	0.0823	1.00	0.122	pCi/L	05/05/23 09:54	05/30/23 18:13	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	77.9		30 - 110					05/05/23 09:54	05/30/23 18:13	1	

Method: EPA 904.0 - Radium-228 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-228	0.392	U	0.374	0.376	1.00	0.596	pCi/L	05/05/23 10:18	05/25/23 12:10	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	77.9		30 - 110					05/05/23 10:18	05/25/23 12:10	1	
Y Carrier	84.1		30 - 110					05/05/23 10:18	05/25/23 12:10	1	

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	0.481	U	0.383	0.385	5.00	0.596	pCi/L		05/30/23 17:08	1	

Client Sample ID: MW-09
Date Collected: 04/20/23 09:50
Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-9
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)											
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac	
Radium-226	0.170		0.0956	0.0968	1.00	0.122	pCi/L	05/05/23 09:54	05/30/23 18:13	1	
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac	
Ba Carrier	98.3		30 - 110					05/05/23 09:54	05/30/23 18:13	1	

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling - Ash Pond

Job ID: 160-49838-1

Client Sample ID: MW-09

Date Collected: 04/20/23 09:50

Date Received: 05/01/23 11:30

Lab Sample ID: 160-49838-9

Matrix: Water

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.130	U	0.256	0.256	1.00	0.445	pCi/L	05/05/23 10:18	05/25/23 12:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		30 - 110					05/05/23 10:18	05/25/23 12:10	1
Y Carrier	86.7		30 - 110					05/05/23 10:18	05/25/23 12:10	1

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	0.301	U	0.273	0.274	5.00	0.445	pCi/L		05/30/23 17:08	1

QC Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling - Ash Pond

Job ID: 160-49838-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-610363/1-A

Matrix: Water

Analysis Batch: 613641

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 610363

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.04336	U	0.0519	0.0520	1.00	0.132	pCi/L	05/05/23 09:54	05/30/23 16:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.1		30 - 110					05/05/23 09:54	05/30/23 16:45	1

Lab Sample ID: LCS 160-610363/2-A

Matrix: Water

Analysis Batch: 613641

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 610363

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.22		1.09	1.00	0.123	pCi/L	90	75 - 113
Carrier	%Yield	LCS Qualifier	Limits						
Ba Carrier	101		30 - 110						

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-610365/1-A

Matrix: Water

Analysis Batch: 613104

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 610365

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3495	U	0.330	0.331	1.00	0.527	pCi/L	05/05/23 10:18	05/25/23 12:05	1
Carrier	%Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.1		30 - 110					05/05/23 10:18	05/25/23 12:05	1
Y Carrier	82.6		30 - 110					05/05/23 10:18	05/25/23 12:05	1

Lab Sample ID: LCS 160-610365/2-A

Matrix: Water

Analysis Batch: 613104

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 610365

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	8.17	8.535		1.15	1.00	0.420	pCi/L	104	75 - 125
Carrier	%Yield	LCS Qualifier	Limits						
Ba Carrier	101		30 - 110						
Y Carrier	82.6		30 - 110						

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Rad

Prep Batch: 610363

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-49838-1	MW-01	Total/NA	Water	PrecSep-21	
160-49838-2	MW-2B	Total/NA	Water	PrecSep-21	
160-49838-3	MW-3R	Total/NA	Water	PrecSep-21	
160-49838-4	MW-4B	Total/NA	Water	PrecSep-21	
160-49838-5	MW-5B	Total/NA	Water	PrecSep-21	
160-49838-6	MW-06	Total/NA	Water	PrecSep-21	
160-49838-7	MW-07	Total/NA	Water	PrecSep-21	
160-49838-8	MW-08	Total/NA	Water	PrecSep-21	
160-49838-9	MW-09	Total/NA	Water	PrecSep-21	
MB 160-610363/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-610363/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 610365

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-49838-1	MW-01	Total/NA	Water	PrecSep_0	
160-49838-2	MW-2B	Total/NA	Water	PrecSep_0	
160-49838-3	MW-3R	Total/NA	Water	PrecSep_0	
160-49838-4	MW-4B	Total/NA	Water	PrecSep_0	
160-49838-5	MW-5B	Total/NA	Water	PrecSep_0	
160-49838-6	MW-06	Total/NA	Water	PrecSep_0	
160-49838-7	MW-07	Total/NA	Water	PrecSep_0	
160-49838-8	MW-08	Total/NA	Water	PrecSep_0	
160-49838-9	MW-09	Total/NA	Water	PrecSep_0	
MB 160-610365/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-610365/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)			
Lab Sample ID	Client Sample ID	Ba (30-110)			
160-49838-1	MW-01	85.9			
160-49838-2	MW-2B	93.2			
160-49838-3	MW-3R	74.2			
160-49838-4	MW-4B	90.3			
160-49838-5	MW-5B	98.8			
160-49838-6	MW-06	52.3			
160-49838-7	MW-07	95.4			
160-49838-8	MW-08	77.9			
160-49838-9	MW-09	98.3			
LCS 160-610363/2-A	Lab Control Sample	101			
MB 160-610363/1-A	Method Blank	96.1			
Tracer/Carrier Legend					
Ba = Ba Carrier					

Method: 904.0 - 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)		
160-49838-1	MW-01	85.9	82.2		
160-49838-2	MW-2B	93.2	84.9		
160-49838-3	MW-3R	74.2	84.1		
160-49838-4	MW-4B	90.3	78.9		
160-49838-5	MW-5B	98.8	83.4		
160-49838-6	MW-06	52.3	84.5		
160-49838-7	MW-07	95.4	83.0		
160-49838-8	MW-08	77.9	84.1		
160-49838-9	MW-09	98.3	86.7		
LCS 160-610365/2-A	Lab Control Sample	101	82.6		
MB 160-610365/1-A	Method Blank	96.1	82.6		
Tracer/Carrier Legend					
Ba = Ba Carrier					
Y = Y Carrier					

ANALYTICAL REPORT

PREPARED FOR

Attn: Jenny Sidlo
Hastings Utilities
1228 North Denver Ave
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Hastings, Nebraska 68901
Generated 12/18/2023 1:28:49 PM

JOB DESCRIPTION

WEC MW Sampling
CCR Network Wells

JOB NUMBER

310-271001-1

Eurofins Cedar Falls

Job Notes

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Authorization



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Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Sample Summary	5
Detection Summary	6
Client Sample Results	10
Definitions	20
QC Sample Results	21
QC Association	24
Chronicle	27
Certification Summary	30
Method Summary	31
Chain of Custody	32
Receipt Checklists	34

Case Narrative

Client: Hastings Utilities
Project: WEC MW Sampling

Job ID: 310-271001-1

Job ID: 310-271001-1

Eurofins Cedar Falls

Job Narrative 310-271001-1

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 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 12/7/2023 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 0.3°C.

HPLC/IC

Method 9056A_ORGFM_28D: The following samples were diluted due to the nature of the sample matrix: MW-01 (310-271001-1), MW-2B (310-271001-2) and MW-4B (310-271001-4). Elevated reporting limits (RLs) are provided.

Method 9056A_ORGFM_48H: The following samples were received outside of holding time: MW-4B (310-271001-4), MW-5B (310-271001-5), MW-06 (310-271001-6), MW-09 (310-271001-9) and FB-01 (310-271001-10).

Method 9056A_ORGFM_48H: The following sample(s) was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-10B (310-271001-3) and MW-07 (310-271001-7).

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 1_3765_85: The following samples were received outside of holding time: MW-01 (310-271001-1), MW-2B (310-271001-2), MW-10B (310-271001-3), MW-4B (310-271001-4), MW-5B (310-271001-5), MW-06 (310-271001-6), MW-07 (310-271001-7), MW-08 (310-271001-8), MW-09 (310-271001-9) and FB-01 (310-271001-10).

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

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Sample Summary

Job ID: 310-271001-1
SDG: CCR Network Walls

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-271001-1	MW-01	Water	12/05/23 13:15	12/07/23 09:40
310-271001-2	MW-2B	Water	12/05/23 14:00	12/07/23 09:40
310-271001-3	MW-10B	Water	12/05/23 11:30	12/07/23 09:40
310-271001-4	MW-4B	Water	12/05/23 09:40	12/07/23 09:40
310-271001-5	MW-5B	Water	12/04/23 14:10	12/07/23 09:40
310-271001-6	MW-06	Water	12/04/23 15:55	12/07/23 09:40
310-271001-7	MW-07	Water	12/05/23 10:35	12/07/23 09:40
310-271001-8	MW-08	Water	12/05/23 14:25	12/07/23 09:40
310-271001-9	MW-09	Water	12/04/23 15:10	12/07/23 09:40
310-271001-10	FB-01	Water	12/05/23 09:00	12/07/23 09:40

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-271001-1
SDG: CCR Network Walls

Client Sample ID: MW-01

Lab Sample ID: 310-271001-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	29.0		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.4		1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.447	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	150		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00449		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0718		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.936		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	31.0		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0331		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0769	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0102		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0222		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0413		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	322		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-2B

Lab Sample ID: 310-271001-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	29.7		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	9.43		1.00	0.390	mg/L	5			9056A	Total/NA
Sulfate	146		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00225		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.176		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.585		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	79.1		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0178		0.00500	0.00110	mg/L	1			6020B	Total/NA
Lithium	0.0156		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.00242		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0372		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	2.00	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	422		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-10B

Lab Sample ID: 310-271001-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	30.4		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	11.1	H	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.785	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	172		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00379		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0496		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.906		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	42.2		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0337		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0590	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0114		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0258		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0609		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	4.33	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	348		50.0	34.0	mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-4B

Lab Sample ID: 310-271001-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	28.2		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	7.13	H	1.00	0.390	mg/L	5			9056A	Total/NA
Sulfate	177		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00258		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0444		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.657		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	48.4		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0122		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0950	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0264		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0110		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0638		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	5.00	H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	352		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-5B

Lab Sample ID: 310-271001-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	24.4		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.1	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	1.28		1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	78.7		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00513		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0422		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	1.22		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	25.5		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0227		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0612	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0110		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0560		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0505		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	3.00	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	254		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-06

Lab Sample ID: 310-271001-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	30.3		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	7.92	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.400	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	151		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00281		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0491		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.705		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	55.0		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0169		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.123		0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0131		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0108		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0663		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	4.33	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	368		50.0	34.0	mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Detection Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-07

Lab Sample ID: 310-271001-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	30.3		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	9.11	H	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.649	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	172		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00295		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0347		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.813		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	48.1		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0164		0.00500	0.00110	mg/L	1			6020B	Total/NA
Lithium	0.0149		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0146		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0540		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	2.33	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	364		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-08

Lab Sample ID: 310-271001-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	29.5		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.8		1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	0.782	J	1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	165		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00371		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0484		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	0.916		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	42.1		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0330		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0605	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.0117		0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0252		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0602		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Suspended Solids	3.67	J H	5.00	1.70	mg/L	1			I-3765-85	Total/NA
Total Dissolved Solids	344		50.0	34.0	mg/L	1			SM 2540C	Total/NA

Client Sample ID: MW-09

Lab Sample ID: 310-271001-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Chloride	27.0		5.00	2.25	mg/L	5			9056A	Total/NA
Nitrate as N	10.8	H H3	1.00	0.390	mg/L	5			9056A	Total/NA
Fluoride	1.39		1.00	0.375	mg/L	5			9056A	Total/NA
Sulfate	99.1		5.00	2.10	mg/L	5			9056A	Total/NA
Arsenic	0.00246		0.00200	0.000530	mg/L	1			6020B	Total/NA
Barium	0.0532		0.00200	0.000640	mg/L	1			6020B	Total/NA
Boron	1.40		0.100	0.0760	mg/L	1			6020B	Total/NA
Calcium	25.8		0.500	0.190	mg/L	1			6020B	Total/NA
Chromium	0.0575		0.00500	0.00110	mg/L	1			6020B	Total/NA
Iron	0.0453	J	0.100	0.0360	mg/L	1			6020B	Total/NA
Lithium	0.00982	J	0.0100	0.00250	mg/L	1			6020B	Total/NA
Molybdenum	0.0301		0.00200	0.000910	mg/L	1			6020B	Total/NA
Selenium	0.0680		0.00500	0.00140	mg/L	1			6020B	Total/NA
Total Dissolved Solids	230		50.0	34.0	mg/L	1			SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: FB-01

Lab Sample ID: 310-271001-10

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Cedar Falls

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-01

Lab Sample ID: 310-271001-1

Date Collected: 12/05/23 13:15

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.0		5.00	2.25	mg/L			12/07/23 12:36	5
Nitrate as N	10.4		1.00	0.390	mg/L			12/07/23 12:36	5
Fluoride	0.447	J	1.00	0.375	mg/L			12/07/23 12:36	5
Sulfate	150		5.00	2.10	mg/L			12/07/23 12:36	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 14:32	1
Arsenic	0.00449		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 14:32	1
Barium	0.0718		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 14:32	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 14:32	1
Boron	0.936		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 14:32	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 14:32	1
Calcium	31.0		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 14:32	1
Chromium	0.0331		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 14:32	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 14:32	1
Iron	0.0769	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 14:32	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 14:32	1
Lithium	0.0102		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 14:32	1
Molybdenum	0.0222		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 14:32	1
Selenium	0.0413		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 14:32	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 14:32	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	<5.00	H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	322		50.0	34.0	mg/L			12/08/23 17:15	1

Eurofins Cedar Falls

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-2B

Lab Sample ID: 310-271001-2

Date Collected: 12/05/23 14:00

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.7		5.00	2.25	mg/L			12/07/23 13:12	5
Nitrate as N	9.43		1.00	0.390	mg/L			12/07/23 13:12	5
Fluoride	<1.00		1.00	0.375	mg/L			12/07/23 13:12	5
Sulfate	146		5.00	2.10	mg/L			12/07/23 13:12	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 14:35	1
Arsenic	0.00225		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 14:35	1
Barium	0.176		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 14:35	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 14:35	1
Boron	0.585		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 14:35	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 14:35	1
Calcium	79.1		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 14:35	1
Chromium	0.0178		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 14:35	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 14:35	1
Iron	<0.100		0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 14:35	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 14:35	1
Lithium	0.0156		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 14:35	1
Molybdenum	0.00242		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 14:35	1
Selenium	0.0372		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 14:35	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 14:35	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:42	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	2.00	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	422		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-108

Lab Sample ID: 310-271001-3

Date Collected: 12/05/23 11:30

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30.4		5.00	2.25	mg/L			12/07/23 13:24	5
Nitrate as N	11.1	H	1.00	0.390	mg/L			12/07/23 13:24	5
Fluoride	0.785	J	1.00	0.375	mg/L			12/07/23 13:24	5
Sulfate	172		5.00	2.10	mg/L			12/07/23 13:24	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:11	1
Arsenic	0.00379		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:11	1
Barium	0.0496		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:11	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:11	1
Boron	0.906		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:11	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:11	1
Calcium	42.2		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:11	1
Chromium	0.0337		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:11	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:11	1
Iron	0.0590	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:11	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:11	1
Lithium	0.0114		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:11	1
Molybdenum	0.0256		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:11	1
Selenium	0.0609		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:11	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:11	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	4.33	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	346		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-4B

Lab Sample ID: 310-271001-4

Date Collected: 12/05/23 09:40

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	28.2		5.00	2.25	mg/L			12/07/23 13:36	5
Nitrate as N	7.13	H	1.00	0.390	mg/L			12/07/23 13:36	5
Fluoride	<1.00		1.00	0.375	mg/L			12/07/23 13:36	5
Sulfate	177		5.00	2.10	mg/L			12/07/23 13:36	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:14	1
Arsenic	0.00258		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:14	1
Barium	0.0444		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:14	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:14	1
Boron	0.657		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:14	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:14	1
Calcium	48.4		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:14	1
Chromium	0.0122		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:14	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:14	1
Iron	0.0950	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:14	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:14	1
Lithium	0.0264		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:14	1
Molybdenum	0.0110		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:14	1
Selenium	0.0638		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:14	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:14	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	5.00	H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	352		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-5B

Lab Sample ID: 310-271001-5

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	24.4		5.00	2.25	mg/L			12/07/23 13:48	5
Nitrate as N	10.1	H H3	1.00	0.390	mg/L			12/07/23 13:48	5
Fluoride	1.28		1.00	0.375	mg/L			12/07/23 13:48	5
Sulfate	78.7		5.00	2.10	mg/L			12/07/23 13:48	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:17	1
Arsenic	0.00513		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:17	1
Barium	0.0422		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:17	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:17	1
Boron	1.22		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:17	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:17	1
Calcium	25.5		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:17	1
Chromium	0.0227		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:17	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:17	1
Iron	0.0612	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:17	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:17	1
Lithium	0.0110		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:17	1
Molybdenum	0.0560		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:17	1
Selenium	0.0505		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:17	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:17	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	3.00	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	254		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-06

Lab Sample ID: 310-271001-6

Date Collected: 12/04/23 15:55

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30.3		5.00	2.25	mg/L			12/07/23 14:01	5
Nitrate as N	7.92	H H3	1.00	0.390	mg/L			12/07/23 14:01	5
Fluoride	0.400	J	1.00	0.375	mg/L			12/07/23 14:01	5
Sulfate	151		5.00	2.10	mg/L			12/07/23 14:01	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:20	1
Arsenic	0.00281		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:20	1
Barium	0.0491		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:20	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:20	1
Boron	0.705		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:20	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:20	1
Calcium	55.0		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:20	1
Chromium	0.0169		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:20	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:20	1
Iron	0.123		0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:20	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:20	1
Lithium	0.0131		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:20	1
Molybdenum	0.0108		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:20	1
Selenium	0.0663		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:20	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:20	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	4.33	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	366		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-07

Lab Sample ID: 310-271001-7

Date Collected: 12/05/23 10:35

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	30.3		5.00	2.25	mg/L			12/07/23 14:13	5
Nitrate as N	9.11	H	1.00	0.390	mg/L			12/07/23 14:13	5
Fluoride	0.648	J	1.00	0.375	mg/L			12/07/23 14:13	5
Sulfate	172		5.00	2.10	mg/L			12/07/23 14:13	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:23	1
Arsenic	0.00295		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:23	1
Barium	0.0347		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:23	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:23	1
Boron	0.813		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:23	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:23	1
Calcium	48.1		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:23	1
Chromium	0.0164		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:23	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:23	1
Iron	<0.100		0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:23	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:23	1
Lithium	0.0149		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:23	1
Molybdenum	0.0146		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:23	1
Selenium	0.0540		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:23	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:23	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:52	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	2.33	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	364		50.0	34.0	mg/L			12/08/23 17:15	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-08

Lab Sample ID: 310-271001-8

Date Collected: 12/05/23 14:25

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	29.5		5.00	2.25	mg/L			12/07/23 14:25	5
Nitrate as N	10.8		1.00	0.390	mg/L			12/07/23 14:25	5
Fluoride	0.782	J	1.00	0.375	mg/L			12/07/23 14:25	5
Sulfate	165		5.00	2.10	mg/L			12/07/23 14:25	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:27	1
Arsenic	0.00371		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:27	1
Barium	0.0484		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:27	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:27	1
Boron	0.916		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:27	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:27	1
Calcium	42.1		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:27	1
Chromium	0.0330		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:27	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:27	1
Iron	0.0605	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:27	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:27	1
Lithium	0.0117		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:27	1
Molybdenum	0.0252		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:27	1
Selenium	0.0602		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:27	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:27	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:54	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	3.67	J H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	344		50.0	34.0	mg/L			12/08/23 17:15	1

Eurofins Cedar Falls

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-09

Lab Sample ID: 310-271001-9

Date Collected: 12/04/23 15:10

Matrix: Water

Date Received: 12/07/23 09:40

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	27.0		5.00	2.25	mg/L			12/07/23 14:37	5
Nitrate as N	10.8	H H3	1.00	0.390	mg/L			12/07/23 14:37	5
Fluoride	1.39		1.00	0.375	mg/L			12/07/23 14:37	5
Sulfate	99.1		5.00	2.10	mg/L			12/07/23 14:37	5

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:30	1
Arsenic	0.00246		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:30	1
Barium	0.0532		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:30	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:30	1
Boron	1.40		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:30	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:30	1
Calcium	25.8		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:30	1
Chromium	0.0575		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:30	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:30	1
Iron	0.0453	J	0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:30	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:30	1
Lithium	0.00982	J	0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:30	1
Molybdenum	0.0301		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:30	1
Selenium	0.0880		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:30	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:30	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 10:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	<5.00	H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	230		50.0	34.0	mg/L			12/08/23 17:15	1

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: FB-01
Date Collected: 12/05/23 09:00
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-10
Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.450	mg/L			12/07/23 14:49	1
Nitrate as N	<0.200	H H3	0.200	0.0780	mg/L			12/07/23 14:49	1
Fluoride	<0.200		0.200	0.0750	mg/L			12/07/23 14:49	1
Sulfate	<1.00		1.00	0.420	mg/L			12/07/23 14:49	1

Method: SW846 6020B - Metals (ICP/MS)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 15:33	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 15:33	1
Barium	<0.00200		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 15:33	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 15:33	1
Boron	<0.100		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 15:33	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 15:33	1
Calcium	<0.500		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 15:33	1
Chromium	<0.00500		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 15:33	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 15:33	1
Iron	<0.100		0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 15:33	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 15:33	1
Lithium	<0.0100		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 15:33	1
Molybdenum	<0.00200		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 15:33	1
Selenium	<0.00500		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 15:33	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 15:33	1

Method: SW846 7470A - Mercury (CVAA)									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:44	12/14/23 11:03	1

General Chemistry									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS +3765-65)	<5.00	H	5.00	1.70	mg/L			12/15/23 18:57	1
Total Dissolved Solids (SM 2540C)	<50.0		50.0	34.0	mg/L			12/08/23 17:15	1

Definitions/Glossary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
a	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
MLQ	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

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-408311/3									
Matrix: Water									
Analysis Batch: 408311									
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	0.450	mg/L			12/07/23 11:36	1
Fluoride	<0.200		0.200	0.0750	mg/L			12/07/23 11:36	1
Sulfate	<1.00		1.00	0.420	mg/L			12/07/23 11:36	1

Lab Sample ID: LCS 310-408311/4									
Matrix: Water									
Analysis Batch: 408311									
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	10.11		mg/L		101	90 - 110		
Fluoride	2.00	2.111		mg/L		106	90 - 110		
Sulfate	10.0	10.63		mg/L		106	90 - 110		

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-408511/1-A									
Matrix: Water									
Analysis Batch: 408763									
Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 408511									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/12/23 10:00	12/13/23 14:23	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		12/12/23 10:00	12/13/23 14:23	1
Barium	<0.00200		0.00200	0.000640	mg/L		12/12/23 10:00	12/13/23 14:23	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/12/23 10:00	12/13/23 14:23	1
Boron	<0.100		0.100	0.0760	mg/L		12/12/23 10:00	12/13/23 14:23	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/12/23 10:00	12/13/23 14:23	1
Calcium	<0.500		0.500	0.190	mg/L		12/12/23 10:00	12/13/23 14:23	1
Chromium	<0.00500		0.00500	0.00110	mg/L		12/12/23 10:00	12/13/23 14:23	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/12/23 10:00	12/13/23 14:23	1
Iron	<0.100		0.100	0.0360	mg/L		12/12/23 10:00	12/13/23 14:23	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/12/23 10:00	12/13/23 14:23	1
Lithium	<0.0100		0.0100	0.00250	mg/L		12/12/23 10:00	12/13/23 14:23	1
Molybdenum	<0.00200		0.00200	0.000910	mg/L		12/12/23 10:00	12/13/23 14:23	1
Selenium	<0.00500		0.00500	0.00140	mg/L		12/12/23 10:00	12/13/23 14:23	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/12/23 10:00	12/13/23 14:23	1

Lab Sample ID: LCS 310-408511/2-A									
Matrix: Water									
Analysis Batch: 408763									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 408511									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Antimony	0.200	0.2123		mg/L		106	80 - 120		
Arsenic	0.200	0.2045		mg/L		102	80 - 120		
Barium	0.100	0.1018		mg/L		102	80 - 120		
Beryllium	0.100	0.09975		mg/L		100	80 - 120		
Boron	0.200	0.2119		mg/L		106	80 - 120		
Cadmium	0.100	0.09645		mg/L		96	80 - 120		
Chromium	0.100	0.09945		mg/L		99	80 - 120		
Cobalt	0.100	0.1007		mg/L		101	80 - 120		

Eurofins Cedar Falls

QC Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

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

Lab Sample ID: LCS 310-408511/2-A									
Matrix: Water									
Analysis Batch: 408763									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 408511									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Iron	0.200	0.2181		mg/L		109	80 - 120		
Lead	0.200	0.2024		mg/L		101	80 - 120		
Lithium	0.200	0.2039		mg/L		102	80 - 120		
Molybdenum	0.200	0.1991		mg/L		100	80 - 120		
Selenium	0.400	0.3813		mg/L		95	80 - 120		
Thallium	0.200	0.1694		mg/L		85	80 - 120		

Lab Sample ID: LCS 310-408511/2-A									
Matrix: Water									
Analysis Batch: 408895									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 408511									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Calcium	2.00	2.011		mg/L		101	80 - 120		

Lab Sample ID: 310-271001-10 DU									
Matrix: Water									
Analysis Batch: 408763									
Client Sample ID: FB-01									
Prep Type: Total/NA									
Prep Batch: 408511									
Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit	
Antimony	<0.00200		<0.00200		mg/L		NC	20	
Arsenic	<0.00200		<0.00200		mg/L		NC	20	
Barium	<0.00200		<0.00200		mg/L		NC	20	
Beryllium	<0.00100		<0.00100		mg/L		NC	20	
Boron	<0.100		<0.100		mg/L		NC	20	
Cadmium	<0.000200		<0.000200		mg/L		NC	20	
Calcium	<0.500		<0.500		mg/L		NC	20	
Chromium	<0.00500		<0.00500		mg/L		NC	20	
Cobalt	<0.000500		<0.000500		mg/L		NC	20	
Iron	<0.100		<0.100		mg/L		NC	20	
Lead	<0.000500		<0.000500		mg/L		NC	20	
Lithium	<0.0100		<0.0100		mg/L		NC	20	
Molybdenum	<0.00200		<0.00200		mg/L		NC	20	
Selenium	<0.00500		<0.00500		mg/L		NC	20	
Thallium	<0.00100		<0.00100		mg/L		NC	20	

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-408717/1-A									
Matrix: Water									
Analysis Batch: 408885									
Client Sample ID: Method Blank									
Prep Type: Total/NA									
Prep Batch: 408717									
Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/13/23 10:43	12/14/23 10:05	1

Lab Sample ID: LCS 310-408717/2-A									
Matrix: Water									
Analysis Batch: 408885									
Client Sample ID: Lab Control Sample									
Prep Type: Total/NA									
Prep Batch: 408717									
Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Mercury	0.00167	0.001650		mg/L		99	80 - 120		

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Method: 7470A - Mercury (CVAA)

Lab Sample ID: 310-271001-1 MS
Matrix: Water
Analysis Batch: 408885

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 408717

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.000200		0.00167	0.001487		mg/L		89	80 - 120

Lab Sample ID: 310-271001-1 MSD
Matrix: Water
Analysis Batch: 408885

Client Sample ID: MW-01
Prep Type: Total/NA
Prep Batch: 408717

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	Limit
Mercury	<0.000200		0.00167	0.001710		mg/L		103	80 - 120	14	20

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-409087/1
Matrix: Water
Analysis Batch: 409087

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			12/15/23 18:57	1

Lab Sample ID: LCS 310-409087/2
Matrix: Water
Analysis Batch: 409087

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	98.00		mg/L		98	75 - 116

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

Lab Sample ID: MB 310-408324/1
Matrix: Water
Analysis Batch: 408324

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	34.0	mg/L			12/09/23 17:15	1

Lab Sample ID: LCS 310-408324/2
Matrix: Water
Analysis Batch: 408324

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	924.0		mg/L		92	80 - 110

Lab Sample ID: 310-271001-10 DU
Matrix: Water
Analysis Batch: 408324

Client Sample ID: FB-01
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids	<50.0		<50.0		mg/L		NC	20

Eurofins Cedar Falls

QC Association Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

HPLC/IC

Analysis Batch: 408311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	9056A	
310-271001-2	MW-2B	Total/NA	Water	9056A	
310-271001-3	MW-108	Total/NA	Water	9056A	
310-271001-4	MW-4B	Total/NA	Water	9056A	
310-271001-5	MW-5B	Total/NA	Water	9056A	
310-271001-6	MW-06	Total/NA	Water	9056A	
310-271001-7	MW-07	Total/NA	Water	9056A	
310-271001-8	MW-08	Total/NA	Water	9056A	
310-271001-9	MW-09	Total/NA	Water	9056A	
310-271001-10	FB-01	Total/NA	Water	9056A	
MB 310-408311/3	Method Blank	Total/NA	Water	9056A	
LCS 310-408311/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 408511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	3005A	
310-271001-2	MW-2B	Total/NA	Water	3005A	
310-271001-3	MW-108	Total/NA	Water	3005A	
310-271001-4	MW-4B	Total/NA	Water	3005A	
310-271001-5	MW-5B	Total/NA	Water	3005A	
310-271001-6	MW-06	Total/NA	Water	3005A	
310-271001-7	MW-07	Total/NA	Water	3005A	
310-271001-8	MW-08	Total/NA	Water	3005A	
310-271001-9	MW-09	Total/NA	Water	3005A	
310-271001-10	FB-01	Total/NA	Water	3005A	
MB 310-408511/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-408511/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-271001-10 DU	FB-01	Total/NA	Water	3005A	

Prep Batch: 408717

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	7470A	
310-271001-2	MW-2B	Total/NA	Water	7470A	
310-271001-3	MW-108	Total/NA	Water	7470A	
310-271001-4	MW-4B	Total/NA	Water	7470A	
310-271001-5	MW-5B	Total/NA	Water	7470A	
310-271001-6	MW-06	Total/NA	Water	7470A	
310-271001-7	MW-07	Total/NA	Water	7470A	
310-271001-8	MW-08	Total/NA	Water	7470A	
310-271001-9	MW-09	Total/NA	Water	7470A	
310-271001-10	FB-01	Total/NA	Water	7470A	
MB 310-408717/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-408717/2-A	Lab Control Sample	Total/NA	Water	7470A	
310-271001-1 MS	MW-01	Total/NA	Water	7470A	
310-271001-1 MSD	MW-01	Total/NA	Water	7470A	

Analysis Batch: 408763

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	6020B	408511

Eurofins Cedar Falls

QC Association Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Walls

Metals (Continued)

Analysis Batch: 408763 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-2	MW-2B	Total/NA	Water	6020B	408511
310-271001-3	MW-108	Total/NA	Water	6020B	408511
310-271001-4	MW-4B	Total/NA	Water	6020B	408511
310-271001-5	MW-5B	Total/NA	Water	6020B	408511
310-271001-6	MW-06	Total/NA	Water	6020B	408511
310-271001-7	MW-07	Total/NA	Water	6020B	408511
310-271001-8	MW-08	Total/NA	Water	6020B	408511
310-271001-9	MW-09	Total/NA	Water	6020B	408511
310-271001-10	FB-01	Total/NA	Water	6020B	408511
MB 310-408511/1-A	Method Blank	Total/NA	Water	6020B	408511
LCS 310-408511/2-A	Lab Control Sample	Total/NA	Water	6020B	408511
310-271001-10 DU	FB-01	Total/NA	Water	6020B	408511

Analysis Batch: 408885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	7470A	408717
310-271001-2	MW-2B	Total/NA	Water	7470A	408717
310-271001-3	MW-108	Total/NA	Water	7470A	408717
310-271001-4	MW-4B	Total/NA	Water	7470A	408717
310-271001-5	MW-5B	Total/NA	Water	7470A	408717
310-271001-6	MW-06	Total/NA	Water	7470A	408717
310-271001-7	MW-07	Total/NA	Water	7470A	408717
310-271001-8	MW-08	Total/NA	Water	7470A	408717
310-271001-9	MW-09	Total/NA	Water	7470A	408717
310-271001-10	FB-01	Total/NA	Water	7470A	408717
MB 310-408717/1-A	Method Blank	Total/NA	Water	7470A	408717
LCS 310-408717/2-A	Lab Control Sample	Total/NA	Water	7470A	408717
310-271001-1 MS	MW-01	Total/NA	Water	7470A	408717
310-271001-1 MSD	MW-01	Total/NA	Water	7470A	408717

Analysis Batch: 408895

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-408511/2-A	Lab Control Sample	Total/NA	Water	6020B	408511

General Chemistry

Analysis Batch: 408324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	SM 2540C	
310-271001-2	MW-2B	Total/NA	Water	SM 2540C	
310-271001-3	MW-108	Total/NA	Water	SM 2540C	
310-271001-4	MW-4B	Total/NA	Water	SM 2540C	
310-271001-5	MW-5B	Total/NA	Water	SM 2540C	
310-271001-6	MW-06	Total/NA	Water	SM 2540C	
310-271001-7	MW-07	Total/NA	Water	SM 2540C	
310-271001-8	MW-08	Total/NA	Water	SM 2540C	
310-271001-9	MW-09	Total/NA	Water	SM 2540C	
310-271001-10	FB-01	Total/NA	Water	SM 2540C	
MB 310-408324/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-408324/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-271001-10 DU	FB-01	Total/NA	Water	SM 2540C	

Eurofins Cedar Falls

QC Association Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Walls

General Chemistry

Analysis Batch: 409087

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271001-1	MW-01	Total/NA	Water	I-3765-85	
310-271001-2	MW-2B	Total/NA	Water	I-3765-85	
310-271001-3	MW-108	Total/NA	Water	I-3765-85	
310-271001-4	MW-4B	Total/NA	Water	I-3765-85	
310-271001-5	MW-5B	Total/NA	Water	I-3765-85	
310-271001-6	MW-06	Total/NA	Water	I-3765-85	
310-271001-7	MW-07	Total/NA	Water	I-3765-85	
310-271001-8	MW-08	Total/NA	Water	I-3765-85	
310-271001-9	MW-09	Total/NA	Water	I-3765-85	
310-271001-10	FB-01	Total/NA	Water	I-3765-85	
MB 310-409087/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-409087/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Eurofins Cedar Falls

Client Sample ID: MW-01
Date Collected: 12/05/23 13:15
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 12:36
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 14:32
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:18
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-2B
Date Collected: 12/05/23 14:00
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 13:12
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 14:35
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:42
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-108
Date Collected: 12/05/23 11:30
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 13:24
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:11
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:44
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-4B
Date Collected: 12/05/23 09:40
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 13:36
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:14
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:46

Client Sample ID: MW-4B
Date Collected: 12/05/23 09:40
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-5B
Date Collected: 12/04/23 14:10
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 13:48
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:17
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:48
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-06
Date Collected: 12/04/23 15:55
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 14:01
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:20
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:50
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-07
Date Collected: 12/05/23 10:35
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 14:13
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:23
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:52
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Client Sample ID: MW-08
Date Collected: 12/05/23 14:25
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 14:25
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:27
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:54
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: MW-09
Date Collected: 12/04/23 15:10
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	408311	QTZ5	EET CF	12/07/23 14:37
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:30
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 10:56
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

Client Sample ID: FB-01
Date Collected: 12/05/23 09:00
Date Received: 12/07/23 09:40

Lab Sample ID: 310-271001-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		1	408311	QTZ5	EET CF	12/07/23 14:49
Total/NA	Prep	3005A			408511	KCK5	EET CF	12/12/23 10:00
Total/NA	Analysis	6020B		1	408763	A6US	EET CF	12/13/23 15:33
Total/NA	Prep	7470A			408717	NFT2	EET CF	12/13/23 10:44
Total/NA	Analysis	7470A		1	408885	NFT2	EET CF	12/14/23 11:03
Total/NA	Analysis	I-3765-85		1	409087	D7CP	EET CF	12/15/23 18:57
Total/NA	Analysis	SM 2540C		1	408324	D7CP	EET CF	12/08/23 17:15

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

Accreditation/Certification Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Wells

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	IA100001	09-29-24

Method Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271001-1
SDG: CCR Network Walls

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
1-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF

Protocol References:

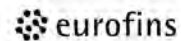
SM = "Standard Methods For The Examination Of Water And Wastewater"

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

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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



Environment Testing
America



Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>PPGA</u>			
City/State:	CITY <u>Hastings</u>	STATE <u>NE</u>	Project:
Receipt Information			
Date/Time Received:	DATE <u>12/2/22</u>	TIME <u>0940</u>	Received By: <u>MAH</u>
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?		☒ Yes ☐ No If yes: Cooler custody seals intact? ☒ Yes ☐ No	
Sample Custody Seals Present?		☐ 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: <u>X</u>		Correction Factor (°C): <u>0.0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.3</u>		Corrected Temp (°C): <u>0.3</u>	
• 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			

Document CED-P-SAM-FRM45521

Revision: 26

Date 27 Jan 2022

Eurofins Cedar Falls

12/18/2023

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Page 32 of 34

General temperature criteria is 0 to 6°C

Bacteria temperature criteria is 0 to 10°C

12/18/2023

Page 31 of 34

Cedar Falls, IA 50613
Phone 319.277.2401 Fax 319.277.2425

Regulatory Program: ☐ DW ☐ HPIES ☐ SDQA ☐ Other

Project Manager: Jenny Sidel

Client Contact
PPGA
Hastings, NE 68601
(xxx) xxx-xxxx Phone
(xxx) xxx-xxxx FAX
Project Name WEC MW Sampling
CCR Network Wells
P O # 8-501 5

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from below
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

Sample Identification	Sample Date	Sample Type (O-C, G, G-Date)	Matrix	# of Cont.	Filtered Sample (Y / N)	Performance (MSD (Y / N))	Metals	Iron	Sulfate	TDS	Molybdenum	Selenium	Lithium	Mercury	Fluoride	Total Boron	Total Calcium	TSS	Nitrate	Sample Specific Notes
MW-01	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-2B	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-108	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-4B	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-5B	12/4/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-06	12/4/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-07	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-08	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-09	12/4/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	
FB-01	12/5/23	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl, 3= H2SO4, 4=HNO3, 5=NaOH, 6= Other

Possible Hazard Identification:
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Special Instructions/IOC Requirements & Comments: Please report MDL and RL on lab results report.

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Dispose by Lab ☐ Archive for _____ Months

Custody Seal Intact	Relinquished by	Relinquished for	Relinquished by	Therm ID No	Date/Time	Company	Cor'd	Cooler Temp (°C)	Obs'd	Received by	Date/Time	Company	Received in Laboratory by	Date/Time	Company
☒ Yes ☐ No															

Client: Hastings Utilities

Login Number: 271001
List Number: 1
Creator: Costello, Mackenzie K

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. True

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

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

13

Login Sample Receipt Checklist

Job Number: 310-271001-1
SDG Number: CCR Network Wells
List Source: Eurofins Cedar Falls

ANALYTICAL REPORT

PREPARED FOR

Attn: Jenny Sidlo
Hastings Utilities
1228 North Denver Ave
PO BOX 289
Hastings, Nebraska 68901
Generated 12/20/2023 2:33:14 PM

JOB DESCRIPTION

WEC MW Sampling

JOB NUMBER

310-271494-1

Eurofins Cedar Falls

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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12/20/2023 2:33:14 PM

Authorized for release by
Emily Mathews, Project Management Assistant I
Emily.Mathews@et.eurofinsus.com
(319)277-2401

Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Sample Summary	5
Detection Summary	6
Client Sample Results	7
Definitions	8
QC Sample Results	9
QC Association	12
Chronicle	13
Certification Summary	14
Method Summary	15
Chain of Custody	16
Receipt Checklists	18

Case Narrative

Client: Hastings Utilities
Project: WEC MW Sampling

Job ID: 310-271494-1

Job ID: 310-271494-1

Eurofins Cedar Falls

Job Narrative 310-271494-1

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 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 sample was received on 12/14/2023 8:50 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.1°C

HPLC/IC

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

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

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Sample Summary

Job ID: 310-271494-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-271494-1	MW-3R	Water	12/07/23 14:10	12/14/23 08:50

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Detection Summary

Job ID: 310-271494-1

Client Sample ID: MW-3R

Lab Sample ID: 310-271494-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	31.8		5.00	2.25	mg/L	5		300.0	Total/NA
Nitrate as N	3.88	H H3	1.00	0.390	mg/L	5		300.0	Total/NA
Sulfate	214		5.00	2.10	mg/L	5		300.0	Total/NA
Arsenic	0.00252		0.00200	0.000530	mg/L	1		200.8	Total/NA
Barium	0.0642		0.00200	0.000640	mg/L	1		200.8	Total/NA
Boron	0.687		0.100	0.0760	mg/L	1		200.8	Total/NA
Calcium	62.1		0.500	0.190	mg/L	1		200.8	Total/NA
Chromium	0.00334	J	0.00500	0.00110	mg/L	1		200.8	Total/NA
Lithium	0.0361		0.0100	0.00250	mg/L	1		200.8	Total/NA
Molybdenum	0.00820		0.00200	0.000910	mg/L	1		200.8	Total/NA
Selenium	0.0216		0.00500	0.00140	mg/L	1		200.8	Total/NA
Total Dissolved Solids	484		50.0	34.0	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Client Sample Results

Job ID: 310-271494-1

Client Sample ID: MW-3R

Lab Sample ID: 310-271494-1

Date Collected: 12/07/23 14:10

Matrix: Water

Date Received: 12/14/23 08:50

Method: EPA 300.0 - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	31.8		5.00	2.25	mg/L			12/14/23 14:40	5
Nitrate as N	3.88	H H3	1.00	0.390	mg/L			12/14/23 14:40	5
Fluoride	<1.00		1.00	0.375	mg/L			12/14/23 14:40	5
Sulfate	214		5.00	2.10	mg/L			12/14/23 14:40	5

Method: EPA 200.8 - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00200		0.00200	0.00100	mg/L		12/15/23 10:00	12/18/23 13:41	1
Arsenic	0.00252		0.00200	0.000530	mg/L		12/15/23 10:00	12/18/23 13:41	1
Barium	0.0642		0.00200	0.000640	mg/L		12/15/23 10:00	12/18/23 13:41	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/15/23 10:00	12/18/23 13:41	1
Boron	0.687		0.100	0.0760	mg/L		12/15/23 10:00	12/18/23 13:41	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/15/23 10:00	12/18/23 13:41	1
Calcium	62.1		0.500	0.190	mg/L		12/15/23 10:00	12/18/23 13:41	1
Chromium	0.00334	J	0.00500	0.00110	mg/L		12/15/23 10:00	12/18/23 13:41	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/15/23 10:00	12/18/23 13:41	1
Iron	<0.100		0.100	0.0360	mg/L		12/15/23 10:00	12/18/23 13:41	1
Lead	<0.000500		0.000500	0.000240	mg/L		12/15/23 10:00	12/18/23 13:41	1
Lithium	0.0361		0.0100	0.00250	mg/L		12/15/23 10:00	12/18/23 13:41	1
Manganese	<0.0100		0.0100	0.00360	mg/L		12/15/23 10:00	12/18/23 13:41	1
Molybdenum	0.00820		0.00200	0.000910	mg/L		12/15/23 10:00	12/18/23 13:41	1
Nickel	<0.00500		0.00500	0.00190	mg/L		12/15/23 10:00	12/18/23 13:41	1
Selenium	0.0216		0.00500	0.00140	mg/L		12/15/23 10:00	12/18/23 13:41	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/15/23 10:00	12/18/23 13:41	1

Method: EPA 245.1 - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000140	mg/L		12/19/23 11:12	12/20/23 11:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS 1-3765-85)	<5.00		5.00	1.70	mg/L			12/14/23 13:55	1
Total Dissolved Solids (SM 2540C)	484		50.0	34.0	mg/L			12/14/23 15:26	1

Eurofins Cedar Falls

Definitions/Glossary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271494-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.

Metals

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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

Eurofins Cedar Falls

Client: Hastings Utilities
Project/Site: WEC MW Sampling

QC Sample Results

Job ID: 310-271494-1

Method: 300.0 - Anions, Ion Chromatography

Lab Sample ID: MB 310-409028/3
Matrix: Water
Analysis Batch: 409028

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Chloride	<1.00		1.00	0.450	mg/L			12/14/23 14:16	1
Fluoride	<0.200		0.200	0.0750	mg/L			12/14/23 14:16	1
Sulfate	<1.00		1.00	0.420	mg/L			12/14/23 14:16	1

Lab Sample ID: LCS 310-409028/4
Matrix: Water
Analysis Batch: 409028

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Chloride	10.0	10.47		mg/L		105	90 - 110
Fluoride	2.00	2.163		mg/L		108	90 - 110
Sulfate	10.0	10.78		mg/L		108	90 - 110

Lab Sample ID: 310-271494-1 MS
Matrix: Water
Analysis Batch: 409028

Client Sample ID: MW-3R
Prep Type: Total/NA

Analyte	Sample Sample		Spike Added	MS MS		Unit	D	%Rec	%Rec Limits
	Result	Qualifier		Result	Qualifier				
Chloride	31.8		25.0	56.52		mg/L		99	80 - 120
Nitrate as N	3.88		5.00	9.150		mg/L		105	80 - 120
Fluoride	<1.00		5.00	5.455		mg/L		109	80 - 120
Sulfate	214		25.0	235.3	4	mg/L		84	80 - 120

Lab Sample ID: 310-271494-1 MSD
Matrix: Water
Analysis Batch: 409028

Client Sample ID: MW-3R
Prep Type: Total/NA

Analyte	Sample Sample		Spike Added	MSD MSD		Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
	Result	Qualifier		Result	Qualifier						
Chloride	31.8		25.0	56.63		mg/L		99	80 - 120	0	15
Nitrate as N	3.88		5.00	9.191		mg/L		106	80 - 120	0	15
Fluoride	<1.00		5.00	5.508		mg/L		110	80 - 120	1	15
Sulfate	214		25.0	233.2	4	mg/L		75	80 - 120	1	15

Method: 200.8 - Metals (ICP/MS)

Lab Sample ID: MB 310-408912/1-A
Matrix: Water
Analysis Batch: 409239

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408912

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Antimony	<0.00200		0.00200	0.00100	mg/L		12/15/23 10:00	12/18/23 12:04	1
Arsenic	<0.00200		0.00200	0.000530	mg/L		12/15/23 10:00	12/18/23 12:04	1
Barium	<0.00200		0.00200	0.000640	mg/L		12/15/23 10:00	12/18/23 12:04	1
Beryllium	<0.00100		0.00100	0.000330	mg/L		12/15/23 10:00	12/18/23 12:04	1
Boron	<0.100		0.100	0.0760	mg/L		12/15/23 10:00	12/18/23 12:04	1
Cadmium	<0.000200		0.000200	0.000100	mg/L		12/15/23 10:00	12/18/23 12:04	1
Calcium	<0.500		0.500	0.190	mg/L		12/15/23 10:00	12/18/23 12:04	1
Chromium	<0.00500		0.00500	0.00110	mg/L		12/15/23 10:00	12/18/23 12:04	1
Cobalt	<0.000500		0.000500	0.000170	mg/L		12/15/23 10:00	12/18/23 12:04	1
Iron	<0.100		0.100	0.0360	mg/L		12/15/23 10:00	12/18/23 12:04	1

Eurolins Cedar Falls

QC Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271494-1

Method: 200.8 - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-408912/1-A
Matrix: Water
Analysis Batch: 409239

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 408912

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Lead	<0.000500		0.000500	0.000240	mg/L		12/15/23 10:00	12/18/23 12:04	1
Lithium	<0.0100		0.0100	0.00250	mg/L		12/15/23 10:00	12/18/23 12:04	1
Manganese	<0.0100		0.0100	0.00360	mg/L		12/15/23 10:00	12/18/23 12:04	1
Molybdenum	<0.00200		0.00200	0.000910	mg/L		12/15/23 10:00	12/18/23 12:04	1
Nickel	<0.00500		0.00500	0.00190	mg/L		12/15/23 10:00	12/18/23 12:04	1
Selenium	<0.00500		0.00500	0.00140	mg/L		12/15/23 10:00	12/18/23 12:04	1
Thallium	<0.00100		0.00100	0.000260	mg/L		12/15/23 10:00	12/18/23 12:04	1

Lab Sample ID: LCS 310-408912/2-A
Matrix: Water
Analysis Batch: 409239

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 408912

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Antimony	0.200	0.2100		mg/L		105	85 - 115
Arsenic	0.200	0.2122		mg/L		106	85 - 115
Barium	0.100	0.1064		mg/L		105	85 - 115
Beryllium	0.100	0.1027		mg/L		103	85 - 115
Boron	0.200	0.1803		mg/L		90	85 - 115
Cadmium	0.100	0.09868		mg/L		99	85 - 115
Calcium	2.00	2.247		mg/L		112	85 - 115
Chromium	0.100	0.1088		mg/L		109	85 - 115
Cobalt	0.100	0.1050		mg/L		105	85 - 115
Iron	0.200	0.2199		mg/L		110	85 - 115
Lead	0.200	0.2025		mg/L		101	85 - 115
Lithium	0.200	0.2186		mg/L		109	85 - 115
Manganese	0.100	0.1074		mg/L		107	85 - 115
Molybdenum	0.200	0.2096		mg/L		105	85 - 115
Nickel	0.200	0.2136		mg/L		107	85 - 115
Selenium	0.400	0.3880		mg/L		97	85 - 115
Thallium	0.200	0.1826		mg/L		91	85 - 115

Method: 245.1 - Mercury (CVAA)

Lab Sample ID: MB 310-409321/1-A
Matrix: Water
Analysis Batch: 409464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 409321

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Mercury	<0.000200		0.000200	0.000140	mg/L		12/19/23 11:12	12/20/23 11:08	1

Lab Sample ID: LCS 310-409321/2-A
Matrix: Water
Analysis Batch: 409464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 409321

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec Limits
		Result	Qualifier				
Mercury	0.00167	0.001693		mg/L		102	85 - 115

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Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-408891/1
Matrix: Water
Analysis Batch: 408891

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Suspended Solids	<5.00		5.00	1.70	mg/L			12/14/23 13:55	1

Lab Sample ID: LCS 310-408891/2
Matrix: Water
Analysis Batch: 408891

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Suspended Solids	100	94.00		mg/L		94	75 - 116

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

Lab Sample ID: MB 310-408902/1
Matrix: Water
Analysis Batch: 408902

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Total Dissolved Solids	<50.0		50.0	34.0	mg/L			12/14/23 15:26	1

Lab Sample ID: LCS 310-408902/2
Matrix: Water
Analysis Batch: 408902

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	942.0		mg/L		94	90 - 110

QC Association Summary

HPLC/IC

Analysis Batch: 409028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	300.0	
MB 310-409028/3	Method Blank	Total/NA	Water	300.0	
LCS 310-409028/4	Lab Control Sample	Total/NA	Water	300.0	
310-271494-1 MS	MW-3R	Total/NA	Water	300.0	
310-271494-1 MSD	MW-3R	Total/NA	Water	300.0	

Metals

Prep Batch: 408912

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	200.8	
MB 310-408912/1-A	Method Blank	Total/NA	Water	200.8	
LCS 310-408912/2-A	Lab Control Sample	Total/NA	Water	200.8	

Analysis Batch: 409239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	200.8	408912
MB 310-408912/1-A	Method Blank	Total/NA	Water	200.8	408912
LCS 310-408912/2-A	Lab Control Sample	Total/NA	Water	200.8	408912

Prep Batch: 409321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	245.1	
MB 310-409321/1-A	Method Blank	Total/NA	Water	245.1	
LCS 310-409321/2-A	Lab Control Sample	Total/NA	Water	245.1	

Analysis Batch: 409464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	245.1	409321
MB 310-409321/1-A	Method Blank	Total/NA	Water	245.1	409321
LCS 310-409321/2-A	Lab Control Sample	Total/NA	Water	245.1	409321

General Chemistry

Analysis Batch: 408891

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	I-3765-85	
MB 310-408891/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-408891/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 408902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-271494-1	MW-3R	Total/NA	Water	SM 2540C	
MB 310-408902/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-408902/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Client Sample ID: MW-3R
Date Collected: 12/07/23 14:10
Date Received: 12/14/23 08:50

Lab Sample ID: 310-271494-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	300.0		5	408028	QTZ5	EET CF	12/14/23 14:40
Total/NA	Prep	200.8			408812	KCK5	EET CF	12/15/23 10:00
Total/NA	Analysis	200.8		1	409239	A6US	EET CF	12/18/23 13:41
Total/NA	Prep	245.1			409321	NFT2	EET CF	12/19/23 11:12
Total/NA	Analysis	245.1		1	409464	NFT2	EET CF	12/20/23 11:31
Total/NA	Analysis	I-3785-85		1	408891	WZC8	EET CF	12/14/23 13:55
Total/NA	Analysis	SM 2540C		1	408902	D7CP	EET CF	12/14/23 15:26

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

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	IA100001	09-29-24

Method Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-271494-1

Method	Method Description	Protocol	Laboratory
300.0	Anions, Ion Chromatography	EPA	EET CF
200.8	Metals (ICP/MS)	EPA	EET CF
245.1	Mercury (CVAA)	EPA	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET CF
200.8	Preparation, Total Metals	EPA	EET CF
245.1	Preparation, Mercury	EPA	EET CF

Protocol References:

EPA = US Environmental Protection Agency

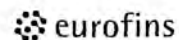
SM = "Standard Methods For The Examination Of Water And Wastewater"

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

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

Eurofins Cedar Falls



Environment Testing
America



310-271494 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information			
Client: <u>Hastings</u>		STATE: <u>NE</u>	Project:
City/State: <u>NE</u>			
Receipt Information			
Date/Time Received:	DATE: <u>12-14-23</u>	TIME: <u>850</u>	Received By: <u>ML</u>
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?		If yes: Cooler ID: _____	
☒ Yes ☐ No			
Multiple Coolers?		If yes: Cooler # _____ of _____	
☐ Yes ☒ No			
Cooler Custody Seals Present?		If yes: Cooler custody seals intact? ☐ Yes ☐ No	
☐ Yes ☒ No			
Sample Custody Seals Present?		If yes: Sample custody seals intact? ☐ Yes ☐ No	
☐ Yes ☒ No			
Trip Blank Present?		If yes: Which VOA samples are in cooler? _____	
☐ Yes ☒ No			
Temperature Record			
Coolant: ☒ Wet Ice ☐ Blue Ice ☐ Dry Ice ☐ Other: _____ ☐ NONE			
Thermometer ID: <u>X</u>		Correction Factor (°C): <u>0</u>	
• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature			
Uncorrected Temp (°C): <u>0.1</u>		Corrected Temp (°C): <u>0.1</u>	
• 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			

Regulatory Program: ☐ RCRA ☐ RCMA ☐ Other

Project Manager: Jenny Sidlo

Site Contact: _____ Date: _____

Lab Contact: _____

Analysis Turnaround Time

☐ CALENDAR DAYS ☐ WORKING DAYS

TAT if different from Below _____

2 weeks ☐

1 week ☐

2 days ☐

1 day ☐

Sample Identification

MW-SR

Sample Date 12/7/23

Sample Time 14:10

Sample Type (C=Comp, G=Other)

G

Matrix Cont. 2

Full Metals ☐

Perform MS/MSD (Y/N) ☐

Filtered Sample (Y/N) ☐

Carrier: _____

For Lab Use Only: Walk-in Client: Lab Sampling

Job / SDG No

Sample Specific Notes

Run nitrate every 10th out of field time

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return to Client ☐ Exposed by Lab ☐ Active for _____ Months

Special Instructions/QC Requirements & Comments: Please report MDL and RL on lab results report.

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

Non-Hazard ☐ Reusable ☐ Skin Irritant ☐ Person B ☐ Unknown ☐

Custody Seal Subject: _____ Yes ☐ No ☐

Relinquished by: _____

Relinquished by: _____

Relinquished by: _____

Relinquished by: _____

Therm ID No _____

Date/Time 12-14-23 850

Date/Time _____

Date/Time _____

Date/Time _____

Form No. CA-C-WI-002, Rev. 4.3, dated 12/05/2013

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 310-271494-1

Login Number: 271494

List Number: 1

Creator: Costello, Mackenzie K

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	

ANALYTICAL REPORT

PREPARED FOR

Attn: Jenny Sidlo
 Hastings Utilities
 1228 North Denver Ave
 PO BOX 289
 Hastings, Nebraska 68901
 Generated 1/15/2024 6:04:14 PM

JOB DESCRIPTION

WEC MW Sampling

JOB NUMBER

160-52560-1

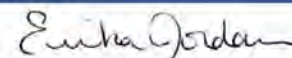
Eurofins St. Louis

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 TestAmerica Project Manager.

Authorization



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 1/15/2024 6:04:14 PM

Authorized for release by
 Erika Jordan, Project Manager
 erika.jordan@el.eurofinsus.com
 (314)298-8566

Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Chain of Custody	6
Receipt Checklists	7
Definitions/Glossary	8
Method Summary	9
Sample Summary	10
Client Sample Results	11
QC Sample Results	17
QC Association Summary	18
Tracer Carrier Summary	19

Case Narrative

Client: Hastings Utilities
Project: WEC MW Sampling

Job ID: 160-52560-1

Job ID: 160-52560-1

Eurofins St. Louis

CASE NARRATIVE

Client: Hastings Utilities

Project: WEC MW Sampling

Report Number: 160-52560-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

The matrix for the Method Blank and LCS/LCSD is as close to the samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

The method blank (MB) z-score is within limits, unless stated otherwise below, and is stored in the level IV raw data.

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.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

Receipt

The samples were received on 12/14/2023 11:15 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 10.7°C and 10.8°C

Method 903.0 - Radium-226 (GFPC)

Samples MW-01 (52560-1), MW-06 (52560-6), MW-07 (52560-7), MW-08 (52560-8), MW-09 (52560-9), MW-2B (52560-2), MW-3R (52560-3), MW-4B (52560-4) and MW-5B (52560-5) were analyzed for Radium-226 (GFPC). The samples were prepared on 12/15/2023 and analyzed on 1/12/2024.

The Ba Carrier recovery is outside the upper control limit (110%) for the following sample: MW-07 (160-52560-7). There was

Eurofins St. Louis

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 160-52560-1

Login Number: 52560

List Number: 1

Creator: Worthington, Sierra M

List Source: Eurofins St. Louis

5

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
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?	False	samplers name is not listed on the COC.
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Hastings Utilities

Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.
X	Carrier is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
a	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 Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Method	Method Description	Protocol	Laboratory
903.0	Radium-226 (GFPC)	EPA	EET SL
904.0	Radium-228 (GFPC)	EPA	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

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

Laboratory References:

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

Sample Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-52560-1	MW-01	Water	12/05/23 13:15	12/14/23 11:15
160-52560-2	MW-2B	Water	12/05/23 14:00	12/14/23 11:15
160-52560-3	MW-3R	Water	12/07/23 14:10	12/14/23 11:15
160-52560-4	MW-4B	Water	12/05/23 09:40	12/14/23 11:15
160-52560-5	MW-5B	Water	12/04/23 14:10	12/14/23 11:15
160-52560-6	MW-06	Water	12/04/23 15:55	12/14/23 11:15
160-52560-7	MW-07	Water	12/05/23 10:35	12/14/23 11:15
160-52560-8	MW-08	Water	12/05/23 14:25	12/14/23 11:15
160-52560-9	MW-09	Water	12/04/23 15:10	12/14/23 11:15

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Client Sample ID: MW-01

Lab Sample ID: 160-52560-1

Date Collected: 12/05/23 13:15

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.172	U	0.184	0.185	1.00	0.290	pCi/L	12/15/23 07:38	01/12/24 17:39	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		30 - 110					12/15/23 07:38	01/12/24 17:39	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.92		0.541	0.570	1.00	0.598	pCi/L	12/15/23 08:07	01/12/24 11:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.3		30 - 110					12/15/23 08:07	01/12/24 11:50	1
Y Carrier	79.3		30 - 110					12/15/23 08:07	01/12/24 11:50	1

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	2.10		0.571	0.599	5.00	0.598	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-2B

Lab Sample ID: 160-52560-2

Date Collected: 12/05/23 14:00

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.281	U	0.223	0.225	1.00	0.326	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		30 - 110					12/15/23 07:38	01/12/24 17:40	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.88		0.550	0.603	1.00	0.478	pCi/L	12/15/23 08:07	01/12/24 11:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.0		30 - 110					12/15/23 08:07	01/12/24 11:50	1
Y Carrier	81.5		30 - 110					12/15/23 08:07	01/12/24 11:50	1

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Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Client Sample ID: MW-2B

Lab Sample ID: 160-52560-2

Date Collected: 12/05/23 14:00

Matrix: Water

Date Received: 12/14/23 11:15

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	2.96		0.593	0.644	5.00	0.478	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-3R

Lab Sample ID: 160-52560-3

Date Collected: 12/07/23 14:10

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.261	U	0.285	0.286	1.00	0.461	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		30 - 110					12/15/23 07:38	01/12/24 17:40	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.83		0.511	0.538	1.00	0.576	pCi/L	12/15/23 08:07	01/12/24 11:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		30 - 110					12/15/23 08:07	01/12/24 11:50	1
Y Carrier	81.5		30 - 110					12/15/23 08:07	01/12/24 11:50	1

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	2.09		0.585	0.609	5.00	0.576	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-4B

Lab Sample ID: 160-52560-4

Date Collected: 12/05/23 09:40

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.222	U	0.204	0.205	1.00	0.309	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.3		30 - 110					12/15/23 07:38	01/12/24 17:40	1

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Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Client Sample ID: MW-4B

Lab Sample ID: 160-52560-4

Date Collected: 12/05/23 09:40

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.79		0.539	0.563	1.00	0.628	pCi/L	12/15/23 08:07	01/12/24 11:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.3		30 - 110					12/15/23 08:07	01/12/24 11:50	1
Y Carrier	82.6		30 - 110					12/15/23 08:07	01/12/24 11:50	1

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	2.01		0.576	0.599	5.00	0.628	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-5B

Lab Sample ID: 160-52560-5

Date Collected: 12/04/23 14:10

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.160	U	0.249	0.249	1.00	0.428	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.8		30 - 110					12/15/23 07:38	01/12/24 17:40	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.70		0.518	0.541	1.00	0.574	pCi/L	12/15/23 08:07	01/12/24 11:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.8		30 - 110					12/15/23 08:07	01/12/24 11:50	1
Y Carrier	79.3		30 - 110					12/15/23 08:07	01/12/24 11:50	1

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	1.86		0.575	0.596	5.00	0.574	pCi/L		01/15/24 17:35	1

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Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Client Sample ID: MW-06

Lab Sample ID: 160-52560-6

Date Collected: 12/04/23 15:55

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0806	U	0.174	0.174	1.00	0.316	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		30 - 110					12/15/23 07:38	01/12/24 17:40	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.17		0.476	0.488	1.00	0.625	pCi/L	12/15/23 08:07	01/12/24 11:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		30 - 110					12/15/23 08:07	01/12/24 11:51	1
Y Carrier	80.4		30 - 110					12/15/23 08:07	01/12/24 11:51	1

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	1.25		0.507	0.518	5.00	0.625	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-07

Lab Sample ID: 160-52560-7

Date Collected: 12/05/23 10:35

Matrix: Water

Date Received: 12/14/23 11:15

Method: EPA 903.0 - Radium-226 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.395		0.260	0.263	1.00	0.366	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	127	X	30 - 110					12/15/23 07:38	01/12/24 17:40	1

Method: EPA 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.00		0.330	0.342	1.00	0.395	pCi/L	12/15/23 08:07	01/12/24 11:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	127	X	30 - 110					12/15/23 08:07	01/12/24 11:51	1
Y Carrier	83.4		30 - 110					12/15/23 08:07	01/12/24 11:51	1

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Client Sample ID: MW-07
Date Collected: 12/05/23 10:35
Date Received: 12/14/23 11:15

Lab Sample ID: 160-52560-7
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	1.39		0.420	0.431	5.00	0.395	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-08
Date Collected: 12/05/23 14:25
Date Received: 12/14/23 11:15

Lab Sample ID: 160-52560-8
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.143	U	0.266	0.266	1.00	0.466	pCi/L	12/15/23 07:38	01/12/24 17:40	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed
Ba Carrier	84.6		30 - 110						12/15/23 07:38	01/12/24 17:40

Method: EPA 904.0 - Radium-228 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.582		0.376	0.380	1.00	0.551	pCi/L	12/15/23 08:07	01/12/24 11:51	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed
Ba Carrier	84.6		30 - 110						12/15/23 08:07	01/12/24 11:51
Y Carrier	83.4		30 - 110						12/15/23 08:07	01/12/24 11:51

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	0.725		0.461	0.464	5.00	0.551	pCi/L		01/15/24 17:35	1

Client Sample ID: MW-09
Date Collected: 12/04/23 15:10
Date Received: 12/14/23 11:15

Lab Sample ID: 160-52560-9
Matrix: Water

Method: EPA 903.0 - Radium-226 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.105	U	0.218	0.218	1.00	0.387	pCi/L	12/15/23 07:38	01/12/24 17:36	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed
Ba Carrier	91.5		30 - 110						12/15/23 07:38	01/12/24 17:36

Client Sample ID: MW-09
Date Collected: 12/04/23 15:10
Date Received: 12/14/23 11:15

Lab Sample ID: 160-52560-9
Matrix: Water

Method: EPA 904.0 - Radium-228 (GFPC)										
Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.17		0.550	0.585	1.00	0.591	pCi/L	12/15/23 08:07	01/12/24 11:51	1
Carrier	%Yield	Qualifier	Limits						Prepared	Analyzed
Ba Carrier	91.5		30 - 110						12/15/23 08:07	01/12/24 11:51
Y Carrier	80.7		30 - 110						12/15/23 08:07	01/12/24 11:51

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	2.27		0.592	0.624	5.00	0.591	pCi/L		01/15/24 17:35	1

QC Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Method: 903.0 - Radium-226 (GFPC)

Lab Sample ID: MB 160-640838/1-A
Matrix: Water
Analysis Batch: 644161

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 640838

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01519	U	0.170	0.170	1.00	0.338	pCi/L	12/15/23 07:38	01/12/24 17:38	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		30 - 110					12/15/23 07:38	01/12/24 17:38	1

Lab Sample ID: LCS 160-640838/2-A
Matrix: Water
Analysis Batch: 644161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 640838

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.46		1.35	1.00	0.338	pCi/L	92	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	95.0		30 - 110						

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-640841/1-A
Matrix: Water
Analysis Batch: 644161

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 640841

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2373	U	0.527	0.528	1.00	0.921	pCi/L	12/15/23 08:07	01/12/24 16:19	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.0		30 - 110					12/15/23 08:07	01/12/24 16:19	1
Y Carrier	84.5		30 - 110					12/15/23 08:07	01/12/24 16:19	1

Lab Sample ID: LCS 160-640841/2-A
Matrix: Water
Analysis Batch: 644161

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 640841

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-228	9.31	10.68		1.68	1.00	1.06	pCi/L	115	75 - 125
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	95.0		30 - 110						
Y Carrier	83.4		30 - 110						

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QC Association Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Rad

Prep Batch: 640838

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-52560-1	MW-01	Total/NA	Water	PrecSep-21	
160-52560-2	MW-2B	Total/NA	Water	PrecSep-21	
160-52560-3	MW-3R	Total/NA	Water	PrecSep-21	
160-52560-4	MW-4B	Total/NA	Water	PrecSep-21	
160-52560-5	MW-5B	Total/NA	Water	PrecSep-21	
160-52560-6	MW-06	Total/NA	Water	PrecSep-21	
160-52560-7	MW-07	Total/NA	Water	PrecSep-21	
160-52560-8	MW-08	Total/NA	Water	PrecSep-21	
160-52560-9	MW-09	Total/NA	Water	PrecSep-21	
MB 160-640838/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-640838/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 640841

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-52560-1	MW-01	Total/NA	Water	PrecSep_0	
160-52560-2	MW-2B	Total/NA	Water	PrecSep_0	
160-52560-3	MW-3R	Total/NA	Water	PrecSep_0	
160-52560-4	MW-4B	Total/NA	Water	PrecSep_0	
160-52560-5	MW-5B	Total/NA	Water	PrecSep_0	
160-52560-6	MW-06	Total/NA	Water	PrecSep_0	
160-52560-7	MW-07	Total/NA	Water	PrecSep_0	
160-52560-8	MW-08	Total/NA	Water	PrecSep_0	
160-52560-9	MW-09	Total/NA	Water	PrecSep_0	
MB 160-640841/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-640841/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

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Tracer/Carrier Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 160-52560-1

Method: 903.0 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	
160-52560-1	MW-01	85.3	
160-52560-2	MW-2B	92.0	
160-52560-3	MW-3R	92.3	
160-52560-4	MW-4B	84.3	
160-52560-5	MW-5B	81.8	
160-52560-6	MW-06	89.1	
160-52560-7	MW-07	127 X	
160-52560-8	MW-08	84.6	
160-52560-9	MW-09	91.5	
LCS 160-640838/2-A	Lab Control Sample	95.0	
MB 160-640838/1-A	Method Blank	93.0	
Tracer/Carrier Legend			
Ba = Ba Carrier			

Method: 904.0 - Radium-228 (GFPC)

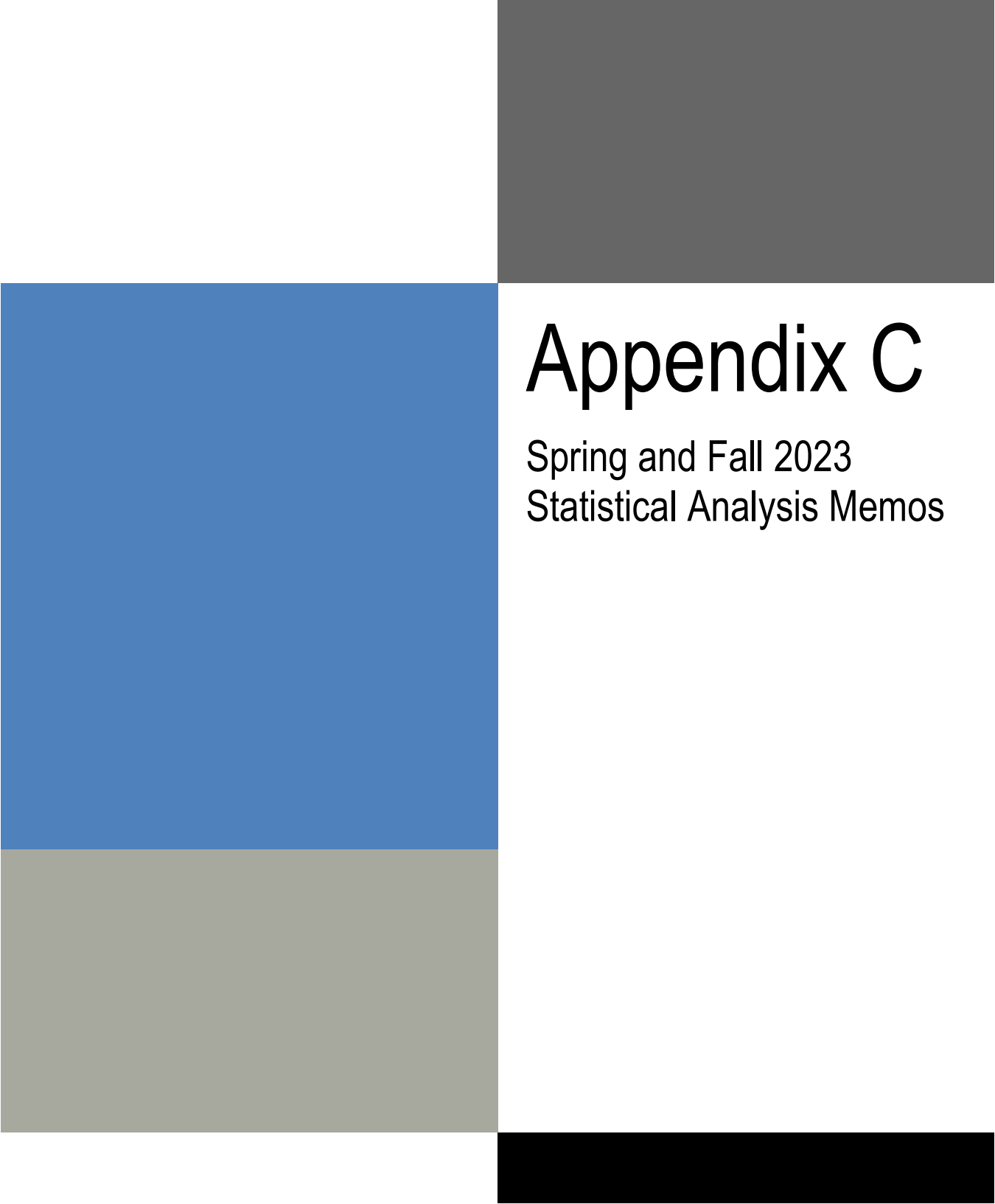
Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
160-52560-1	MW-01	85.3	79.3
160-52560-2	MW-2B	92.0	81.5
160-52560-3	MW-3R	92.3	81.5
160-52560-4	MW-4B	84.3	82.6
160-52560-5	MW-5B	81.8	79.3
160-52560-6	MW-06	89.1	80.4
160-52560-7	MW-07	127 X	83.4
160-52560-8	MW-08	84.6	83.4
160-52560-9	MW-09	91.5	80.7
LCS 160-640841/2-A	Lab Control Sample	95.0	83.4
MB 160-640841/1-A	Method Blank	93.0	84.5
Tracer/Carrier Legend			
Ba = Ba Carrier			
Y = Y Carrier			

Eurofins St. Louis

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Appendix C

Spring and Fall 2023
Statistical Analysis Memos

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Memo

Date: Thursday, June 29, 2023

To: Public Power Generation Agency (PPGA)

From: HDR Engineering, Inc.

Subject: Summary of Statistical Analysis and Evaluation for SSIs and SSLs – Spring 2023
WEC Temporary Ash Disposal Area
CCR Groundwater Monitoring Network

Whelan Energy Center (WEC), operated by Hastings Utilities, City of Hastings (Hastings), is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is currently an existing unlined CCR surface impoundment of approximately 23.2 acres and serves the two fossil fuel combustion units.

An assessment monitoring program, including groundwater sampling, was initiated for the WEC Temporary Ash Disposal Area in July 2018, as required by the CCR rule, within the 90-day period specified in 40 CFR §257.95 and Title 132 Chapter 7 Section 004.

The semiannual spring 2023 sampling event was analyzed for parameters in the Appendix III and Appendix IV list, as required by 40 CFR §257.95(b). The statistical analysis was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the WEC Temporary Ash Disposal Area, dated February 9, 2018, and the Title 132 Groundwater Sampling and Analysis Plan (SAP), dated August 6, 2021. Monitoring results used to calculate background threshold values (BTVs) were obtained during sampling events conducted between November 2016 and November 2022. Background data sets will be updated every two years or during a monitoring program transition, as recommended by the United States Environmental Protection Agency's (U.S. EPA) Unified Guidance, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (2009). The next BTV update will be conducted in fall 2024.

Downgradient sampling results from the spring 2023 assessment monitoring event were used to evaluate for SSIs over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs above BTVs for the Appendix III and Appendix IV constituents are provided in **Table D1**.

Table D1. Summary of Evaluation for SSIs over Background

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Constituent	BTV (UPL):	Unit	Assessment Monitoring Results in accordance with §257.95(b)(1) – April 2023					
Appendix III Constituents								
Boron	1.64	mg/L	1.05	0.530	0.674	0.764	0.942	1.19
Calcium	74.6	mg/L	35.8	81.1	70.0	51.3	44.7	35.2
Chloride	34.7	mg/L	31.2	28.4	31.7	27.8	28.9	26.2

Table D1. Summary of Evaluation for SSIs over Background

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Fluoride	1.50	mg/L	0.465J	<1.00	<1.00	<1.00	0.630J	0.949J
pH	6.20 – 7.47*	SU	6.70	6.86	6.62	6.55	6.64	7.12
Sulfate	198	mg/L	161	136	<u>201</u>	192	153	140
TDS	576	mg/L	364	424	460	388	364	326
Appendix IV Constituents								
Antimony	0.002	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	0.00628	mg/L	0.00430	0.00205	0.00244	0.00258	0.00351	0.00448
Barium	0.0613	mg/L	<u>0.0833</u>	<u>0.182</u>	<u>0.0639</u>	0.0441	0.0312	0.0471
Beryllium	0.001	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	0.0001	mg/L	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	0.0484	mg/L	0.0380	0.0179	0.00480J	0.00731	0.0166	0.0384
Cobalt	0.001	mg/L	0.000206J	<0.000500	<0.000500	0.000236J	<0.000500	<0.000500
Fluoride	1.50	mg/L	0.465J	<1.00	<1.00	<1.00	0.630J	0.949J
Lead	0.0207	mg/L	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	0.0171	mg/L	0.0140	0.0162	<u>0.0302</u>	<u>0.0322</u>	0.0164	0.0120
Mercury	0.0002	mg/L	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	0.0467	mg/L	0.0350	0.00240	0.00527	0.0104	0.0138	0.0336
Radium 226+228	2.03	pCi/L	0.83	0.466	0.595U	0.696	0.787	0.481U
Selenium	0.140	mg/L	0.0602	0.0369	0.0408	0.0273	0.0502	0.107
Thallium	0.001	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

Bold and underlined concentration indicates an SSI over background.

* Indicates the lower bound of the range which is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

“J” indicates that the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

“U” indicates that the result is less than the sample detection limit. The “U” qualifier is used for radium

The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table D2**. As shown in **Table D2**, no Appendix IV constituents were detected over the GWPS during the spring 2023 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring for the fall 2023 sampling event.

Table D2. Summary of Evaluation for SSLs over GWPS

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Constituent	GWPS ^[1]	Unit	Confidence Intervals in accordance with §257.95(d)(1)					
Antimony	0.006	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	0.01	mg/L	0.003689	0.002068	0.002305	0.002589	0.00346	0.003882
Barium	2.00	mg/L	0.07527	0.1697	0.07381	0.03337	0.05088	0.0419
Beryllium	0.004	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.005	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Chromium	0.1	mg/L	0.0296	0.01647	0.005957	0.005787	0.00956	0.03551
Cobalt	0.006	mg/L	0.000149	0.000374	0.0003	0.000236	0.00045	0.000227
Fluoride	4.00	mg/L	0.3073	0.3	0.29	0.2518	0.3527	0.7736
Lead	0.0207 ^[2]	mg/L	0.0005	0.0005	0.0005	0.00027	0.0005	0.000302



Table D2. Summary of Evaluation for SSLs over GWPS

	Well ID:		MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Lithium	0.04	mg/L	0.01115	0.01381	0.0274	0.02707	0.01363	0.01079
Mercury	0.002	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	0.100	mg/L	0.03492	0.002571	0.003829	0.005854	0.01911	0.04287
Radium 226+228	5.00	pCi/L	0.9627	1.211	0.9016	0.6338	0.9278	0.4827
Selenium	0.140 ^[2]	mg/L	0.0404	0.03469	0.03611	0.02694	0.04897	0.04635
Thallium	0.002	mg/L	0.001	0.001	0.001	0.001	0.001	0.001

^[1] GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2) unless specified otherwise.

^[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.

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Memo

Date: Friday, January 19, 2024

To: Public Power Generation Agency (PPGA)

From: HDR Engineering, Inc.

Subject: Summary of Statistical Analysis and Evaluation for SSIs and SSLs – Fall 2023
WEC Temporary Ash Disposal Area
CCR Groundwater Monitoring Network

Whelan Energy Center (WEC), operated by Hastings Utilities, City of Hastings (Hastings), is located at 4520 East South Street, Hastings, Adams County, Nebraska, approximately two miles east of the City of Hastings, Nebraska. WEC consists of two fossil fuel combustion units. WEC Unit No. 1 (WEC1) is owned and operated by Hastings. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA), of which Hastings is a member and acts as operating agent for PPGA. WEC Temporary Ash Disposal Area is an existing unlined CCR surface impoundment of approximately 23.2 acres serving the two fossil fuel combustion units. Approximately 6.1 acres of the WEC Temporary Ash Disposal Area was under construction for a composite liner (landfill cell and leachate pond) at the time of the fall 2023 sampling event.

An assessment monitoring program, including groundwater sampling, was initiated for the WEC Temporary Ash Disposal Area in July 2018, as required by the CCR rule, within the 90-day period specified in 40 CFR §257.95 and Title 132 Chapter 7 Section 004.

The semiannual fall 2023 sampling event was analyzed for parameters in the Appendix III and Appendix IV list, as required by 40 CFR §257.95(b). The statistical analysis was performed in accordance with the methods described in the *Groundwater Monitoring Statistical Certification* for the WEC Temporary Ash Disposal Area, dated February 9, 2018, and the Title 132 Groundwater Sampling and Analysis Plan (SAP), dated August 6, 2021. Monitoring results used to calculate background threshold values (BTVs) were obtained during sampling events conducted between November 2016 and November 2022. Background data sets will be updated every two years or during a monitoring program transition, as recommended by the United States Environmental Protection Agency's (U.S. EPA) Unified Guidance, "Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities" (2009). The next BTV update will be conducted in fall 2024.

Downgradient sampling results from the fall 2023 assessment monitoring event were used to evaluate for SSIs over background and statistically significant levels (SSLs) over the groundwater protection standard (GWPS). The calculated BTVs and the evaluation for SSIs above BTVs for the Appendix III and Appendix IV constituents are provided in **Table D1**.

Table D1. Summary of Evaluation for SSIs over Background

Well ID:		MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8	
Constituent	BTV (UPL):	Unit	Assessment Monitoring Results in accordance with §257.95(b)(1) – December 2023					
Appendix III Constituents								
Boron	1.64	mg/L	0.936	0.585	0.687	0.657	0.813	0.916
Calcium	74.6	mg/L	31.0	79.1	62.1	48.4	48.1	42.1
Chloride	34.7	mg/L	29.0	29.7	31.8	28.2	30.3	29.5
Fluoride	1.50	mg/L	0.447J	<1.00	<1.00	<1.00	0.649J	0.782J
pH	6.20 – 7.47*	SU	6.85	6.94	6.57	6.67	6.79	7.20
Sulfate	198	mg/L	150	146	214	177	172	165
TDS	576	mg/L	322	422	484	352	364	344
Appendix IV Constituents								
Antimony	0.002	mg/L	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200	<0.00200
Arsenic	0.00628	mg/L	0.00449	0.00225	0.00252	0.00258	0.00295	0.00371
Barium	0.0613	mg/L	0.0718	0.176	0.0642	0.0444	0.0347	0.0484
Beryllium	0.001	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	0.0001	mg/L	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Chromium	0.0484	mg/L	0.0173	0.0178	0.00334J	0.0122	0.0164	0.0330
Cobalt	0.001	mg/L	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Fluoride	1.50	mg/L	0.447J	<0.500	<0.500	<0.500	0.649J	0.782J
Lead	0.0207	mg/L	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	0.0171	mg/L	0.0102	0.0156	0.0361	0.0264	0.0149	0.0117
Mercury	0.0002	mg/L	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	0.0467	mg/L	0.0222	0.00242	0.00820	0.00110	0.0146	0.0252
Radium 226+228	2.03	pCi/L	2.10	2.96	0.00820	2.01	1.39	0.725
Selenium	0.140	mg/L	0.0413	0.0372	0.0216	0.0638	0.0540	0.0602
Thallium	0.001	mg/L	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100

Bold and underlined concentration indicates an SSI over background.

* Indicates the lower bound of the range which is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).

"J" indicates that the result is less than the laboratory reporting limit but greater than or equal to the method detection limit and the concentration is an approximate value.

The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in **Table D2**. As shown in **Table D2**, no Appendix IV constituents were detected over the GWPS during the fall 2023 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring for the spring 2024 sampling event.

Table D2. Summary of Evaluation for SSLs over GWPS

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Constituent	GWPS ^[1]	Unit	Confidence Intervals in accordance with §257.95(d)(1)					
Antimony	0.006	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Arsenic	0.01	mg/L	0.003719	0.002076	0.002314	0.002507	0.003432	0.003874
Barium	2.00	mg/L	0.0751	0.17	0.07328	0.0327	0.05	0.04216
Beryllium	0.004	mg/L	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	0.005	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002



Table D2. Summary of Evaluation for SSLs over GWPS

Well ID:			MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Chromium	0.1	mg/L	0.02975	0.01653	0.005375	0.00599	0.0145	0.03538
Cobalt	0.006	mg/L	0.000149	0.000374	0.0003	0.000236	0.00045	0.000227
Fluoride	4.00	mg/L	0.3131	0.30	0.299	0.2528	0.3629	0.807
Lead	0.0207 ^[2]	mg/L	0.0005	0.0005	0.0005	0.00027	0.0005	0.000302
Lithium	0.04	mg/L	0.01109	0.01392	0.0292	0.02702	0.0137	0.01084
Mercury	0.002	mg/L	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	0.100	mg/L	0.03408	0.002563	0.003944	0.006031	0.01887	0.04186
Radium 226+228	5.00	pCi/L	1.007	1.304	0.9427	0.6713	0.9507	0.4957
Selenium	0.140 ^[2]	mg/L	0.0404	0.03479	0.03567	0.02793	0.04829	0.04689
Thallium	0.002	mg/L	0.001	0.001	0.001	0.001	0.001	0.001

^[1] GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2) unless specified otherwise.

^[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.

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