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 29, 2021

This page intentionally left blank.

Professional Engineer Certification

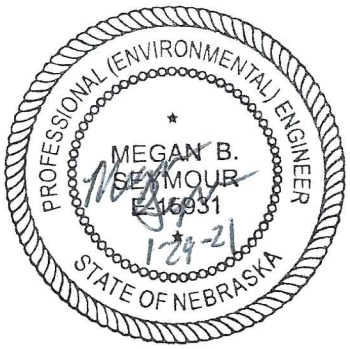
I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am duly licensed Professional Engineer under the laws of the Sate of Nebraska.

Print Name: Megan B. Seymour

Signature: Megan B Seym

Date: 1-29-2021

License #: E-15931



My license renewal date is December 31, 2022.

Table of Contents

Executive Summary 1

1 Introduction 3

1.1 Purpose 3
1.2 Facility Information 3
1.3 Transition of Monitoring Programs 4

2 Monitoring Program Summary 4

2.1 Groundwater Monitoring Network Condition Assessment 4
2.2 Groundwater Purging and Sampling 4
2.3 Groundwater Elevations & Flow Direction 5
2.4 Detection Monitoring Program Results 5
2.5 Assessment Monitoring Program Results 5
2.6 Statistical Analysis Results 6
2.7 Other Information Required under 40 CFR §257.90-98 6

4 Key Activities for Upcoming Year 6

List of Figures

Figure 1. WEC CCR Facilities and Monitoring Well Locations

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 2020 Statistical Analysis Memos

Executive Summary

City of Hastings Utilities (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 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 2020 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, a conceptual site model was prepared in 2019. Assessment monitoring continued for sampling events in spring and fall 2020. No transition of monitoring programs occurred in 2020.

For the May 2020 sampling event, results of the analysis indicated eleven (11) SSIs above background for Appendix III constituents and eight (8) SSIs above background for Appendix IV constituents.

- Calcium at MW-2B
- Calcium at MW-3R
- Chloride at MW-3R
- Fluoride at MW-8
- pH at MW-1
- pH at MW-2B
- pH at MW-3R
- Sulfate at MW-3R
- TDS at MW-3R
- Barium at MW-1
- Barium at MW-2B
- Barium at MW-3R
- Lithium at MW-3R
- Lithium at MW-4B

- pH at MW-4B
- pH at MW-7
- Molybdenum at MW-1
- Radium at MW-2B

Fluoride is included on both the Appendix III and Appendix IV constituent lists, so the SSI at MW-8 for fluoride is counted in the SSI list twice. SSIs for pH were due to a malfunctioning pH meter. The meter was replaced prior to the November 2020 sampling event, and the inaccurate pH values were marked as outliers for the fall 2020 statistical analysis.

For the November 2020 sampling event, results of the analysis indicated two (2) SSIs above background for Appendix III constituents and four (4) SSIs above background for Appendix IV constituents:

- Calcium at MW-2B
- Sulfate at MW-3R
- Antimony at MW-7
- Barium at MW-2B
- Cobalt at MW-3R
- Lithium at MW-3R

At the time this report was issued, the contracted laboratory had not yet returned results for radium. Once the radium data is received, the analytical results and updated statistical analysis for radium will be placed in the operating record and uploaded to the facility's CCR website. If there are any SSIs for radium, that will also be noted at that time.

There were no statistically significant levels (SSLs) of any constituents above the groundwater protection standards (GWPS) for either the May 2020 or November 2020 sampling events. Assessment monitoring will continue in spring and fall 2021.

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 the City of Hastings Utilities (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 2020.

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 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 City of Hastings Utilities. 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.

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 normally direct loaded into trucks for off-site beneficial use with limited sluicing to the WEC Temporary Ash Disposal Area. 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, a conceptual site model was completed in 2019. Assessment monitoring continued for sampling events in spring and fall 2020. No transition of monitoring programs occurred in 2020.

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 May 2020 and November 2020. During this time period, no repairs were required. The wells were noted in good working condition, concrete pads were intact, and no damage was observed to the protective well casings. No wells were added or abandoned from the certified monitoring well network in 2020.

2.2 Groundwater Purging and Sampling

Groundwater sampling events were conducted by Hastings Utilities personnel in May 2020 and November 2020 as the semiannual assessment monitoring events. 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 and revised on February 21, 2020. The monitoring wells were purged and sampled with dedicated Geotech SS Geosub pumps and controllers in the monitoring wells under low-flow sampling conditions. A calibrated water quality meter was used to monitor field parameters, including pH, temperature, and conductivity. Field sampling forms for the May 2020 and November 2020 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 TestAmerica. 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 2.195 ft/day to 3.351 ft/day, which is consistent with historical data observed from 2007 to 2019.

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 November 2020 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 2018 and October 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 continued in 2019 and 2020. 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. The results of the assessment monitoring events in May 2020 and November 2020 are presented in **Table 4** and **Table 5**. At the time this report was issued, the contracted laboratory had not yet returned results for radium. Once the radium data is received, the analytical results and updated statistical analysis for radium will be placed in the operating record and uploaded to the facility's CCR website. If there are any SSIs for radium, that will also be noted at that time.

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 2020. Background data sets will be updated every two years or during monitoring program transition, as recommended by the U.S. EPA's Unified Guidance (2009) and in accordance with the facility's SAP. 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 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.

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.

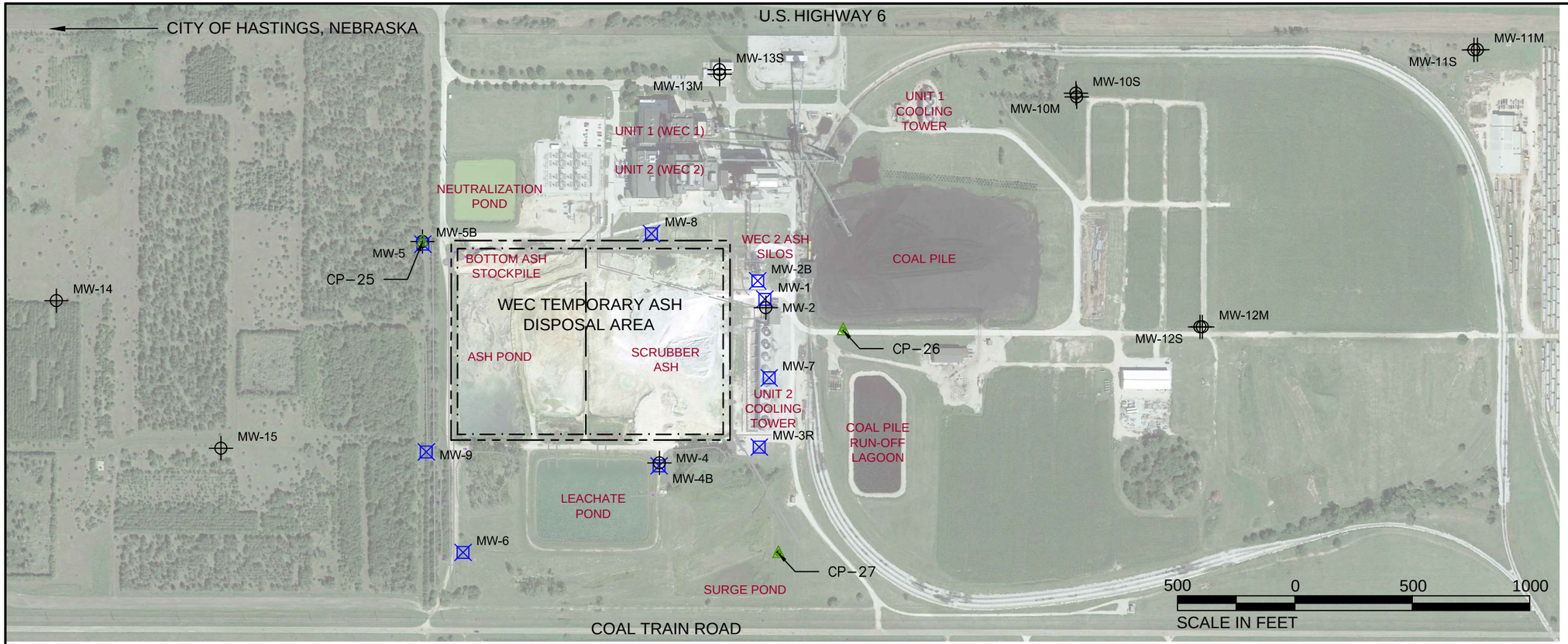
4 Key Activities for Upcoming Year

In 2021, all wells in the 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 2021. Results of the statistical analysis will be included in the 2021 Annual Groundwater Monitoring and Corrective Action Report.

Figures

This page intentionally left blank.

.



GROUNDWATER MONITORING WELLS

WELL DESIGNATION	NORTHING	EASTING	TOP OF CASING ELEVATION*	GROUND ELEVATION*	COMMENT
MW-1	334585.29	2330340.91	1903.16	1900.68	DETECTION MONITORING WELL
MW-2	334549.00	2330345.01	1903.18	1900.93	DRY
MW-2B	334663.85	2330310.77	1903.43	1900.60**	DETECTION MONITORING WELL
MW-3R	333955.95	2330316.80	1900.76	1897.98	DETECTION MONITORING WELL
MW-4	333888.31	2329891.68	1899.21	1895.19	DRY
MW-4B	333876.00	2329890.22	1897.55	1894.69**	DETECTION MONITORING WELL
MW-5	334830.77	2328882.44	1898.90	1897.60	DRY
MW-5B	334819.84	2328884.33	1899.84	1897.21**	DETECTION MONITORING WELL
MW-6	333507.64	2329055.42	1896.88	1893.54	DETECTION MONITORING WELL
MW-7	334250.89	2330359.26	1901.79	1899.14**	DETECTION MONITORING WELL
MW-8	334864.54	2329857.95	1903.93	1901.05**	DETECTION 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

* 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.

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.

public power generation agency

HASTINGS UTILITIES

GERALD T. WHALEN ENERGY CENTER

WEC CCR FACILITIES AND MONITORING WELL LOCATIONS

DATE
JANUARY 2021

FIGURE
1

C:\pwworking\central01\d1776388\Figure 2 - GW Monitoring Well Locations - Fall 2020.dwg, Plot, 1/4/2021 8:11:02 AM, WNICHOLSON

This page intentionally left blank.

Tables

This page intentionally left blank.

Table 1 - Groundwater Monitoring System
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

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-15	12/10/2018	140	140	130 - 140	Upgradient	1897.64

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.

This page intentionally left blank.

Table 2 - Groundwater Sampling Event Summary
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/19/2019, 2/17/2020, 5/6/2020, 11/18/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/15/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/2019, 2/17/2020, 5/6/2020, 11/16/2020
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	7	7/25/2018, 10/16/2018, 5/13/2019, 11/18/19, 2/17/2020, 5/6/2020, 11/16/2020

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.

This page intentionally left blank.

Table 3 - Groundwater Elevations
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

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

Notes:
TOC: Top of PVC well casing
N.M. = not measured
AMSL = above mean sea level

Table 3 - Groundwater Elevations
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

Investigative - Water Level Only Wells

	MW-10S		MW- 10M		MW-11S		MW-11M		MW-12S		MW-12M		MW-13S		MW-13M		MW-14		MW-15	
	TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation		TOC Elevation	
Historical TOC	1904.83		1905.08		1899.63		1899.63		1910.30		1910.06		1905.01		1905.07		1897.41		1897.65	
July 2019 TOC	1904.84		1905.18		1899.69		1899.66		1910.39		1910.15		1904.89		1905.04		1897.46		1897.64	
Date	**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**	**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**	**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	1767.34	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	1767.34	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

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

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

January 2021

		Appendix III Constituents						
	Constituent	**Boron**	**Calcium**	**Chloride**	**Fluoride***	**pH [1]**	**Sulfate**	**TDS**
	Reporting Unit	**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
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
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

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

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

January 2021

		Appendix III Constituents						
	Constituent	**Boron**	**Calcium**	**Chloride**	**Fluoride***	**pH [1]**	**Sulfate**	**TDS**
	Reporting Unit	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**
MW-3R	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
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
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
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

Table 4 - Appendix III Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

		Appendix III Constituents						
	Constituent	**Boron**	**Calcium**	**Chloride**	**Fluoride***	**pH [1]**	**Sulfate**	**TDS**
	Reporting Unit	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**
MW-6	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
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
MW-8	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
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

Table 4 - Appendix III Constituents in Groundwater

Groundwater Monitoring and Corrective Action Report

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

January 2021

		Appendix III Constituents						
	Constituent	**Boron**	**Calcium**	**Chloride**	**Fluoride***	**pH [1]**	**Sulfate**	**TDS**
	Reporting Unit	**mg/L**	**mg/L**	**mg/L**	**mg/L**	**S.U.**	**mg/L**	**mg/L**
MW-9	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

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 prior to the fall 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.

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

	Constituent	Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	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	Results Pending [4]	0.0297	<0.00100
MW-2B [2]	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
	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	Results Pending [4]	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	0.30	< 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	0.30	< 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

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

	Constituent	Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	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-3R	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	Results Pending [4]	0.0351	<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
	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	Results Pending [4]	0.0372	<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

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

	Constituent	Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	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-5B	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	Results Pending [4]	0.0938	<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
	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	Results Pending [4]	0.0601	<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	Results Pending [4]	0.0381	<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

Table 5 - Appendix IV Constituents in Groundwater
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

	Constituent	Appendix IV Constituents														
		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Fluoride*	Lead	Lithium	Mercury	Molybdenum	Combined Radium (Ra 226 + Ra 228)	Selenium	Thallium
	Reporting Unit	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-8	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	Results Pending [4]	0.0408	<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	< 0.0005	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
	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	Results Pending [4]	0.0751	<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] The contracted laboratory had not returned the radium results at the time that this report was issued. The radium results will be submitted as an addendum.

* 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 2021

Constituents	Units	Background Threshold Values (UPLs) - 2020 [1]
Appendix III		
Boron	mg/l	1.71
Calcium	mg/l	78.8
Chloride	mg/l	35.2
Fluoride*	mg/l	1.59
pH (LPL)**	SU	6.15
pH (UPL)***	SU	7.53
Sulfate	mg/l	199
TDS	mg/l	591
Appendix IV		
Antimony	mg/l	0.001
Arsenic	mg/l	0.00666
Barium	mg/l	0.0858
Beryllium	mg/l	0.001
Cadmium	mg/l	0.0001
Chromium	mg/l	0.0514
Cobalt	mg/l	0.0005
Lead	mg/l	0.0207
Lithium	mg/l	0.0175
Mercury	mg/l	0.0002
Molybdenum	mg/l	0.0489
Radium 226 + 228[2]	pCi/l	2.03
Selenium	mg/l	0.158
Thallium	mg/l	0.001

Notes:

[1] BTVs were updated in fall 2020.

* 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).

This page intentionally left blank.

Table 7 - Established Groundwater Protection Standards
Groundwater Monitoring and Corrective Action Report
Whelan Energy Center - Public Power Generation Agency (PPGA) / Hastings Utilities
January 2021

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	0.158[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).

This page intentionally left blank.

Appendix A

Field Sampling Forms

This page intentionally left blank.

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-1	Weather (CLR) P.CLDY CLDY FOG	Prepared By: Sidlo
Sample Media: Groundwater	Temp 60 °F Wind (Calm) Mod High	Personnel:
Sample Date: 5/6/20	Precip Rain ~~Lite~~ ~~Mod~~ ~~High~~ Snow ~~Lite~~ ~~Mod~~ ~~High~~	Sample Time: 18:00

Purging Information

Date: ___/___/___	Time Started: 17:30	Time Completed: 18:05
Method: Electric 12V DC Sampling Pump		
Water Level: 124.23	Purge Rate:	

Water Quality Parameters During Purging

sal.

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ (g/L)	ORP (mV)
17:50		5.34	0.460		0.27	14.36	0.28	
17:53		5.36	0.460		0.27	14.36	0.28	
17:56		5.34	0.460		0.27	14.33	0.28	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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)	Field Blank ~~Duplicate~~ Collected: (YES) / NO If yes, Sample ID FB-2B
Sample No: MW-2B	Weather (CLR) P.CLDY CLDY FOG Temp (60) °F Wind (Calm) Mod High Precip ~~Rain Lite Mod High~~ Snow ~~Lite Mod High~~	Prepared By: Sidlo
Sample Media: Groundwater		Personnel:
Sample Date: 5/6/20		Sample Time: 18:40

5-6-20
18:42

Purging Information

Date: ___/___/___	Time Started: 18:10	Time Completed: 18:45
Method: Electric 12V DC Sampling Pump		
Water Level: 133.40	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal (g/L)	ORP (mV)
18:30		5.15	0.561		0.29	14.42	0.34	
18:33		5.15	0.561		0.28	14:47	0.34	
18:36		5.15	0.561		0.28	14.49	0.34	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-3R	**Weather** CLR P.CLDY CLDY FOG	Prepared By: Sidlo
Sample Media: Groundwater	**Temp** 60 F **Wind** Calm Mod High	Personnel:
Sample Date: 5/6/20	**Precip** ~~Rain- Lite Mod High~~ ~~Snow- Lite Mod High~~	Sample Time: 16:40

Purging Information

Date: ___/___/___	Time Started: 16:10	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 121.44	Purge Rate:	

Water Quality Parameters During Purging

Sal

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ (g/L)	ORP (mV)
16:30		5.55	0.716		0.30	15.29	0.44	
16:33		5.55	0.721		0.30	15.21	0.44	
16:36		5.53	0.710		0.30	15.25	0.43	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-4B	Weather (CLR) P.CLDY CLDY FOG	Prepared By: Sidlo
Sample Media: Groundwater	Temp 62 °F Wind Calm (Mod) High	Personnel:
Sample Date: 5/6/20	Precip ~~Rain Lite Mod High~~ ~~Snow Lite Mod High~~	Sample Time: 16:00

Purging Information

Date: __/__/__	Time Started: 15:35	Time Completed: 16:05
Method: Electric 12V DC Sampling Pump		
Water Level: 115.92	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal. (g/L)	ORP (mV)
15:50		5.27	0.464		0.26	13.90	0.29	
15:53		5.25	0.460		0.26	13.83	0.29	
15:56		5.24	0.461		0.26	13.78	028	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-5B	Weather (CLR) P.CLDY CLDY FOG	Prepared By: Sdlo
Sample Media: Groundwater	Temp 50 °F Wind Calm (Mod) High	Personnel:
Sample Date: 5/6/20	Precip ~~Rain Lite Mod High~~ ~~Snow Lite Mod High~~	Sample Time: 12:30

Purging Information

Date: ___/___/___	Time Started: 12:05	Time Completed: 12:35
Method: Electric 12V DC Sampling Pump		
Water Level: 117.00	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal. (g/L)	ORP (mV)
12:20		5.97	0.487		0.33	13.37	0.31	
12:23		5.92	0.487		0.32	13.41	0.32	
12:26		5.88	0.488		0.33	13.43	0.33	
12:28		5.86	0.488		0.33	13.42	~~0.33~~ 0.31	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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:

MW-5 9- 116.27

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-6	**Weather** CLR (P.CLDY) CLDY FOG	Prepared By: Sidlo
Sample Media: Groundwater	**Temp** 58 °F **Wind** Calm Mod High	Personnel:
Sample Date: 5/6/20	**Precip** Rain- Lite Mod High Snow- Lite Mod High	Sample Time: 14:00

Purging Information

Date: __/__/__	Time Started: 13:25	Time Completed: 14:05
Method: Electric 12V DC Sampling Pump		
Water Level: 113.45	Purge Rate:	

Water Quality Parameters During Purging

Sal.

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ (g/L)	ORP (mV)
13:50		6.15	0.481		0.37	15.07	0.29	
13:53		6.15	0.480		0.37	15.06	0.29	
13:55		6.14	0.480		0.37	15.05	0.29	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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 MW-107
Sample No: MW-7	Weather (CLR) P.CLDY CLDY FOG Temp 60 °F Wind Calm (Mod) High Precip Rain- Lite Mod High Snow- Lite Mod High	Prepared By: Sidlo
Sample Media: Groundwater		Personnel:
Sample Date: 5/6/20		Sample Time: 17:20

5/6/20
11:00

Purging Information

Date: __/__/__	Time Started: 16:50	Time Completed: 17:25
Method: Electric 12V DC Sampling Pump		
Water Level: 122.37	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal. (g/L)	ORP (mV)
17:10		5.17	0.499		0.26	13.73	0.31	
17:13		5.17	0.503		0.26	13.72	0.31	
17:16		5.17	0.499		0.26	13.70	0.31	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-8	**Weather** CLR P.CLDY (CLDY) FOG	Prepared By: Sidlo
Sample Media: Groundwater	**Temp** 48 °F **Wind** Calm (Mod) High	Personnel:
Sample Date: 5/7/20	**Precip** ~~Rain- Lite Mod High~~ ~~Snow- Lite Mod High~~	Sample Time: 1015

Purging Information

Date: ___/___/___	Time Started: 9:47	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 123.05	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal (g/L)	ORP (mV)
10:07		6.58	0.422		0.30	14.61	0.26	
10:10		6.58	0.423		0.30	14.60	0.26	
10:13		6.57	0.421		0.30	14.59	0.26	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-9	Weather (CLR) P.CLDY CLDY FOG	Prepared By:
Sample Media: Groundwater	Temp 58 °F Wind Calm (Mod) High	Personnel:
Sample Date: 5/6/20	Precip ~~Rain Lite Mod High~~ Snow- Lite Mod High	Sample Time: 13:15

Purging Information

Date: __/__/__	Time Started: 12:45	Time Completed: 13:20
Method: Electric 12V DC Sampling Pump		
Water Level: 112.85	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	~~TDS~~ Sal (g/L)	ORP (mV)
13:05		5.40	0.367		0.36	11.46	0.24	
13:08		5.36	0.367		0.36	11.47	0.24	
13:11		5.35	0.367		0.36	11.47	0.24	
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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~~ Field Blank Collected: YES / NO If yes, Sample ID MW-01FB
Sample No: MW-01	**Weather** CLR P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 60 °F **Wind** Calm Mod High	Personnel:
Sample Date: 11/16/20	**Precip** ~~Rain- Lite Mod High~~ Snow- Lite Mod High	Sample Time: 16:40

11-16-20 16:42

Purging Information

Date: ___/___/___	Time Started: 16:10	Time Completed: 16:45
Method: Electric 12V DC Sampling Pump		
Water Level: 125.24	Purge Rate:	

Water Quality Parameters During Purging

SPC

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)
16:30		6.88	508.0	1.99	8.00	14.7		109.2
16:33		6.83	507.2	2.31	7.97	14.7		110.7
16:36		6.83	507.6	2.43	7.97	14.7		111.7
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-750 to 750

C mS/cm
.405
.407
.406

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 MW-2B
Sample No: MW-2B	Weather CLR P.CLDY CLDY FOG	Prepared By:
Sample Media: Groundwater	Temp 60 °F Wind Calm Mod High	Personnel:
Sample Date: 11/18/20	Precip Rain- Lite Mod High Snow- Lite Mod High	Sample Time: 13:45

11-18-20 8:30

Purging Information

Date: ___/___/___	Time Started: 13:20	Time Completed:
Method: Electric 12V DC Sampling Pump		
Water Level: 136.10	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)
13:40		6.96	6.99	1.47	6.89	14.8		166.7
13:42		6.95	6.94	1.66	6.97	14.8		166.2
13:44		6.95	6.95	1.74	6.99	14.8		165.6
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-750 to 750

C (mS/cm)
0.56
0.56
0.55

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:

Set pump at 160'

Groundwater Monitoring Sampling Collection Field Log

Project: WEC MW Sampling Hastings, NE	(Circle One) Monthly Quarterly	Duplicate Collected: YES / NO If yes, Sample ID MW-103
Sample No: MW-3R	**Weather** CLR P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 60 °F **Wind** Calm Mod High	Personnel:
Sample Date: 11/16/20	**Precip** Rain- ~~Lite~~ Mod ~~High~~ Snow- ~~Lite~~ Mod ~~High~~	Sample Time: 15:15

11-16-20
10:50

Purging Information

Date: ___/___/___	Time Started: 14:45	Time Completed: 15:20
Method: Electric 12V DC Sampling Pump		
Water Level: 122.20	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)
15:05		6.61	771	3.59	6.40	16.3		83.5
15:08		6.58	774	3.31	6.36	16.4		83.5
15:11		6.58	772	3.35	6.33	16.4		83.4
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-750 to 750

SPC uS/cm

C mS/cm
0.64
0.65
0.65

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-4B	**Weather** (CLR) P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 58°F **Wind** (Calm) Mod High	Personnel:
Sample Date: 11/16/20	**Precip** Rain- ~~Lite~~ ~~Mod~~ ~~High~~ Snow- Lite Mod High	Sample Time: 14:20

Purging Information

Date: ___/___/___	Time Started: 13:52	Time Completed: 14:25
Method: Electric 12V DC Sampling Pump		
Water Level: 116.23	Purge Rate:	

Water Quality Parameters During Purging

SPC uS/cm

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)	C mS/cm
14:12		6.78	562.0	1.45	6.74	13.4		116.4	0.437
14:15		6.80	562.9	1.71	6.81	13.4		115.7	0.438
14:18		6.79	562.7	1.96	6.77	13.4		115.2	0.437
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350	
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-5B	**Weather** (CLR) P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 54 °F **Wind** (Calm) Mod High	Personnel:
Sample Date: 11/16/20	**Precip** ~~Rain~~ ~~Lite~~ ~~Mod~~ ~~High~~ **Snow**~~Lite~~ ~~Mod~~ ~~High~~	Sample Time: 12:10

Purging Information

Date: ___/___/___	Time Started: 11:40	Time Completed: 12:15
Method: Electric 12V DC Sampling Pump		
Water Level: 117.60	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)	Cond mS/cm
12:00		7.25	554.0	2.22	10.95	13.1	~~34~~	220.8	0.434
12:03		7.29	554.7	1.63	10.75	13.2		219.0	0.432
12:06		7.30	556.4	1.61	11.16	13.2		215.7	0.432
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350	
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-6	**Weather** (CLR) P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 58 °F **Wind** (Calm) Mod High	Personnel:
Sample Date: 11/16/20	**Precip** ~~Rain Lite Mod High~~ ~~Snow Lite Mod High~~	Sample Time: 13:30

Purging Information

Date: ___/___/___	Time Started: 13:00	Time Completed: 13:35
Method: Electric 12V DC Sampling Pump		
Water Level: 112.90	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)
13:20		6.85	597.7	0.97	9.35	13.2		145.6
13:23		6.86	596.1	1.20	9.30	13.3		148.5
13:26		6.82	597.4	1.73	9.29	13.3		148.8
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-750 to 750

SPC µS/cm

C mS/cm
0.464
0.462
0.461

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-7	**Weather** CLR P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 40 °F **Wind** Calm Mod High	Personnel:
Sample Date: 11/16/20	**Precip** Rain- Lite Mod High Snow- Lite Mod High	Sample Time: 16:00

Purging Information

Date: ___/___/___	Time Started: 15:30	Time Completed: 16:05
Method: Electric 12V DC Sampling Pump		
Water Level: 123.20	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m) SPC mS/cm	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)	C mS/cm
15:50		6.77	554.7	1.98	7.64	13.5	1	159.6	0.433
15:53		6.76	554.9	2.14	7.64	13.5		160.2	0.433
15:56		6.75	554.3	2.00	7.63	13.5		160.9	0.432
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350	
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-08	**Weather** (CLR) P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	**Temp** 56 °F **Wind** Calm (Mod) High	Personnel:
Sample Date: 11/16/20	**Precip** Rain- Lite Mod High Snow- Lite Mod High	Sample Time: 17:20

Purging Information

Date: ___/___/___	Time Started: 16:50	Time Completed: 17:25
Method: Electric 12V DC Sampling Pump		
Water Level: 123.95	Purge Rate:	

Water Quality Parameters During Purging

SPC

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)	C mg/cm
17:10		7.26	543.3	1.50	7.48	14.3		142.4	0.434
17:13		7.25	543.6	1.67	7.44	14.3		142.8	0.433
17:16		7.25	544.5	2.06	7.45	14.3		142.7	0.432
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350	
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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-9	Weather CLR P.CLDY CLDY FOG	Prepared By: J. Sidlo
Sample Media: Groundwater	Temp 50 °F Wind Calm Mod High	Personnel:
Sample Date: 11/16/20	Precip ~~Rain Lite Mod High~~ Snow- Lite Mod High	Sample Time: 12:50

Purging Information

Date: ___/___/___	Time Started: 12:20	Time Completed: 12:55
Method: Electric 12V DC Sampling Pump		
Water Level: 110.95	Purge Rate:	

Water Quality Parameters During Purging

Time	Volume Purged	*pH (m/V)	*Cond. (S/m)	Turbidity (NTU)	DO (mg/L)	*Temp (°C)	TDS (g/L)	ORP (mV)	~~SPC~~ EC mS/cm
12:40		7.15	486.5	1.40	7.57	18.8		106.4	0.430
12:43		7.14	486.9	1.50	7.53	18.8		107.2	0.428
12:46		7.14	486.3	1.42	7.53	18.8		107.7	0.430
Expected Range		6 to 8.5	0 to 100	0 to 5	4 to 10	10 to 20	0 to 500	-350 to 350	
Physical Range		0 to 14	0 to 10000	0 to 10000	0 to 20	0 to 100	0 to 10000	-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:

Flow cell was sitting in direct sunlight thus the higher temp.

Appendix B

Analytical Laboratory Reports

This page intentionally left blank.

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-181620-1
Client Project/Site: WEC MW Sampling

For:
Hastings Utilities
1228 N. Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Attn: Jenny Sidlo

Authorized for release by:
5/26/2020 1:37:47 PM

Shirley Thompson, Senior Project Manager
(319)277-2401
shirley.thompson@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Case Narrative 3
Sample Summary 4
Detection Summary 5
Client Sample Results 9
Definitions 20
QC Sample Results 21
QC Association 25
Chronicle 28
Certification Summary 32
Method Summary 33
Chain of Custody 34
Receipt Checklists 36

Job ID: 310-181620-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-181620-1

Comments
No additional comments.

Receipt
The samples were received on 5/13/2020 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

HPLC/IC
Method 9056A: The following sample was diluted due to the nature of the sample matrix: MW-3R (310-181620-3). 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 analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

Job ID: 310-181620-2

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-181620-2

Comments
No additional comments.

Receipt
The samples were received on 5/13/2020 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

HPLC/IC
Method 9056A: The following samples were received outside of holding time: MW-2B (310-181620-2), MW-3R (310-181620-3), MW-4B (310-181620-4), MW-5B (310-181620-5), MW-6 (310-181620-6), MW-7 (310-181620-7), MW-8 (310-181620-8), MW-9 (310-181620-9), MW-107 (310-181620-10) and FB-2B (310-181620-11).

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

Sample Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-181620-1	MW-1	Water	05/06/20 18:00	05/13/20 09:10	
310-181620-2	MW-2B	Water	05/06/20 18:40	05/13/20 09:10	
310-181620-3	MW-3R	Water	05/06/20 16:40	05/13/20 09:10	
310-181620-4	MW-4B	Water	05/06/20 16:00	05/13/20 09:10	
310-181620-5	MW-5B	Water	05/06/20 12:30	05/13/20 09:10	
310-181620-6	MW-6	Water	05/06/20 14:00	05/13/20 09:10	
310-181620-7	MW-7	Water	05/06/20 17:20	05/13/20 09:10	
310-181620-8	MW-8	Water	05/07/20 10:15	05/13/20 09:10	
310-181620-9	MW-9	Water	05/06/20 13:15	05/13/20 09:10	
310-181620-10	MW-107	Water	05/06/20 11:00	05/13/20 09:10	
310-181620-11	FB-2B	Water	05/06/20 18:42	05/13/20 09:10	

Detection Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-1 — Lab Sample ID: 310-181620-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.7		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	9.47	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.587		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	158		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00459		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0770		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.35		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	36.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0327		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000119	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Lithium	0.0107		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0441		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0668		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	390		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2B — Lab Sample ID: 310-181620-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.1		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.49	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.534		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	149		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00237		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.193		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	0.600		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	86.8		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0183		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000347	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Iron	0.224		0.100	0.0500	mg/L	1		6020A	Total/NA
Lithium	0.0145		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.00356		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0363		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	472		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-3R — Lab Sample ID: 310-181620-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	34.8		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	6.13	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.401	J	0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	278		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00239		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0905		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	0.971		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	90.8		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0100		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000188	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Iron	0.259		0.100	0.0500	mg/L	1		6020A	Total/NA
Lithium	0.0306		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.00593		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0606		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	622		30.0	26.0	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: 310-181620-1

Client Sample ID: MW-4B — Lab Sample ID: 310-181620-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.7		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	7.73	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.665		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	156		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00286		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0349		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	0.990		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	45.3		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0216		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0228		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0188		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0416		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	396		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-5B — Lab Sample ID: 310-181620-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	20.0		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	11.2	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	1.41		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	172		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00381		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0496		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.54		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	48.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0500		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000420	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Lithium	0.0115		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0635		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.182		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	440		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 310-181620-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.5		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.03	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.635		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	146		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00259		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0512		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.10		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	55.7		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0229		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0114		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.00831		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.135		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	404		30.0	26.0	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: 310-181620-1

Client Sample ID: MW-7 — Lab Sample ID: 310-181620-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	27.2		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	7.96	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.517		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	145		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00415		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0407		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.47		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	39.5		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0264		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.0000910	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Lithium	0.00936	J	0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0255		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0421		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	450		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-8 — Lab Sample ID: 310-181620-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.3		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	10.0	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	1.36		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	140		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00400		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0358		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.22		0.100	0.0730	mg/L	1		6020A	Total/NA
Cadmium	0.0000880	J	0.000100	0.0000390	mg/L	1		6020A	Total/NA
Calcium	32.3		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0380		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000102	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Lead	0.000302	J	0.000500	0.000270	mg/L	1		6020A	Total/NA
Lithium	0.00837	J	0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0371		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0293		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	348		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-9 — Lab Sample ID: 310-181620-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25.4		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	9.87	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.992		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	126		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00209		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0473		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	0.750		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	33.4		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0298		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.00670	J	0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0182		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0363		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	328		30.0	26.0	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: 310-181620-1

Client Sample ID: MW-107 — Lab Sample ID: 310-181620-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	29.2		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.67	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.942		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	187		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00441		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0416		0.00200	0.000900	mg/L	1		6020A	Total/NA
Boron	1.48		0.100	0.0730	mg/L	1		6020A	Total/NA
Calcium	41.0		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0271		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0105		0.0100	0.00230	mg/L	1		6020A	Total/NA
Molybdenum	0.0261		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0434		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	448		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: FB-2B — Lab Sample ID: 310-181620-11

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-1

Date Collected: 05/06/20 18:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-1

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.7**		5.00	2.00	mg/L			05/14/20 19:08	5
Nitrate as N	**9.47**	**H H3**	0.500	0.245	mg/L			05/14/20 19:08	5
Fluoride	**0.587**		0.500	0.230	mg/L			05/14/20 19:08	5
Sulfate	**158**		5.00	3.55	mg/L			05/14/20 19:08	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:40	1
Arsenic	**0.00459**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:40	1
Barium	**0.0770**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:40	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:40	1
Boron	**1.35**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:40	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:40	1
Calcium	**36.2**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:40	1
Chromium	**0.0327**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:40	1
Cobalt	**0.000119**	**J**	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:40	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:40	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:40	1
Lithium	**0.0107**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:40	1
Molybdenum	**0.0441**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:40	1
Selenium	**0.0668**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:40	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:40	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:10	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**390**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample ID: MW-2B

Date Collected: 05/06/20 18:40
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-2

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27.1**		5.00	2.00	mg/L			05/14/20 20:26	5
Nitrate as N	**8.49**	**H H3**	0.500	0.245	mg/L			05/14/20 20:26	5
Fluoride	**0.534**		0.500	0.230	mg/L			05/14/20 20:26	5
Sulfate	**149**		5.00	3.55	mg/L			05/14/20 20:26	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:42	1
Arsenic	**0.00237**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:42	1
Barium	**0.193**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:42	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:42	1
Boron	**0.600**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:42	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:42	1
Calcium	**86.8**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:42	1
Chromium	**0.0183**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:42	1
Cobalt	**0.000347**	**J**	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:42	1
Iron	**0.224**		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:42	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:42	1
Lithium	**0.0145**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:42	1
Molybdenum	**0.00356**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:42	1
Selenium	**0.0363**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:42	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:42	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:12	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**472**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample Results

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-3R

Date Collected: 05/06/20 16:40
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-3

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**34.8**		5.00	2.00	mg/L			05/14/20 20:41	5
Nitrate as N	**6.13**	**H H3**	0.500	0.245	mg/L			05/14/20 20:41	5
Fluoride	**0.401**	**J**	0.500	0.230	mg/L			05/14/20 20:41	5
Sulfate	**278**		5.00	3.55	mg/L			05/14/20 20:41	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:45	1
Arsenic	**0.00239**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:45	1
Barium	**0.0905**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:45	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:45	1
Boron	**0.971**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:45	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:45	1
Calcium	**90.8**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:45	1
Chromium	**0.0100**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:45	1
Cobalt	**0.000188**	**J**	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:45	1
Iron	**0.259**		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:45	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:45	1
Lithium	**0.0306**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:45	1
Molybdenum	**0.00593**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:45	1
Selenium	**0.0606**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:45	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:45	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:18	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**622**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample ID: MW-4B

Date Collected: 05/06/20 16:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-4

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.7**		5.00	2.00	mg/L			05/14/20 20:57	5
Nitrate as N	**7.73**	**H H3**	0.500	0.245	mg/L			05/14/20 20:57	5
Fluoride	**0.665**		0.500	0.230	mg/L			05/14/20 20:57	5
Sulfate	**156**		5.00	3.55	mg/L			05/14/20 20:57	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:50	1
Arsenic	**0.00286**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:50	1
Barium	**0.0349**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:50	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:50	1
Boron	**0.990**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:50	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:50	1
Calcium	**45.3**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:50	1
Chromium	**0.0216**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:50	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:50	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:50	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:50	1
Lithium	**0.0228**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:50	1
Molybdenum	**0.0188**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:50	1
Selenium	**0.0416**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:50	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:50	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:20	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**396**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample ID: MW-5B
Date Collected: 05/06/20 12:30
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-5
Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**20.0**		5.00	2.00	mg/L			05/14/20 21:13	5
Nitrate as N	**11.2**	**H H3**	0.500	0.245	mg/L			05/14/20 21:13	5
Fluoride	**1.41**		0.500	0.230	mg/L			05/14/20 21:13	5
Sulfate	**172**		5.00	3.55	mg/L			05/14/20 21:13	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:53	1
Arsenic	**0.00381**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:53	1
Barium	**0.0496**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:53	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:53	1
Boron	**1.54**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:53	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:53	1
Calcium	**48.2**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:53	1
Chromium	**0.0500**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:53	1
Cobalt	**0.000420**	**J**	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:53	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:53	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:53	1
Lithium	**0.0115**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:53	1
Molybdenum	**0.0635**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:53	1
Selenium	**0.182**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:53	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:53	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:23	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**440**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample ID: MW-6

Date Collected: 05/06/20 14:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-6

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27.5**		5.00	2.00	mg/L			05/14/20 21:28	5
Nitrate as N	**8.03**	**H H3**	0.500	0.245	mg/L			05/14/20 21:28	5
Fluoride	**0.635**		0.500	0.230	mg/L			05/14/20 21:28	5
Sulfate	**146**		5.00	3.55	mg/L			05/14/20 21:28	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 16:56	1
Arsenic	**0.00259**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 16:56	1
Barium	**0.0512**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 16:56	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 16:56	1
Boron	**1.10**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 16:56	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 16:56	1
Calcium	**55.7**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 16:56	1
Chromium	**0.0229**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 16:56	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 16:56	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 16:56	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 16:56	1
Lithium	**0.0114**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 16:56	1
Molybdenum	**0.00831**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 16:56	1
Selenium	**0.135**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 16:56	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 16:56	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:25	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**404**		30.0	26.0	mg/L			05/13/20 14:40	1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-7

Date Collected: 05/06/20 17:20
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-7

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**27.2**		5.00	2.00	mg/L			05/14/20 21:44	5
Nitrate as N	**7.96**	**H H3**	0.500	0.245	mg/L			05/14/20 21:44	5
Fluoride	**0.517**		0.500	0.230	mg/L			05/14/20 21:44	5
Sulfate	**145**		5.00	3.55	mg/L			05/14/20 21:44	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 17:06	1
Arsenic	**0.00415**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 17:06	1
Barium	**0.0407**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 17:06	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 17:06	1
Boron	**1.47**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 17:06	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 17:06	1
Calcium	**39.5**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 17:06	1
Chromium	**0.0264**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 17:06	1
Cobalt	**0.0000910**	**J**	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 17:06	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 17:06	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 17:06	1
Lithium	**0.00936**	**J**	0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 17:06	1
Molybdenum	**0.0255**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 17:06	1
Selenium	**0.0421**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 17:06	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 17:06	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**450**		30.0	26.0	mg/L			05/13/20 14:40	1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-8

Date Collected: 05/07/20 10:15
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-8

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	26.3		5.00	2.00	mg/L			05/14/20 21:59	5
Nitrate as N	10.0	H H3	0.500	0.245	mg/L			05/14/20 21:59	5
Fluoride	1.36		0.500	0.230	mg/L			05/14/20 21:59	5
Sulfate	140		5.00	3.55	mg/L			05/14/20 21:59	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 17:09	1
Arsenic	0.00400		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 17:09	1
Barium	0.0358		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 17:09	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 17:09	1
Boron	1.22		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 17:09	1
Cadmium	0.0000880	J	0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 17:09	1
Calcium	32.3		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 17:09	1
Chromium	0.0380		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 17:09	1
Cobalt	0.000102	J	0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 17:09	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 17:09	1
Lead	0.000302	J	0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 17:09	1
Lithium	0.00837	J	0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 17:09	1
Molybdenum	0.0371		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 17:09	1
Selenium	0.0293		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 17:09	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 17:09	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	348		30.0	26.0	mg/L			05/14/20 14:36	1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-9

Date Collected: 05/06/20 13:15
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-9

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25.4**		5.00	2.00	mg/L			05/14/20 22:15	5
Nitrate as N	**9.87**	**H H3**	0.500	0.245	mg/L			05/14/20 22:15	5
Fluoride	**0.992**		0.500	0.230	mg/L			05/14/20 22:15	5
Sulfate	**126**		5.00	3.55	mg/L			05/14/20 22:15	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 17:12	1
Arsenic	**0.00209**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 17:12	1
Barium	**0.0473**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 17:12	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 17:12	1
Boron	**0.750**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 17:12	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 17:12	1
Calcium	**33.4**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 17:12	1
Chromium	**0.0298**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 17:12	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 17:12	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 17:12	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 17:12	1
Lithium	**0.00670**	**J**	0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 17:12	1
Molybdenum	**0.0182**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 17:12	1
Selenium	**0.0363**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 17:12	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 17:12	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**328**		30.0	26.0	mg/L			05/13/20 14:40	1

Client Sample ID: MW-107

Date Collected: 05/06/20 11:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-10

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**29.2**		5.00	2.00	mg/L			05/14/20 23:02	5
Nitrate as N	**8.67**	**H H3**	0.500	0.245	mg/L			05/14/20 23:02	5
Fluoride	**0.942**		0.500	0.230	mg/L			05/14/20 23:02	5
Sulfate	**187**		5.00	3.55	mg/L			05/14/20 23:02	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 17:14	1
Arsenic	**0.00441**		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 17:14	1
Barium	**0.0416**		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 17:14	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 17:14	1
Boron	**1.48**		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 17:14	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 17:14	1
Calcium	**41.0**		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 17:14	1
Chromium	**0.0271**		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 17:14	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 17:14	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 17:14	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 17:14	1
Lithium	**0.0105**		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 17:14	1
Molybdenum	**0.0261**		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 17:14	1
Selenium	**0.0434**		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 17:14	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 17:14	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	**448**		30.0	26.0	mg/L			05/13/20 14:40	1

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: FB-2B

Date Collected: 05/06/20 18:42
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-11

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.400	mg/L			05/14/20 23:17	1
Nitrate as N	<0.100	H H3	0.100	0.0490	mg/L			05/14/20 23:17	1
Fluoride	<0.100		0.100	0.0460	mg/L			05/14/20 23:17	1
Sulfate	<1.00		1.00	0.710	mg/L			05/14/20 23:17	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 17:17	1
Arsenic	<0.00200		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 17:17	1
Barium	<0.00200		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 17:17	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 17:17	1
Boron	<0.100		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 17:17	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 17:17	1
Calcium	<0.500		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 17:17	1
Chromium	<0.00500		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 17:17	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 17:17	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 17:17	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 17:17	1
Lithium	<0.0100		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 17:17	1
Molybdenum	<0.00200		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 17:17	1
Selenium	<0.00500		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 17:17	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 17:17	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 13:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids	<30.0		30.0	26.0	mg/L			05/13/20 14:40	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
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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-279261/3
Matrix: Water
Analysis Batch: 279261

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	0.400	mg/L			05/14/20 16:47	1
Nitrate as N	<0.100		0.100	0.0490	mg/L			05/14/20 16:47	1
Fluoride	<0.100		0.100	0.0460	mg/L			05/14/20 16:47	1
Sulfate	<1.00		1.00	0.710	mg/L			05/14/20 16:47	1

Lab Sample ID: LCS 310-279261/4
Matrix: Water
Analysis Batch: 279261

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	9.445		mg/L		94	90 - 110
Nitrate as N	2.00	2.013		mg/L		101	90 - 110
Fluoride	2.00	1.979		mg/L		99	90 - 110
Sulfate	10.0	10.25		mg/L		102	90 - 110

Lab Sample ID: 310-181620-1 MS
Matrix: Water
Analysis Batch: 279261

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	26.7		25.0	49.31		mg/L		90	80 - 120
Nitrate as N	9.47	H H3	5.00	14.52		mg/L		101	80 - 120
Fluoride	0.587		5.00	5.714		mg/L		103	80 - 120
Sulfate	158		25.0	183.5	4	mg/L		101	80 - 120

Lab Sample ID: 310-181620-1 MSD
Matrix: Water
Analysis Batch: 279261

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	26.7		25.0	48.14		mg/L		86	80 - 120	2	15
Nitrate as N	9.47	H H3	5.00	13.54		mg/L		81	80 - 120	7	15
Fluoride	0.587		5.00	5.632		mg/L		101	80 - 120	1	15
Sulfate	158		25.0	178.1	4	mg/L		80	80 - 120	3	15

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-278804/1-A
Matrix: Water
Analysis Batch: 279310

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278804

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000580	mg/L		05/14/20 08:13	05/18/20 15:57	1
Arsenic	<0.00200		0.00200	0.000880	mg/L		05/14/20 08:13	05/18/20 15:57	1
Barium	<0.00200		0.00200	0.000900	mg/L		05/14/20 08:13	05/18/20 15:57	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		05/14/20 08:13	05/18/20 15:57	1
Boron	<0.100		0.100	0.0730	mg/L		05/14/20 08:13	05/18/20 15:57	1
Cadmium	<0.000100		0.000100	0.0000390	mg/L		05/14/20 08:13	05/18/20 15:57	1
Calcium	<0.500		0.500	0.190	mg/L		05/14/20 08:13	05/18/20 15:57	1
Chromium	<0.00500		0.00500	0.00110	mg/L		05/14/20 08:13	05/18/20 15:57	1

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

Lab Sample ID: MB 310-278804/1-A
Matrix: Water
Analysis Batch: 279310

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 278804

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	<0.000500		0.000500	0.0000910	mg/L		05/14/20 08:13	05/18/20 15:57	1
Iron	<0.100		0.100	0.0500	mg/L		05/14/20 08:13	05/18/20 15:57	1
Lead	<0.000500		0.000500	0.000270	mg/L		05/14/20 08:13	05/18/20 15:57	1
Lithium	<0.0100		0.0100	0.00230	mg/L		05/14/20 08:13	05/18/20 15:57	1
Molybdenum	<0.00200		0.00200	0.00110	mg/L		05/14/20 08:13	05/18/20 15:57	1
Selenium	<0.00500		0.00500	0.00100	mg/L		05/14/20 08:13	05/18/20 15:57	1
Thallium	<0.00100		0.00100	0.000260	mg/L		05/14/20 08:13	05/18/20 15:57	1

Lab Sample ID: LCS 310-278804/2-A
Matrix: Water
Analysis Batch: 279310

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 278804

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0400	0.03463		mg/L		87	80 - 120
Arsenic	0.0800	0.07354		mg/L		92	80 - 120
Barium	0.0800	0.08486		mg/L		106	80 - 120
Beryllium	0.0400	0.04354		mg/L		109	80 - 120
Boron	1.76	1.936		mg/L		110	80 - 120
Cadmium	0.0400	0.04324		mg/L		108	80 - 120
Calcium	4.00	4.279		mg/L		107	80 - 120
Chromium	0.0800	0.08339		mg/L		104	80 - 120
Cobalt	0.0400	0.04281		mg/L		107	80 - 120
Iron	4.00	4.251		mg/L		106	80 - 120
Lead	0.0400	0.04381		mg/L		110	80 - 120
Lithium	0.200	0.2049		mg/L		102	80 - 120
Molybdenum	0.0800	0.07460		mg/L		93	80 - 120
Selenium	0.0800	0.07735		mg/L		97	80 - 120
Thallium	0.0320	0.03424		mg/L		107	80 - 120

Lab Sample ID: 310-181620-3 DU
Matrix: Water
Analysis Batch: 279310

Client Sample ID: MW-3R
Prep Type: Total/NA
Prep Batch: 278804

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	<0.00100		<0.00100		mg/L		NC	20
Arsenic	0.00239		0.002462		mg/L		3	20
Barium	0.0905		0.09207		mg/L		2	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Boron	0.971		1.032		mg/L		6	20
Cadmium	<0.000100		<0.000100		mg/L		NC	20
Calcium	90.8		91.56		mg/L		0.9	20
Chromium	0.0100		0.01007		mg/L		0.3	20
Cobalt	0.000188	J	0.0001960	J	mg/L		4	20
Iron	0.259		0.2621		mg/L		1	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	0.0306		0.03015		mg/L		1	20
Molybdenum	0.00593		0.006043		mg/L		2	20
Selenium	0.0606		0.06090		mg/L		0.4	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-279553/1-A
Matrix: Water
Analysis Batch: 279744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 279553

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		05/20/20 13:45	05/21/20 12:57	1

Lab Sample ID: LCS 310-279553/2-A
Matrix: Water
Analysis Batch: 279744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 279553

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001692		mg/L		102	80 - 120

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

Lab Sample ID: MB 310-278730/1
Matrix: Water
Analysis Batch: 278730

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	<30.0		30.0	26.0	mg/L			05/13/20 14:40	1

Lab Sample ID: LCS 310-278730/2
Matrix: Water
Analysis Batch: 278730

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	1000		mg/L		100	90 - 110

Lab Sample ID: 310-181620-1 DU
Matrix: Water
Analysis Batch: 278730

Client Sample ID: MW-1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids	390		410.0		mg/L		5	24

Lab Sample ID: MB 310-278876/1
Matrix: Water
Analysis Batch: 278876

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	<30.0		30.0	26.0	mg/L			05/14/20 14:36	1

Lab Sample ID: LCS 310-278876/2
Matrix: Water
Analysis Batch: 278876

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	986.0		mg/L		99	90 - 110

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

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

Lab Sample ID: 310-181620-8 DU
Matrix: Water
Analysis Batch: 278876

Client Sample ID: MW-8
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	348			346.0		mg/L				0.6	24

HPLC/IC

Analysis Batch: 279261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	9056A	
310-181620-2	MW-2B	Total/NA	Water	9056A	
310-181620-3	MW-3R	Total/NA	Water	9056A	
310-181620-4	MW-4B	Total/NA	Water	9056A	
310-181620-5	MW-5B	Total/NA	Water	9056A	
310-181620-6	MW-6	Total/NA	Water	9056A	
310-181620-7	MW-7	Total/NA	Water	9056A	
310-181620-8	MW-8	Total/NA	Water	9056A	
310-181620-9	MW-9	Total/NA	Water	9056A	
310-181620-10	MW-107	Total/NA	Water	9056A	
310-181620-11	FB-2B	Total/NA	Water	9056A	
MB 310-279261/3	Method Blank	Total/NA	Water	9056A	
LCS 310-279261/4	Lab Control Sample	Total/NA	Water	9056A	
310-181620-1 MS	MW-1	Total/NA	Water	9056A	
310-181620-1 MSD	MW-1	Total/NA	Water	9056A	

Metals

Prep Batch: 278804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	3010A	
310-181620-2	MW-2B	Total/NA	Water	3010A	
310-181620-3	MW-3R	Total/NA	Water	3010A	
310-181620-4	MW-4B	Total/NA	Water	3010A	
310-181620-5	MW-5B	Total/NA	Water	3010A	
310-181620-6	MW-6	Total/NA	Water	3010A	
310-181620-7	MW-7	Total/NA	Water	3010A	
310-181620-8	MW-8	Total/NA	Water	3010A	
310-181620-9	MW-9	Total/NA	Water	3010A	
310-181620-10	MW-107	Total/NA	Water	3010A	
310-181620-11	FB-2B	Total/NA	Water	3010A	
MB 310-278804/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-278804/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-181620-3 DU	MW-3R	Total/NA	Water	3010A	

Analysis Batch: 279310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	6020A	278804
310-181620-2	MW-2B	Total/NA	Water	6020A	278804
310-181620-3	MW-3R	Total/NA	Water	6020A	278804
310-181620-4	MW-4B	Total/NA	Water	6020A	278804
310-181620-5	MW-5B	Total/NA	Water	6020A	278804
310-181620-6	MW-6	Total/NA	Water	6020A	278804
310-181620-7	MW-7	Total/NA	Water	6020A	278804
310-181620-8	MW-8	Total/NA	Water	6020A	278804
310-181620-9	MW-9	Total/NA	Water	6020A	278804
310-181620-10	MW-107	Total/NA	Water	6020A	278804
310-181620-11	FB-2B	Total/NA	Water	6020A	278804
MB 310-278804/1-A	Method Blank	Total/NA	Water	6020A	278804
LCS 310-278804/2-A	Lab Control Sample	Total/NA	Water	6020A	278804
310-181620-3 DU	MW-3R	Total/NA	Water	6020A	278804

Metals

Analysis Batch: 279319

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	6020A	278804
310-181620-2	MW-2B	Total/NA	Water	6020A	278804
310-181620-3	MW-3R	Total/NA	Water	6020A	278804
310-181620-4	MW-4B	Total/NA	Water	6020A	278804
310-181620-5	MW-5B	Total/NA	Water	6020A	278804
310-181620-6	MW-6	Total/NA	Water	6020A	278804
310-181620-7	MW-7	Total/NA	Water	6020A	278804
310-181620-8	MW-8	Total/NA	Water	6020A	278804
310-181620-9	MW-9	Total/NA	Water	6020A	278804
310-181620-10	MW-107	Total/NA	Water	6020A	278804
310-181620-11	FB-2B	Total/NA	Water	6020A	278804
310-181620-3 DU	MW-3R	Total/NA	Water	6020A	278804

Prep Batch: 279553

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	7470A	
310-181620-2	MW-2B	Total/NA	Water	7470A	
310-181620-3	MW-3R	Total/NA	Water	7470A	
310-181620-4	MW-4B	Total/NA	Water	7470A	
310-181620-5	MW-5B	Total/NA	Water	7470A	
310-181620-6	MW-6	Total/NA	Water	7470A	
310-181620-7	MW-7	Total/NA	Water	7470A	
310-181620-8	MW-8	Total/NA	Water	7470A	
310-181620-9	MW-9	Total/NA	Water	7470A	
310-181620-10	MW-107	Total/NA	Water	7470A	
310-181620-11	FB-2B	Total/NA	Water	7470A	
MB 310-279553/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-279553/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 279744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	7470A	279553
310-181620-2	MW-2B	Total/NA	Water	7470A	279553
310-181620-3	MW-3R	Total/NA	Water	7470A	279553
310-181620-4	MW-4B	Total/NA	Water	7470A	279553
310-181620-5	MW-5B	Total/NA	Water	7470A	279553
310-181620-6	MW-6	Total/NA	Water	7470A	279553
310-181620-7	MW-7	Total/NA	Water	7470A	279553
310-181620-8	MW-8	Total/NA	Water	7470A	279553
310-181620-9	MW-9	Total/NA	Water	7470A	279553
310-181620-10	MW-107	Total/NA	Water	7470A	279553
310-181620-11	FB-2B	Total/NA	Water	7470A	279553
MB 310-279553/1-A	Method Blank	Total/NA	Water	7470A	279553
LCS 310-279553/2-A	Lab Control Sample	Total/NA	Water	7470A	279553

General Chemistry

Analysis Batch: 278730

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-1	MW-1	Total/NA	Water	SM 2540C	
310-181620-2	MW-2B	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 278730 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-3	MW-3R	Total/NA	Water	SM 2540C	
310-181620-4	MW-4B	Total/NA	Water	SM 2540C	
310-181620-5	MW-5B	Total/NA	Water	SM 2540C	
310-181620-6	MW-6	Total/NA	Water	SM 2540C	
310-181620-7	MW-7	Total/NA	Water	SM 2540C	
310-181620-9	MW-9	Total/NA	Water	SM 2540C	
310-181620-10	MW-107	Total/NA	Water	SM 2540C	
310-181620-11	FB-2B	Total/NA	Water	SM 2540C	
MB 310-278730/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-278730/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-181620-1 DU	MW-1	Total/NA	Water	SM 2540C	

Analysis Batch: 278876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-181620-8	MW-8	Total/NA	Water	SM 2540C	
MB 310-278876/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-278876/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-181620-8 DU	MW-8	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-1
Date Collected: 05/06/20 18:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 19:08	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:40	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:40	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:10	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-2B
Date Collected: 05/06/20 18:40
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 20:26	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:42	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:42	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:12	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-3R
Date Collected: 05/06/20 16:40
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 20:41	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:45	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:45	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:18	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-4B
Date Collected: 05/06/20 16:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 20:57	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:50	SAD	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: MW-4B
Date Collected: 05/06/20 16:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:50	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:20	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-5B
Date Collected: 05/06/20 12:30
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 21:13	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:53	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:53	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:23	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-6
Date Collected: 05/06/20 14:00
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 21:28	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 16:56	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 16:56	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:25	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-7
Date Collected: 05/06/20 17:20
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 21:44	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 17:06	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 17:06	SAD	TAL CF

Client Sample ID: MW-7
Lab Sample ID: 310-181620-7
Date Collected: 05/06/20 17:20
Matrix: Water
Date Received: 05/13/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:27	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-8
Lab Sample ID: 310-181620-8
Date Collected: 05/07/20 10:15
Matrix: Water
Date Received: 05/13/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 21:59	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 17:09	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 17:09	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:29	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278876	05/14/20 14:36	SAS	TAL CF

Client Sample ID: MW-9
Lab Sample ID: 310-181620-9
Date Collected: 05/06/20 13:15
Matrix: Water
Date Received: 05/13/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 22:15	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 17:12	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 17:12	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:31	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Client Sample ID: MW-107
Lab Sample ID: 310-181620-10
Date Collected: 05/06/20 11:00
Matrix: Water
Date Received: 05/13/20 09:10

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	279261	05/14/20 23:02	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 17:14	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 17:14	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:33	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Client Sample ID: FB-2B

Date Collected: 05/06/20 18:42
Date Received: 05/13/20 09:10

Lab Sample ID: 310-181620-11

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	279261	05/14/20 23:17	CJT	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279310	05/18/20 17:17	SAD	TAL CF
Total/NA	Prep	3010A			278804	05/14/20 08:13	HED	TAL CF
Total/NA	Analysis	6020A		1	279319	05/18/20 17:17	SAD	TAL CF
Total/NA	Prep	7470A			279553	05/20/20 13:45	HIS	TAL CF
Total/NA	Analysis	7470A		1	279744	05/21/20 13:35	HIS	TAL CF
Total/NA	Analysis	SM 2540C		1	278730	05/13/20 14:40	LBB	TAL CF

Laboratory References:

TAL CF = Eurofins TestAmerica, 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: 310-181620-1

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
AIHA-LAP, LLC	Industrial Hygiene Laboratory Accreditation Program (IHLAP)	101044	11-01-20
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-20
Georgia	State	IA100001 (OR)	09-29-20
Illinois	NELAP	200024	11-29-20
Iowa	State	007	12-01-21
Kansas	NELAP	E-10341	01-31-21
Minnesota	NELAP	019-999-319	12-31-20
Minnesota (Petrofund)	State	3349	08-22-21
North Dakota	State	R-186	09-30-20
Oregon	NELAP	IA100001	09-29-20
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

Client: Hastings Utilities
Project/Site: WEC MW Sampling

Job ID: 310-181620-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL 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:

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

eurofins | Environment Testing TestAmerica

310-181620 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: PPGA

City/State: CITY Hastings STATE NE Project: WBC MW Sampling

Receipt Information

Date/Time Received: DATE 5/13/20 TIME 0910 Received By:

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 # 1 of ~~2~~ 1 5/13/20
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: N Correction Factor (°C): 0

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

Uncorrected Temp (°C): 0.5 Corrected Temp (°C): 0.5

Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	_____ of _____ COCs
	Analysis Turnaround Time			Sampler:
Hastings, NE 68901	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
	☐ 2 days			Job / SDG No.:
P O #6041	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Metals	Iron	Sulfate	TDS	Molybdenum	Selenium	Lithium	Mercury	Chloride	Fluoride	Total Boron	Total Calcium	Nickel	Manganese	TOC	Nitrate	Sample Specific Notes:
MW-1	5/6/20	18:00			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-2B	5/6/20	18:40			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-3R	5/6/20	16:40			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-4B	5/6/20	16:00			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-5B	5/6/20	12:30			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-6	5/6/20	14:00			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-7	5/6/20	17:20			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-8	5/7/20	10:15			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-9	5/6/20	13:15			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
MW-107	5/6/20	11:00			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
FB-2B	5/6/20	18:42			2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 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

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

☐ Return to Client ☐ Disposal by Lab ☐ Archive for_____ Months

Special Instructions/QC Requirements & Comments: Please report MDL and RL on lab results report. Please report this COC as ~~one final~~ as a seperate report from 2nd cooler delivered.

Nitrate will be out of hold time, please still run & report.

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:_____ Corr'd:_____		Therm ID No.:_____
Relinquished by:	Company: Hastings Utilities	5-12-20 12:45	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time: 5/13/20 0910

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

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 310-181620-1

Login Number: 181620
List Number: 1
Creator: Johnson, Josie A

List Source: Eurofins TestAmerica, 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.	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)	False	Nitrates received past hold.
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	

eurofins | Environment Testing TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

Laboratory Job ID: 160-37326-1
Client Project/Site: Rad Samples - RAD ONLY

For:
Hastings Utilities
1228 N. Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Attn: Jenny Sidlo

Authorized for release by:
3/6/2020 2:45:36 PM

Shirley Thompson, Senior Project Manager
(319)277-2401
shirley.thompson@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Case Narrative 3
Chain of Custody 4
Receipt Checklists 8
Definitions/Glossary 9
Method Summary 10
Sample Summary 11
Client Sample Results 12
QC Sample Results 18
QC Association Summary 20
Tracer Carrier Summary 21

Case Narrative

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Job ID: 160-37326-1

Laboratory: Eurofins TestAmerica, St. Louis

Narrative

Job Narrative
160-37326-1

Comments
No additional comments.

Receipt
The samples were received on 2/21/2020 9:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 14.0º C, 14.0º C, 14.0º C and 14.0º C.

RAD
Method PrecSep_0: Radium 228 Prep Batch 160-461565: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (160-37326-1), MW-2B (160-37326-2), MW-3B (160-37326-3), MW-4B (160-37326-4), MW-5B (160-37326-5), MW-6 (160-37326-6), MW-7 (160-37326-7), MW-8 (160-37326-8) and MW-9 (160-37326-9). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method PrecSep_0: Total Alpha Radium Prep Batch 160-461599: Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-1 (160-37326-1), MW-2B (160-37326-2), MW-3B (160-37326-3), MW-4B (160-37326-4), MW-5B (160-37326-5), MW-6 (160-37326-6), MW-7 (160-37326-7), MW-8 (160-37326-8) and MW-9 (160-37326-9). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Method 904.0: Radium-228 Prep Batch 160-461565 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. MW-1 (160-37326-1), MW-2B (160-37326-2), MW-3B (160-37326-3), MW-4B (160-37326-4), MW-5B (160-37326-5), MW-6 (160-37326-6), MW-7 (160-37326-7), MW-8 (160-37326-8), MW-9 (160-37326-9), (LCS 160-461565/1-A), (LCSD 160-461565/2-A) and (MB 160-461565/23-A)

Method 903.0: Radium, Total Alpha-Emitting Prep Batch 160-461599 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.
MW-1 (160-37326-1), MW-2B (160-37326-2), MW-3B (160-37326-3), MW-4B (160-37326-4), MW-5B (160-37326-5), MW-6 (160-37326-6), MW-7 (160-37326-7), MW-8 (160-37326-8), MW-9 (160-37326-9), (LCS 160-461599/1-A), (LCSD 160-461599/2-A) and (MB 160-461599/23-A)

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

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☐Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	____ of ____ COCs
1228 N Dnever Ave	**Analysis Turnaround Time**			Sampler:
Hastings, NE 68901	☐CALENDAR DAYS ☐WORKING DAYS			**For Lab Use Only:**
402-462-3664	TAT if different from Below ____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
Ash Pond	☐ 2 days			Job / SDG No.:
P O #6675	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Radium 226 EPA 903.0 & 228 EPA 904	Combined Radium	Sample Specific Notes:
MW-1	2-17-20	16:00	G		2	N		X	X	
MW-2B	2-17-20	16:40	G		2	N		X	X	
MW-3B	2-17-20	14:25	G		2	N		X	X	
MW-4B	2-17-20	13:40	G		2	N		X	X	
MW-5B	2-17-20	9:35	G		2	N		X	X	
MW-6	2-17-20	10:55	G		2	N		X	X	
MW-7	2-17-20	15:20	G		2	N		X	X	
MW-8	2-17-20	17:20	G		2	N		X	X	
MW-9	2-17-20	10:15	G		2	N		X	X	
			~~G~~		~~2~~	~~N~~		~~X~~	~~X~~	

160-37326 Chain of Custody

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

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

☐Return to Client ☐Disposal by Lab ☐Archive for____ Months

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

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:____ Corr'd:____ Therm ID No.:____

Relinquished by:	Company: Hastings Utilities	Date/Time: 2-17-20 12:45	Received by:	Company: EMSTL	Date/Time: 2-21-20 09:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☐Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	_____ of _____ COCs
1228 N Dnever Ave	**Analysis Turnaround Time**			Sampler:
Hastings, NE 68901	☐ CALENDAR DAYS ☐ WORKING DAYS			**For Lab Use Only:**
402-462-3664	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
WEC New wells JO-475	☐ 2 days			Job / SDG No.:
P O #6675	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Radium 226 EPA 903.0 & 228 EPA 904	Combined Radium	Sample Specific Notes:
MW-10S	2-18-20	13:10			2	N		X	X	
MW-10M	2-18-20	12:45			2	N		X	X	
MW-11S	2-18-20	9:15			2	N		X	X	
~~MW-10M~~	~~2-18-20~~	~~13:45~~			2	N		X	X	
MW-11M	2-18-20	9:55			2	N		X	X	
					2	N		X	X	
					2	N		X	X	
					2	N		X	X	
					2	N		X	X	
					2	N		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

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

☐Return to Client ☐Disposal by Lab ☐Archive for_____ Months

Special Instructions/QC Requirements & Comments: Please provide MDL's and RL's on lab report. Please report as a separate project from other coolers/COC's

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:_____ Corr'd:_____		Therm ID No.:_____
Relinquished by:	Company: Hastings Utilities	2-19-20 12:45	Received by: Michael Heim	Company: ETA SL2	Date/Time: 02/21/20 09:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☐Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	_____ of _____ COCs
1228 N Dnever Ave	**Analysis Turnaround Time**			Sampler:
Hastings, NE 68901	☐CALENDAR DAYS ☐WORKING DAYS			**For Lab Use Only:**
402-462-3664	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
WEC New wells JO-475	☐ 2 days			Job / SDG No.:
P O #6675	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Radium 226 EPA 903.0 & 228 EPA 904	Combined Radium	Sample Specific Notes:
MW-12S	2-18-20	14:05			2	N		X	X	
MW-12M	2-18-20	14:55			2	N		X	X	
MW-13S	2-18-20	16:05			2	N		X	X	
MW-13M	2-18-20	16:45			2	N		X	X	
MW-14S	2-18-20	12:40			2	N		X	X	
MW-15S	2-18-20	12:00			2	N		X	X	
					2	N		X	X	
					2	N		X	X	
					2	N		X	X	
					2	N		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

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

☐Return to Client ☐Disposal by Lab ☐Archive for_____ Months

Special Instructions/QC Requirements & Comments: Please provide MDL's and RL's on lab report. Please report as a separate project from other coolers/COC's

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:_____ Corr'd:_____ Therm ID No.:_____		
Relinquished by:	Company: Hastings Utilities	2-19-20 13:00	Received by:	Company: EPA SRT	Date/Time: 02/21/20 09:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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

3/6/2020

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

Regulatory Program: ☐DW ☐NPDES ☐RCRA ☐Other:

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	____ of ____ COCs
1228 N Dnever Ave	**Analysis Turnaround Time**			Sampler:
Hastings, NE 68901	☐CALENDAR DAYS ☐WORKING DAYS			**For Lab Use Only:**
402-462-3664	TAT if different from Below ____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
Ash Pond	☐ 2 days			Job / SDG No.:
P O #6675	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Radium 226 EPA 903.0 & 228 EPA 904	Combined Radium	Sample Specific Notes:
Ash Pond	2-19-20	10:45	G		2	N		X	X	
Neutralization Pond	2-19-20	10:00	G		2	N		X	X	
Coal Pile Lagoon	2-19-20	9:25	G		2	N		X	X	
Leachate Pond	2-19-20	9:00	G		2	N		X	X	
			G		2	N		X	X	
			G		2	N		X	X	
			G		2	N		X	X	
			G		2	N		X	X	
			G		2	N		X	X	
			G		2	N		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

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

☐Return to Client ☐Disposal by Lab ☐Archive for____ Months

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

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temp. (°C): Obs'd:____ Corr'd:____ Therm ID No.:____

Relinquished by:	Company: Hastings Utilities	2-19-20 13:10	Received by: Michael Flum	Company: EPA SR	Date/Time: 02/21/20 09:15
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

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

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 160-37326-1

Login Number: 37326
List Number: 1
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis

Question	Answer	Comment
Radioactivity wasn't checked or is </= 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.	N/A	
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	14.0
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?	N/A	
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").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Hastings Utilities
Job ID: 160-37326-1
Project/Site: Rad Samples - RAD ONLY

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
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)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
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)

Method Summary

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Method	Method Description	Protocol	Laboratory
903.0	Total Alpha Radium (GFPC)	EPA	TAL SL
904.0	Radium-228 (GFPC)	EPA	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

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

Laboratory References:

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

Sample Summary

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
160-37326-1	MW-1	Water	02/17/20 16:00	02/21/20 09:15	
160-37326-2	MW-2B	Water	02/17/20 16:40	02/21/20 09:15	
160-37326-3	MW-3B	Water	02/17/20 14:25	02/21/20 09:15	
160-37326-4	MW-4B	Water	02/17/20 13:40	02/21/20 09:15	
160-37326-5	MW-5B	Water	02/17/20 09:35	02/21/20 09:15	
160-37326-6	MW-6	Water	02/17/20 10:55	02/21/20 09:15	
160-37326-7	MW-7	Water	02/17/20 15:20	02/21/20 09:15	
160-37326-8	MW-8	Water	02/17/20 17:20	02/21/20 09:15	
160-37326-9	MW-9	Water	02/17/20 10:15	02/21/20 09:15	

Client Sample Results

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Client Sample ID: MW-1

Date Collected: 02/17/20 16:00
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-1

Matrix: Water

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	**1.11**		0.383	0.396	1.00	0.386	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*80.0*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.216	U	0.252	0.252	1.00	0.415	pCi/L	02/24/20 07:42	02/27/20 18:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.2*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*
Y Carrier	*87.9*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*

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

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.32**		0.458	0.469	5.00	0.415	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-2B

Date Collected: 02/17/20 16:40
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-2

Matrix: Water

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	**1.32**		0.389	0.407	1.00	0.325	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.4*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.800**		0.299	0.308	1.00	0.411	pCi/L	02/24/20 07:42	02/27/20 18:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.3*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*
Y Carrier	*84.9*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*

Client Sample ID: MW-2B

Lab Sample ID: 160-37326-2

Date Collected: 02/17/20 16:40

Matrix: Water

Date Received: 02/21/20 09:15

Method: 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	2.12		0.491	0.510	5.00	0.411	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-3B

Lab Sample ID: 160-37326-3

Date Collected: 02/17/20 14:25

Matrix: Water

Date Received: 02/21/20 09:15

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	0.891		0.320	0.330	1.00	0.322	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.594		0.272	0.277	1.00	0.394	pCi/L	02/24/20 07:42	02/27/20 18:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.1*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*
Y Carrier	*86.0*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*

Method: 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	1.49		0.420	0.431	5.00	0.394	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-4B

Lab Sample ID: 160-37326-4

Date Collected: 02/17/20 13:40

Matrix: Water

Date Received: 02/21/20 09:15

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	1.44		0.407	0.427	1.00	0.344	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.5*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:00*	*1*

Client Sample ID: MW-4B

Date Collected: 02/17/20 13:40
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-4
Matrix: Water

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.415		0.247	0.250	1.00	0.376	pCi/L	02/24/20 07:42	02/27/20 18:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.1*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*
Y Carrier	*86.4*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:24*	*1*

Method: 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	1.85		0.476	0.495	5.00	0.376	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-5B

Date Collected: 02/17/20 09:35
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-5
Matrix: Water

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	0.904		0.394	0.402	1.00	0.491	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.6*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:00*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.394		0.239	0.241	1.00	0.364	pCi/L	02/24/20 07:42	02/27/20 18:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*
Y Carrier	*88.6*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*

Method: 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	1.30		0.461	0.469	5.00	0.491	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-6

Date Collected: 02/17/20 10:55
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-6

Matrix: Water

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	1.35		0.399	0.417	1.00	0.371	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	82.5		40 - 110	02/24/20 11:15	02/28/20 14:00	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.355		0.226	0.228	1.00	0.344	pCi/L	02/24/20 07:42	02/27/20 18:25	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.1		40 - 110	02/24/20 07:42	02/27/20 18:25	1
Y Carrier	87.1		40 - 110	02/24/20 07:42	02/27/20 18:25	1

Method: 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	1.70		0.459	0.475	5.00	0.371	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-7

Date Collected: 02/17/20 15:20
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-7

Matrix: Water

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	1.26		0.411	0.427	1.00	0.408	pCi/L	02/24/20 11:15	02/28/20 14:00	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110	02/24/20 11:15	02/28/20 14:00	1

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.298	U	0.275	0.276	1.00	0.443	pCi/L	02/24/20 07:42	02/27/20 18:25	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	89.5		40 - 110	02/24/20 07:42	02/27/20 18:25	1
Y Carrier	87.1		40 - 110	02/24/20 07:42	02/27/20 18:25	1

Client Sample ID: MW-7
Lab Sample ID: 160-37326-7
Date Collected: 02/17/20 15:20
Matrix: Water
Date Received: 02/21/20 09:15

Method: 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	1.56		0.495	0.508	5.00	0.443	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-8
Lab Sample ID: 160-37326-8
Date Collected: 02/17/20 17:20
Matrix: Water
Date Received: 02/21/20 09:15

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	0.349	U	0.306	0.308	1.00	0.473	pCi/L	02/24/20 11:15	02/28/20 14:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.4*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:01*	*1*

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.359	U	0.248	0.250	1.00	0.387	pCi/L	02/24/20 07:42	02/27/20 18:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.0*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*
Y Carrier	*88.2*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*

Method: 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	0.708		0.394	0.397	5.00	0.473	pCi/L		03/02/20 08:01	1

Client Sample ID: MW-9
Lab Sample ID: 160-37326-9
Date Collected: 02/17/20 10:15
Matrix: Water
Date Received: 02/21/20 09:15

Method: 903.0 - Total Alpha Radium (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	0.713		0.305	0.312	1.00	0.349	pCi/L	02/24/20 11:15	02/28/20 14:01	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.9*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:01*	*1*

Client Sample Results

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Client Sample ID: MW-9

Date Collected: 02/17/20 10:15
Date Received: 02/21/20 09:15

Lab Sample ID: 160-37326-9

Matrix: Water

Method: 904.0 - Radium-228 (GFPC)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.269	U	0.216	0.217	1.00	0.339	pCi/L	02/24/20 07:42	02/27/20 18:25	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.8*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*
Y Carrier	*84.9*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:25*	*1*

Method: 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	**0.982**		0.374	0.380	5.00	0.349	pCi/L		03/02/20 08:01	1

Method: 903.0 - Total Alpha Radium (GFPC)

Lab Sample ID: MB 160-461599/23-A
Matrix: Water
Analysis Batch: 462306

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 461599

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Total Alpha Radium	0.03594	U	0.231	0.231	1.00	0.449	pCi/L	02/24/20 11:15	02/28/20 14:19	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*70.2*		*40 - 110*	*02/24/20 11:15*	*02/28/20 14:19*	*1*

Lab Sample ID: LCS 160-461599/1-A
Matrix: Water
Analysis Batch: 462343

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 461599

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Total Alpha Radium			11.3	10.41		1.39	1.00	0.346	pCi/L	92	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*78.5*		*40 - 110*

Lab Sample ID: LCSD 160-461599/2-A
Matrix: Water
Analysis Batch: 462343

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 461599

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Total Alpha Radium			11.3	10.07		1.37	1.00	0.405	pCi/L	89	75 - 125	0.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*79.1*		*40 - 110*

Method: 904.0 - Radium-228 (GFPC)

Lab Sample ID: MB 160-461565/23-A
Matrix: Water
Analysis Batch: 462064

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 461565

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.04045	U	0.243	0.243	1.00	0.425	pCi/L	02/24/20 07:42	02/27/20 18:28	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*103*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:28*	*1*
Y Carrier	*88.6*		*40 - 110*	*02/24/20 07:42*	*02/27/20 18:28*	*1*

Method: 904.0 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-461565/1-A
Matrix: Water
Analysis Batch: 462222

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 461565

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			9.07	7.163		0.861	1.00	0.363	pCi/L	79	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*106*		*40 - 110*
Y Carrier	*87.9*		*40 - 110*

Lab Sample ID: LCSD 160-461565/2-A
Matrix: Water
Analysis Batch: 462222

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 461565

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.07	7.352		0.895	1.00	0.378	pCi/L	81	75 - 125	0.11	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*99.7*		*40 - 110*
Y Carrier	*86.4*		*40 - 110*

QC Association Summary

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Rad

Prep Batch: 461565

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-37326-1	MW-1	Total/NA	Water	PrecSep_0	
160-37326-2	MW-2B	Total/NA	Water	PrecSep_0	
160-37326-3	MW-3B	Total/NA	Water	PrecSep_0	
160-37326-4	MW-4B	Total/NA	Water	PrecSep_0	
160-37326-5	MW-5B	Total/NA	Water	PrecSep_0	
160-37326-6	MW-6	Total/NA	Water	PrecSep_0	
160-37326-7	MW-7	Total/NA	Water	PrecSep_0	
160-37326-8	MW-8	Total/NA	Water	PrecSep_0	
160-37326-9	MW-9	Total/NA	Water	PrecSep_0	
MB 160-461565/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-461565/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-461565/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Prep Batch: 461599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-37326-1	MW-1	Total/NA	Water	PrecSep_0	
160-37326-2	MW-2B	Total/NA	Water	PrecSep_0	
160-37326-3	MW-3B	Total/NA	Water	PrecSep_0	
160-37326-4	MW-4B	Total/NA	Water	PrecSep_0	
160-37326-5	MW-5B	Total/NA	Water	PrecSep_0	
160-37326-6	MW-6	Total/NA	Water	PrecSep_0	
160-37326-7	MW-7	Total/NA	Water	PrecSep_0	
160-37326-8	MW-8	Total/NA	Water	PrecSep_0	
160-37326-9	MW-9	Total/NA	Water	PrecSep_0	
MB 160-461599/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-461599/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-461599/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Tracer/Carrier Summary

Client: Hastings Utilities
Project/Site: Rad Samples - RAD ONLY

Job ID: 160-37326-1

Method: 903.0 - Total Alpha Radium (GFPC)

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

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)
160-37326-1	MW-1	80.0
160-37326-2	MW-2B	83.4
160-37326-3	MW-3B	91.1
160-37326-4	MW-4B	82.5
160-37326-5	MW-5B	84.6
160-37326-6	MW-6	82.5
160-37326-7	MW-7	84.0
160-37326-8	MW-8	83.4
160-37326-9	MW-9	88.9
LCS 160-461599/1-A	Lab Control Sample	78.5
LCSD 160-461599/2-A	Lab Control Sample Dup	79.1
MB 160-461599/23-A	Method Blank	70.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 904.0 - Radium-228 (GFPC)

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

Lab Sample ID	Client Sample ID	Percent Yield (Acceptance Limits) Ba Carrier (40-110)	Y Carrier (40-110)
160-37326-1	MW-1	90.2	87.9
160-37326-2	MW-2B	88.3	84.9
160-37326-3	MW-3B	95.1	86.0
160-37326-4	MW-4B	99.1	86.4
160-37326-5	MW-5B	98.2	88.6
160-37326-6	MW-6	95.1	87.1
160-37326-7	MW-7	89.5	87.1
160-37326-8	MW-8	96.0	88.2
160-37326-9	MW-9	98.8	84.9
LCS 160-461565/1-A	Lab Control Sample	106	87.9
LCSD 160-461565/2-A	Lab Control Sample Dup	99.7	86.4
MB 160-461565/23-A	Method Blank	103	88.6

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-195772-1
Client Project/Site: MEC MW Sampling

For:
Hastings Utilities
1228 N. Denver Ave
PO BOX 289
Hastings, Nebraska 68901

Attn: Jenny Sidlo

Authorized for release by:
12/8/2020 12:27:43 PM

Shirley Thompson, Senior Project Manager
(319)277-2401
Shirley.Thompson@Eurofinset.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at:
www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

Table of Contents

Cover Page 1
Table of Contents 2
Case Narrative 3
Sample Summary 4
Detection Summary 5
Client Sample Results 9
Definitions 21
QC Sample Results 22
QC Association 26
Chronicle 29
Certification Summary 33
Method Summary 34
Chain of Custody 35
Receipt Checklists 37

Case Narrative

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Job ID: 310-195772-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-195772-1

Comments
No additional comments.

Receipt
The samples were received on 11/20/2020 9:05 AM; the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.2º C.

Receipt Exceptions
The following samples were received outside of holding time for Nitrate: MW-01 (310-195772-1), MW-102B (310-195772-3), MW-3R (310-195772-4), MW-103 (310-195772-5), MW-4B (310-195772-6), MW-5B (310-195772-7), MW-6 (310-195772-8), MW-7 (310-195772-9), MW-8 (310-195772-10), MW-9 (310-195772-11) and MW-01FB (310-195772-12).

HPLC/IC
Method 9056A: The laboratory control sample (LCS) for analytical batch 310-300460 recovered outside control limits for the following analytes: Fluoride. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Methods 9056A: The following sample was diluted due to the nature of the sample matrix: MW-2B (310-195772-2). Elevated reporting limits (RLs) are provided.

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

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

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

Sample Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
310-195772-1	MW-01	Water	11/16/20 16:40	11/20/20 09:05	
310-195772-2	MW-2B	Water	11/18/20 13:45	11/20/20 09:05	
310-195772-3	MW-102B	Water	11/18/20 08:30	11/20/20 09:05	
310-195772-4	MW-3R	Water	11/16/20 15:15	11/20/20 09:05	
310-195772-5	MW-103	Water	11/16/20 10:50	11/20/20 09:05	
310-195772-6	MW-4B	Water	11/16/20 14:20	11/20/20 09:05	
310-195772-7	MW-5B	Water	11/16/20 12:10	11/20/20 09:05	
310-195772-8	MW-6	Water	11/16/20 13:30	11/20/20 09:05	
310-195772-9	MW-7	Water	11/16/20 16:00	11/20/20 09:05	
310-195772-10	MW-8	Water	11/16/20 17:20	11/20/20 09:05	
310-195772-11	MW-9	Water	11/16/20 12:50	11/20/20 09:05	
310-195772-12	MW-01FB	Water	11/16/20 16:42	11/20/20 09:05	

Detection Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-01 — Lab Sample ID: 310-195772-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	24.8		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	9.64	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.374	J	0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	139		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00409		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0627		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.969		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	28.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0329		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0101		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0395		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0297		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	294		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-2B — Lab Sample ID: 310-195772-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.1		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.57		0.500	0.245	mg/L	5		9056A	Total/NA
Sulfate	153		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00203		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.178		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.562		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	79.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0172		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0144		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.00267		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0372		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	474		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-102B — Lab Sample ID: 310-195772-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.5		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.72	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Sulfate	158		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00202		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.175		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.562		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	76.8		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0166		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0151		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.00246		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0358		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	484		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-3R — Lab Sample ID: 310-195772-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	33.1		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.14	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Sulfate	237		5.00	3.55	mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-3R (Continued) — Lab Sample ID: 310-195772-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00198	J	0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0611		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.925		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	64.4		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0237		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000668		0.000500	0.0000910	mg/L	1		6020A	Total/NA
Copper	0.00990		0.00500	0.00150	mg/L	1		6020A	Total/NA
Iron	0.591		0.100	0.0500	mg/L	1		6020A	Total/NA
Lithium	0.0314		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0107		0.00200	0.00110	mg/L	1		6020A	Total/NA
Nickel	0.0143		0.00500	0.00190	mg/L	1		6020A	Total/NA
Selenium	0.0351		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Suspended Solids	2.00	J	5.00	1.70	mg/L	1		I-3765-85	Total/NA
Total Dissolved Solids	522		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-103 — Lab Sample ID: 310-195772-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	32.8		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.12	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Sulfate	237		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00203		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0619		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.937		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	64.8		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0228		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000595		0.000500	0.0000910	mg/L	1		6020A	Total/NA
Copper	0.0104		0.00500	0.00150	mg/L	1		6020A	Total/NA
Iron	0.537		0.100	0.0500	mg/L	1		6020A	Total/NA
Lithium	0.0317		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0106		0.00200	0.00110	mg/L	1		6020A	Total/NA
Nickel	0.0132		0.00500	0.00190	mg/L	1		6020A	Total/NA
Selenium	0.0354		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	528		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-4B — Lab Sample ID: 310-195772-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	24.7		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.88	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.609		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	155		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00238		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0310		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	1.05		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	37.6		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0246		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0174		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0185		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0372		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	368		30.0	26.0	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-5B — Lab Sample ID: 310-195772-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	23.4		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	10.1	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	1.10		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	135		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00498		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0349		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	1.33		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	34.6		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0383		0.00500	0.00110	mg/L	1		6020A	Total/NA
Cobalt	0.000166	J	0.000500	0.0000910	mg/L	1		6020A	Total/NA
Lithium	0.0105		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0396		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0938		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	372		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-6 — Lab Sample ID: 310-195772-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.5		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	8.77	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.416	J	0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	148		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00203		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0433		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.761		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	51.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0244		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0134		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.00793		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0601		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	416		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-7 — Lab Sample ID: 310-195772-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	26.4		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	9.47	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.658		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	149		5.00	3.55	mg/L	5		9056A	Total/NA
Antimony	0.00103		0.00100	0.000510	mg/L	1		6020A	Total/NA
Arsenic	0.00417		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0388		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.825		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	31.0		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0267		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0117		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0245		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0381		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	362		30.0	26.0	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-8 — Lab Sample ID: 310-195772-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	25.1		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	10.0	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	0.886		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	154		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00329		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0383		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	0.879		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	32.1		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0445		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.0103		0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0318		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0408		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	380		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-9 — Lab Sample ID: 310-195772-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	23.5		5.00	2.00	mg/L	5		9056A	Total/NA
Nitrate as N	9.81	H H3	0.500	0.245	mg/L	5		9056A	Total/NA
Fluoride	1.14		0.500	0.230	mg/L	5		9056A	Total/NA
Sulfate	121		5.00	3.55	mg/L	5		9056A	Total/NA
Arsenic	0.00280		0.00200	0.000880	mg/L	1		6020A	Total/NA
Barium	0.0431		0.00200	0.000280	mg/L	1		6020A	Total/NA
Boron	1.37		0.100	0.0800	mg/L	1		6020A	Total/NA
Calcium	27.2		0.500	0.190	mg/L	1		6020A	Total/NA
Chromium	0.0469		0.00500	0.00110	mg/L	1		6020A	Total/NA
Lithium	0.00990	J	0.0100	0.00250	mg/L	1		6020A	Total/NA
Molybdenum	0.0241		0.00200	0.00110	mg/L	1		6020A	Total/NA
Selenium	0.0751		0.00500	0.00100	mg/L	1		6020A	Total/NA
Total Dissolved Solids	332		30.0	26.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-01FB — Lab Sample ID: 310-195772-12

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-01

Date Collected: 11/16/20 16:40
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-1

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**24.8**		5.00	2.00	mg/L			11/20/20 12:32	5
Nitrate as N	**9.64**	**H H3**	0.500	0.245	mg/L			11/20/20 12:32	5
Fluoride	**0.374**	**J**	0.500	0.230	mg/L			11/27/20 11:29	5
Sulfate	**139**		5.00	3.55	mg/L			11/20/20 12:32	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:11	1
Arsenic	**0.00409**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:11	1
Barium	**0.0627**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:11	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:11	1
Boron	**0.969**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:11	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:11	1
Calcium	**28.2**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:11	1
Chromium	**0.0329**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:11	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:11	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:11	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:11	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:11	1
Lithium	**0.0101**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:11	1
Molybdenum	**0.0395**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:11	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:11	1
Selenium	**0.0297**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:11	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:11	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:22	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**294**		30.0	26.0	mg/L			11/20/20 16:08	1

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-2B

Date Collected: 11/18/20 13:45
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-2

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.1**		5.00	2.00	mg/L			11/20/20 12:47	5
Nitrate as N	**8.57**		0.500	0.245	mg/L			11/20/20 12:47	5
Fluoride	<0.500		0.500	0.230	mg/L			11/27/20 11:45	5
Sulfate	**153**		5.00	3.55	mg/L			11/20/20 12:47	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:14	1
Arsenic	**0.00203**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:14	1
Barium	**0.178**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:14	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:14	1
Boron	**0.562**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:14	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:14	1
Calcium	**79.2**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:14	1
Chromium	**0.0172**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:14	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:14	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:14	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:14	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:14	1
Lithium	**0.0144**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:14	1
Molybdenum	**0.00267**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:14	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:14	1
Selenium	**0.0372**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:14	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:14	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:24	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**474**		30.0	26.0	mg/L			11/23/20 16:30	1

Client Sample ID: MW-102B

Date Collected: 11/18/20 08:30
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-3

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.5**		5.00	2.00	mg/L			11/20/20 13:03	5
Nitrate as N	**8.72**	**H H3**	0.500	0.245	mg/L			11/20/20 13:03	5
Fluoride	<0.500	*	0.500	0.230	mg/L			11/20/20 13:03	5
Sulfate	**158**		5.00	3.55	mg/L			11/20/20 13:03	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:17	1
Arsenic	**0.00202**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:17	1
Barium	**0.175**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:17	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:17	1
Boron	**0.562**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:17	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:17	1
Calcium	**76.8**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:17	1
Chromium	**0.0166**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:17	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:17	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:17	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:17	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:17	1
Lithium	**0.0151**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:17	1
Molybdenum	**0.00246**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:17	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:17	1
Selenium	**0.0358**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:17	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:17	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:27	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**484**		30.0	26.0	mg/L			11/23/20 16:30	1

Client Sample Results

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-3R

Date Collected: 11/16/20 15:15
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-4

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**33.1**		5.00	2.00	mg/L			11/20/20 13:19	5
Nitrate as N	**8.14**	**H H3**	0.500	0.245	mg/L			11/20/20 13:19	5
Fluoride	<0.500	*	0.500	0.230	mg/L			11/20/20 13:19	5
Sulfate	**237**		5.00	3.55	mg/L			11/20/20 13:19	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:19	1
Arsenic	**0.00198**	**J**	0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:19	1
Barium	**0.0611**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:19	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:19	1
Boron	**0.925**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:19	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:19	1
Calcium	**64.4**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:19	1
Chromium	**0.0237**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:19	1
Cobalt	**0.000668**		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:19	1
Copper	**0.00990**		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:19	1
Iron	**0.591**		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:19	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:19	1
Lithium	**0.0314**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:19	1
Molybdenum	**0.0107**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:19	1
Nickel	**0.0143**		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:19	1
Selenium	**0.0351**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:19	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:19	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:29	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	**2.00**	**J**	5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**522**		30.0	26.0	mg/L			11/20/20 16:08	1

Client Sample Results

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-103

Date Collected: 11/16/20 10:50
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-5

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**32.8**		5.00	2.00	mg/L			11/20/20 13:34	5
Nitrate as N	**8.12**	**H H3**	0.500	0.245	mg/L			11/20/20 13:34	5
Fluoride	<0.500	*	0.500	0.230	mg/L			11/20/20 13:34	5
Sulfate	**237**		5.00	3.55	mg/L			11/20/20 13:34	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:22	1
Arsenic	**0.00203**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:22	1
Barium	**0.0619**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:22	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:22	1
Boron	**0.937**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:22	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:22	1
Calcium	**64.8**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:22	1
Chromium	**0.0228**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:22	1
Cobalt	**0.000595**		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:22	1
Copper	**0.0104**		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:22	1
Iron	**0.537**		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:22	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:22	1
Lithium	**0.0317**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:22	1
Molybdenum	**0.0106**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:22	1
Nickel	**0.0132**		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:22	1
Selenium	**0.0354**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:22	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:22	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**528**		30.0	26.0	mg/L			11/20/20 16:08	1

Client Sample Results

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-4B

Date Collected: 11/16/20 14:20
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-6

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**24.7**		5.00	2.00	mg/L			11/20/20 13:50	5
Nitrate as N	**8.88**	**H H3**	0.500	0.245	mg/L			11/20/20 13:50	5
Fluoride	**0.609**		0.500	0.230	mg/L			11/27/20 12:00	5
Sulfate	**155**		5.00	3.55	mg/L			11/20/20 13:50	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:25	1
Arsenic	**0.00238**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:25	1
Barium	**0.0310**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:25	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:25	1
Boron	**1.05**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:25	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:25	1
Calcium	**37.6**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:25	1
Chromium	**0.0246**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:25	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:25	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:25	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:25	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:25	1
Lithium	**0.0174**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:25	1
Molybdenum	**0.0185**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:25	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:25	1
Selenium	**0.0372**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:25	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:25	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**368**		30.0	26.0	mg/L			11/20/20 16:08	1

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-5B

Date Collected: 11/16/20 12:10
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-7

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**23.4**		5.00	2.00	mg/L			11/20/20 14:05	5
Nitrate as N	**10.1**	**H H3**	0.500	0.245	mg/L			11/20/20 14:05	5
Fluoride	**1.10**		0.500	0.230	mg/L			11/27/20 12:16	5
Sulfate	**135**		5.00	3.55	mg/L			11/20/20 14:05	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:27	1
Arsenic	**0.00498**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:27	1
Barium	**0.0349**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:27	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:27	1
Boron	**1.33**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:27	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:27	1
Calcium	**34.6**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:27	1
Chromium	**0.0383**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:27	1
Cobalt	**0.000166**	**J**	0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:27	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:27	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:27	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:27	1
Lithium	**0.0105**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:27	1
Molybdenum	**0.0396**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:27	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:27	1
Selenium	**0.0938**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:27	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:27	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:35	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**372**		30.0	26.0	mg/L			11/20/20 16:08	1

Client Sample ID: MW-6

Date Collected: 11/16/20 13:30
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-8

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.5**		5.00	2.00	mg/L			11/20/20 14:51	5
Nitrate as N	**8.77**	**H H3**	0.500	0.245	mg/L			11/20/20 14:51	5
Fluoride	**0.416**	**J**	0.500	0.230	mg/L			11/27/20 12:31	5
Sulfate	**148**		5.00	3.55	mg/L			11/20/20 14:51	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:30	1
Arsenic	**0.00203**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:30	1
Barium	**0.0433**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:30	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:30	1
Boron	**0.761**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:30	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:30	1
Calcium	**51.2**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:30	1
Chromium	**0.0244**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:30	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:30	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:30	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:30	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:30	1
Lithium	**0.0134**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:30	1
Molybdenum	**0.00793**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:30	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:30	1
Selenium	**0.0601**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:30	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:30	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:37	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**416**		30.0	26.0	mg/L			11/20/20 16:08	1

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-7

Date Collected: 11/16/20 16:00
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-9

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**26.4**		5.00	2.00	mg/L			11/20/20 14:36	5
Nitrate as N	**9.47**	**H H3**	0.500	0.245	mg/L			11/20/20 14:36	5
Fluoride	**0.658**		0.500	0.230	mg/L			11/27/20 12:47	5
Sulfate	**149**		5.00	3.55	mg/L			11/20/20 14:36	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00103**		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:43	1
Arsenic	**0.00417**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:43	1
Barium	**0.0388**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:43	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:43	1
Boron	**0.825**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:43	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:43	1
Calcium	**31.0**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:43	1
Chromium	**0.0267**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:43	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:43	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:43	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:43	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:43	1
Lithium	**0.0117**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:43	1
Molybdenum	**0.0245**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:43	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:43	1
Selenium	**0.0381**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:43	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:43	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:44	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**362**		30.0	26.0	mg/L			11/20/20 16:08	1

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-8

Date Collected: 11/16/20 17:20
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-10

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**25.1**		5.00	2.00	mg/L			11/20/20 15:23	5
Nitrate as N	**10.0**	**H H3**	0.500	0.245	mg/L			11/20/20 15:23	5
Fluoride	**0.886**		0.500	0.230	mg/L			11/27/20 13:02	5
Sulfate	**154**		5.00	3.55	mg/L			11/20/20 15:23	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:48	1
Arsenic	**0.00329**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:48	1
Barium	**0.0383**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:48	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:48	1
Boron	**0.879**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:48	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:48	1
Calcium	**32.1**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:48	1
Chromium	**0.0445**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:48	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:48	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:48	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:48	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:48	1
Lithium	**0.0103**		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:48	1
Molybdenum	**0.0318**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:48	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:48	1
Selenium	**0.0408**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:48	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:48	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**380**		30.0	26.0	mg/L			11/20/20 16:08	1

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-9

Date Collected: 11/16/20 12:50
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-11

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**23.5**		5.00	2.00	mg/L			11/20/20 15:54	5
Nitrate as N	**9.81**	**H H3**	0.500	0.245	mg/L			11/20/20 15:54	5
Fluoride	**1.14**		0.500	0.230	mg/L			11/27/20 13:18	5
Sulfate	**121**		5.00	3.55	mg/L			11/20/20 15:54	5

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:51	1
Arsenic	**0.00280**		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:51	1
Barium	**0.0431**		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:51	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:51	1
Boron	**1.37**		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:51	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:51	1
Calcium	**27.2**		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:51	1
Chromium	**0.0469**		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:51	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:51	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:51	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:51	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:51	1
Lithium	**0.00990**	**J**	0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:51	1
Molybdenum	**0.0241**		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:51	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:51	1
Selenium	**0.0751**		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:51	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:51	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:48	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	**332**		30.0	26.0	mg/L			11/20/20 16:08	1

Client Sample Results

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-01FB

Date Collected: 11/16/20 16:42
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-12

Matrix: Water

Method: 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00	0.400	mg/L			11/20/20 15:39	1
Nitrate as N	<0.100	H H3	0.100	0.0490	mg/L			11/20/20 15:39	1
Fluoride	<0.100	*	0.100	0.0460	mg/L			11/20/20 15:39	1
Sulfate	<1.00		1.00	0.710	mg/L			11/20/20 15:39	1

Method: 6020A - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 19:54	1
Arsenic	<0.00200		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 19:54	1
Barium	<0.00200		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 19:54	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 19:54	1
Boron	<0.100		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 19:54	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 19:54	1
Calcium	<0.500		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 19:54	1
Chromium	<0.00500		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 19:54	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 19:54	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 19:54	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 19:54	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 19:54	1
Lithium	<0.0100		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 19:54	1
Molybdenum	<0.00200		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 19:54	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 19:54	1
Selenium	<0.00500		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 19:54	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 19:54	1

Method: 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00	1.70	mg/L			11/20/20 14:08	1
Total Dissolved Solids	<30.0		30.0	26.0	mg/L			11/20/20 16:08	1

Definitions/Glossary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Qualifiers

HPLC/IC

Qualifier	Qualifier Description
*	LCS or LCSD is outside acceptance limits.
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.

General Chemistry

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

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-300460/3
Matrix: Water
Analysis Batch: 300460

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	0.400	mg/L			11/20/20 08:13	1
Nitrate as N	<0.100		0.100	0.0490	mg/L			11/20/20 08:13	1
Fluoride	<0.100		0.100	0.0460	mg/L			11/20/20 08:13	1
Sulfate	<1.00		1.00	0.710	mg/L			11/20/20 08:13	1

Lab Sample ID: LCS 310-300460/4
Matrix: Water
Analysis Batch: 300460

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	9.808		mg/L		98	90 - 110
Nitrate as N	2.00	2.134		mg/L		107	90 - 110
Fluoride	2.00	2.227	*	mg/L		111	90 - 110
Sulfate	10.0	10.25		mg/L		102	90 - 110

Lab Sample ID: 310-195772-12 MS
Matrix: Water
Analysis Batch: 300460

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	<1.00		5.00	4.625		mg/L		93	80 - 120
Nitrate as N	<0.100	H H3	1.00	1.025		mg/L		102	80 - 120
Fluoride	<0.100	*	1.00	1.095		mg/L		109	80 - 120
Sulfate	<1.00		5.00	4.996		mg/L		100	80 - 120

Lab Sample ID: 310-195772-12 MSD
Matrix: Water
Analysis Batch: 300460

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	<1.00		5.00	4.489		mg/L		90	80 - 120	3	15
Nitrate as N	<0.100	H H3	1.00	1.008		mg/L		101	80 - 120	2	15
Fluoride	<0.100	*	1.00	1.082		mg/L		108	80 - 120	1	15
Sulfate	<1.00		5.00	4.862		mg/L		97	80 - 120	3	15

Lab Sample ID: MB 310-301158/3
Matrix: Water
Analysis Batch: 301158

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	0.400	mg/L			11/27/20 08:53	1
Fluoride	<0.100		0.100	0.0460	mg/L			11/27/20 08:53	1
Sulfate	<1.00		1.00	0.710	mg/L			11/27/20 08:53	1

Lab Sample ID: LCS 310-301158/4
Matrix: Water
Analysis Batch: 301158

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	9.819		mg/L		98	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 310-301158/4
Matrix: Water
Analysis Batch: 301158

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.00	2.055		mg/L		103	90 - 110
Sulfate	10.0	9.915		mg/L		99	90 - 110

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 310-300245/1-A
Matrix: Water
Analysis Batch: 300579

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 300245

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00100		0.00100	0.000510	mg/L		11/23/20 08:09	11/24/20 18:38	1
Arsenic	<0.00200		0.00200	0.000880	mg/L		11/23/20 08:09	11/24/20 18:38	1
Barium	<0.00200		0.00200	0.000280	mg/L		11/23/20 08:09	11/24/20 18:38	1
Beryllium	<0.00100		0.00100	0.000270	mg/L		11/23/20 08:09	11/24/20 18:38	1
Boron	<0.100		0.100	0.0800	mg/L		11/23/20 08:09	11/24/20 18:38	1
Cadmium	<0.000100		0.000100	0.0000490	mg/L		11/23/20 08:09	11/24/20 18:38	1
Calcium	<0.500		0.500	0.190	mg/L		11/23/20 08:09	11/24/20 18:38	1
Chromium	<0.00500		0.00500	0.00110	mg/L		11/23/20 08:09	11/24/20 18:38	1
Cobalt	<0.000500		0.000500	0.0000910	mg/L		11/23/20 08:09	11/24/20 18:38	1
Copper	<0.00500		0.00500	0.00150	mg/L		11/23/20 08:09	11/24/20 18:38	1
Iron	<0.100		0.100	0.0500	mg/L		11/23/20 08:09	11/24/20 18:38	1
Lead	<0.000500		0.000500	0.000110	mg/L		11/23/20 08:09	11/24/20 18:38	1
Lithium	<0.0100		0.0100	0.00250	mg/L		11/23/20 08:09	11/24/20 18:38	1
Molybdenum	<0.00200		0.00200	0.00110	mg/L		11/23/20 08:09	11/24/20 18:38	1
Nickel	<0.00500		0.00500	0.00190	mg/L		11/23/20 08:09	11/24/20 18:38	1
Selenium	<0.00500		0.00500	0.00100	mg/L		11/23/20 08:09	11/24/20 18:38	1
Thallium	<0.00100		0.00100	0.000260	mg/L		11/23/20 08:09	11/24/20 18:38	1

Lab Sample ID: LCS 310-300245/2-A
Matrix: Water
Analysis Batch: 300579

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 300245

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.200	0.2002		mg/L		100	80 - 120
Arsenic	0.200	0.1966		mg/L		98	80 - 120
Barium	0.100	0.1053		mg/L		105	80 - 120
Beryllium	0.100	0.09715		mg/L		97	80 - 120
Boron	0.200	0.1895		mg/L		95	80 - 120
Cadmium	0.100	0.09611		mg/L		96	80 - 120
Calcium	2.00	1.713		mg/L		86	80 - 120
Chromium	0.100	0.09654		mg/L		97	80 - 120
Cobalt	0.100	0.09775		mg/L		98	80 - 120
Copper	0.200	0.2006		mg/L		100	80 - 120
Iron	0.200	0.2006		mg/L		100	80 - 120
Lead	0.200	0.2032		mg/L		102	80 - 120
Lithium	0.200	0.1998		mg/L		100	80 - 120
Molybdenum	0.200	0.1929		mg/L		96	80 - 120
Nickel	0.200	0.1985		mg/L		99	80 - 120
Selenium	0.400	0.3876		mg/L		97	80 - 120

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

Lab Sample ID: 310-195772-9 DU
Matrix: Water
Analysis Batch: 300579

Client Sample ID: MW-7
Prep Type: Total/NA
Prep Batch: 300245

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Antimony	0.00103		<0.00100		mg/L		NC	20
Arsenic	0.00417		0.004055		mg/L		3	20
Barium	0.0388		0.03915		mg/L		1	20
Beryllium	<0.00100		<0.00100		mg/L		NC	20
Boron	0.825		0.8282		mg/L		0.4	20
Cadmium	<0.000100		<0.000100		mg/L		NC	20
Calcium	31.0		30.96		mg/L		0	20
Chromium	0.0267		0.02648		mg/L		1	20
Cobalt	<0.000500		<0.000500		mg/L		NC	20
Copper	<0.00500		<0.00500		mg/L		NC	20
Iron	<0.100		<0.100		mg/L		NC	20
Lead	<0.000500		<0.000500		mg/L		NC	20
Lithium	0.0117		0.01084		mg/L		8	20
Molybdenum	0.0245		0.02440		mg/L		0.5	20
Nickel	<0.00500		<0.00500		mg/L		NC	20
Selenium	0.0381		0.03861		mg/L		1	20
Thallium	<0.00100		<0.00100		mg/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 310-300931/1-A
Matrix: Water
Analysis Batch: 301119

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 300931

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.000200		0.000200	0.000100	mg/L		12/01/20 09:45	12/02/20 10:05	1

Lab Sample ID: LCS 310-300931/2-A
Matrix: Water
Analysis Batch: 301119

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 300931

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00167	0.001623		mg/L		97	80 - 120

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

Lab Sample ID: MB 310-300138/1
Matrix: Water
Analysis Batch: 300138

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			11/20/20 14:08	1

Lab Sample ID: LCS 310-300138/2
Matrix: Water
Analysis Batch: 300138

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	103.0		mg/L		103	74 - 114

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

Lab Sample ID: MB 310-300155/1
Matrix: Water
Analysis Batch: 300155

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	<30.0		30.0	26.0	mg/L			11/20/20 16:08	1

Lab Sample ID: LCS 310-300155/2
Matrix: Water
Analysis Batch: 300155

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	992.0		mg/L		99	90 - 110		

Lab Sample ID: 310-195772-1 DU
Matrix: Water
Analysis Batch: 300155

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

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids	294			360.0		mg/L				20	24

Lab Sample ID: MB 310-300335/1
Matrix: Water
Analysis Batch: 300335

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	<30.0		30.0	26.0	mg/L			11/23/20 16:30	1

Lab Sample ID: LCS 310-300335/2
Matrix: Water
Analysis Batch: 300335

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	966.0		mg/L		97	90 - 110		

QC Association Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

HPLC/IC

Analysis Batch: 300460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	9056A	
310-195772-2	MW-2B	Total/NA	Water	9056A	
310-195772-3	MW-102B	Total/NA	Water	9056A	
310-195772-4	MW-3R	Total/NA	Water	9056A	
310-195772-5	MW-103	Total/NA	Water	9056A	
310-195772-6	MW-4B	Total/NA	Water	9056A	
310-195772-7	MW-5B	Total/NA	Water	9056A	
310-195772-8	MW-6	Total/NA	Water	9056A	
310-195772-9	MW-7	Total/NA	Water	9056A	
310-195772-10	MW-8	Total/NA	Water	9056A	
310-195772-11	MW-9	Total/NA	Water	9056A	
310-195772-12	MW-01FB	Total/NA	Water	9056A	
MB 310-300460/3	Method Blank	Total/NA	Water	9056A	
LCS 310-300460/4	Lab Control Sample	Total/NA	Water	9056A	
310-195772-12 MS	MW-01FB	Total/NA	Water	9056A	
310-195772-12 MSD	MW-01FB	Total/NA	Water	9056A	

Analysis Batch: 301158

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	9056A	
310-195772-2	MW-2B	Total/NA	Water	9056A	
310-195772-6	MW-4B	Total/NA	Water	9056A	
310-195772-7	MW-5B	Total/NA	Water	9056A	
310-195772-8	MW-6	Total/NA	Water	9056A	
310-195772-9	MW-7	Total/NA	Water	9056A	
310-195772-10	MW-8	Total/NA	Water	9056A	
310-195772-11	MW-9	Total/NA	Water	9056A	
MB 310-301158/3	Method Blank	Total/NA	Water	9056A	
LCS 310-301158/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 300245

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	3010A	
310-195772-2	MW-2B	Total/NA	Water	3010A	
310-195772-3	MW-102B	Total/NA	Water	3010A	
310-195772-4	MW-3R	Total/NA	Water	3010A	
310-195772-5	MW-103	Total/NA	Water	3010A	
310-195772-6	MW-4B	Total/NA	Water	3010A	
310-195772-7	MW-5B	Total/NA	Water	3010A	
310-195772-8	MW-6	Total/NA	Water	3010A	
310-195772-9	MW-7	Total/NA	Water	3010A	
310-195772-10	MW-8	Total/NA	Water	3010A	
310-195772-11	MW-9	Total/NA	Water	3010A	
310-195772-12	MW-01FB	Total/NA	Water	3010A	
MB 310-300245/1-A	Method Blank	Total/NA	Water	3010A	
LCS 310-300245/2-A	Lab Control Sample	Total/NA	Water	3010A	
310-195772-9 DU	MW-7	Total/NA	Water	3010A	

Metals

Analysis Batch: 300579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	6020A	300245
310-195772-2	MW-2B	Total/NA	Water	6020A	300245
310-195772-3	MW-102B	Total/NA	Water	6020A	300245
310-195772-4	MW-3R	Total/NA	Water	6020A	300245
310-195772-5	MW-103	Total/NA	Water	6020A	300245
310-195772-6	MW-4B	Total/NA	Water	6020A	300245
310-195772-7	MW-5B	Total/NA	Water	6020A	300245
310-195772-8	MW-6	Total/NA	Water	6020A	300245
310-195772-9	MW-7	Total/NA	Water	6020A	300245
310-195772-10	MW-8	Total/NA	Water	6020A	300245
310-195772-11	MW-9	Total/NA	Water	6020A	300245
310-195772-12	MW-01FB	Total/NA	Water	6020A	300245
MB 310-300245/1-A	Method Blank	Total/NA	Water	6020A	300245
LCS 310-300245/2-A	Lab Control Sample	Total/NA	Water	6020A	300245
310-195772-9 DU	MW-7	Total/NA	Water	6020A	300245

Prep Batch: 300931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	7470A	
310-195772-2	MW-2B	Total/NA	Water	7470A	
310-195772-3	MW-102B	Total/NA	Water	7470A	
310-195772-4	MW-3R	Total/NA	Water	7470A	
310-195772-5	MW-103	Total/NA	Water	7470A	
310-195772-6	MW-4B	Total/NA	Water	7470A	
310-195772-7	MW-5B	Total/NA	Water	7470A	
310-195772-8	MW-6	Total/NA	Water	7470A	
310-195772-9	MW-7	Total/NA	Water	7470A	
310-195772-10	MW-8	Total/NA	Water	7470A	
310-195772-11	MW-9	Total/NA	Water	7470A	
310-195772-12	MW-01FB	Total/NA	Water	7470A	
MB 310-300931/1-A	Method Blank	Total/NA	Water	7470A	
LCS 310-300931/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 301119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	7470A	300931
310-195772-2	MW-2B	Total/NA	Water	7470A	300931
310-195772-3	MW-102B	Total/NA	Water	7470A	300931
310-195772-4	MW-3R	Total/NA	Water	7470A	300931
310-195772-5	MW-103	Total/NA	Water	7470A	300931
310-195772-6	MW-4B	Total/NA	Water	7470A	300931
310-195772-7	MW-5B	Total/NA	Water	7470A	300931
310-195772-8	MW-6	Total/NA	Water	7470A	300931
310-195772-9	MW-7	Total/NA	Water	7470A	300931
310-195772-10	MW-8	Total/NA	Water	7470A	300931
310-195772-11	MW-9	Total/NA	Water	7470A	300931
310-195772-12	MW-01FB	Total/NA	Water	7470A	300931
MB 310-300931/1-A	Method Blank	Total/NA	Water	7470A	300931
LCS 310-300931/2-A	Lab Control Sample	Total/NA	Water	7470A	300931

General Chemistry

Analysis Batch: 300138

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	I-3765-85	
310-195772-2	MW-2B	Total/NA	Water	I-3765-85	
310-195772-3	MW-102B	Total/NA	Water	I-3765-85	
310-195772-4	MW-3R	Total/NA	Water	I-3765-85	
310-195772-5	MW-103	Total/NA	Water	I-3765-85	
310-195772-6	MW-4B	Total/NA	Water	I-3765-85	
310-195772-7	MW-5B	Total/NA	Water	I-3765-85	
310-195772-8	MW-6	Total/NA	Water	I-3765-85	
310-195772-9	MW-7	Total/NA	Water	I-3765-85	
310-195772-10	MW-8	Total/NA	Water	I-3765-85	
310-195772-11	MW-9	Total/NA	Water	I-3765-85	
310-195772-12	MW-01FB	Total/NA	Water	I-3765-85	
MB 310-300138/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-300138/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 300155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-1	MW-01	Total/NA	Water	SM 2540C	
310-195772-4	MW-3R	Total/NA	Water	SM 2540C	
310-195772-5	MW-103	Total/NA	Water	SM 2540C	
310-195772-6	MW-4B	Total/NA	Water	SM 2540C	
310-195772-7	MW-5B	Total/NA	Water	SM 2540C	
310-195772-8	MW-6	Total/NA	Water	SM 2540C	
310-195772-9	MW-7	Total/NA	Water	SM 2540C	
310-195772-10	MW-8	Total/NA	Water	SM 2540C	
310-195772-11	MW-9	Total/NA	Water	SM 2540C	
310-195772-12	MW-01FB	Total/NA	Water	SM 2540C	
MB 310-300155/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-300155/2	Lab Control Sample	Total/NA	Water	SM 2540C	
310-195772-1 DU	MW-01	Total/NA	Water	SM 2540C	

Analysis Batch: 300335

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-195772-2	MW-2B	Total/NA	Water	SM 2540C	
310-195772-3	MW-102B	Total/NA	Water	SM 2540C	
MB 310-300335/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 310-300335/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-01
Date Collected: 11/16/20 16:40
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 12:32	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 11:29	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:11	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:22	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-2B
Date Collected: 11/18/20 13:45
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 12:47	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 11:45	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:14	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:24	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300335	11/23/20 16:30	SAS	TAL CF

Client Sample ID: MW-102B
Date Collected: 11/18/20 08:30
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 13:03	ACJ	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:17	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:27	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300335	11/23/20 16:30	SAS	TAL CF

Client Sample ID: MW-3R
Date Collected: 11/16/20 15:15
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 13:19	ACJ	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:19	SAD	TAL CF

Client Sample ID: MW-3R
Date Collected: 11/16/20 15:15
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:29	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-103
Date Collected: 11/16/20 10:50
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 13:34	ACJ	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:22	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:31	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-4B
Date Collected: 11/16/20 14:20
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 13:50	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 12:00	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:25	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:33	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-5B
Date Collected: 11/16/20 12:10
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 14:05	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 12:16	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:27	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:35	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-5B
Date Collected: 11/16/20 12:10
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-6
Date Collected: 11/16/20 13:30
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 14:51	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 12:31	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:30	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:37	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-7
Date Collected: 11/16/20 16:00
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 14:36	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 12:47	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:43	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:44	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-8
Date Collected: 11/16/20 17:20
Date Received: 11/20/20 09:05

Lab Sample ID: 310-195772-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 15:23	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 13:02	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:48	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:46	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Lab Chronicle

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Client Sample ID: MW-9

Lab Sample ID: 310-195772-11

Date Collected: 11/16/20 12:50

Matrix: Water

Date Received: 11/20/20 09:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	300460	11/20/20 15:54	ACJ	TAL CF
Total/NA	Analysis	9056A		5	301158	11/27/20 13:18	CJT	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:51	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:48	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Client Sample ID: MW-01FB

Lab Sample ID: 310-195772-12

Date Collected: 11/16/20 16:42

Matrix: Water

Date Received: 11/20/20 09:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	300460	11/20/20 15:39	ACJ	TAL CF
Total/NA	Prep	3010A			300245	11/23/20 08:09	HED	TAL CF
Total/NA	Analysis	6020A		1	300579	11/24/20 19:54	SAD	TAL CF
Total/NA	Prep	7470A			300931	12/01/20 09:45	CJT	TAL CF
Total/NA	Analysis	7470A		1	301119	12/02/20 10:50	CJT	TAL CF
Total/NA	Analysis	I-3765-85		1	300138	11/20/20 14:08	LBB	TAL CF
Total/NA	Analysis	SM 2540C		1	300155	11/20/20 16:08	SAS	TAL CF

Laboratory References:

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

Accreditation/Certification Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Laboratory: Eurofins TestAmerica, Cedar Falls

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

Authority	Program	Identification Number	Expiration Date
Colorado	Petroleum Storage Tank Program	IA100001 (OR)	09-29-21
Georgia	State	IA100001 (OR)	09-29-21
Illinois	NELAP	200024	11-29-21
Iowa	State	007	12-01-21
Kansas	NELAP	E-10341	01-31-21
Minnesota	NELAP	019-999-319	12-31-21
Minnesota (Petrofund)	State	3349	08-22-21
North Dakota	State	R-186	09-29-21
Oregon	NELAP	IA100001	09-29-21
USDA	US Federal Programs	P330-19-00003	01-02-22

Method Summary

Client: Hastings Utilities
Project/Site: MEC MW Sampling

Job ID: 310-195772-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	TAL CF
6020A	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	TAL CF
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL 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:

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

eurofins | Environment Testing TestAmerica

310-195772 Chain of Custody

Cooler/Sample Receipt and Temperature

Client Information

Client: PDGA

City/State: CITY Hastings STATE NE Project: WECMN Sampling

Receipt Information

Date/Time Received: DATE 11.20.20 TIME 905 Received By: BKM

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: N Correction Factor (°C): +0.0

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

Uncorrected Temp (°C): 1.2 Corrected Temp (°C): 1.2

- Sample Container Temperature

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

Exceptions Noted

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

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

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

Additional Comments

TestAmerica Cedar Falls
704 Enterprise Drive

Cedar Falls, IA 50613
phone 319.277.2401 fax 319.277.2425

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other:

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Jenny Sidlo	Site Contact:	Date:	COC No:
PPGA	Tel/Fax:	Lab Contact:	Carrier:	1 of 1 COCs
	Analysis Turnaround Time			Sampler:
Hastings, NE 68901	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(xxx) xxx-xxxx Phone	TAT if different from Below _____			Walk-in Client:
(xxx) xxx-xxxx FAX	☐ 2 weeks			Lab Sampling:
Project Name: WEC MW Sampling	☐ 1 week			
CCR wells	☐ 2 days			Job / SDG No.:
P O #6041	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS/MSD (Y/N)	Metals	Iron	Sulfate	TDS	Molybdenum	Selenium	Lithium	Mercury	Chloride	Fluoride	Total Boron	Total Calcium	TSS	Nitrate				Sample Specific Notes:
MW-01	11/16/20	16:40	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-2B	11/18/20	13:45	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-102B	11/18/20	8:30	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-3R	11/16/20	15:15	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-103	11/16/20	10:50	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-4B	11/16/20	14:20	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-5B	11/16/20	12:10	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-6	11/16/20	13:30	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-7	11/16/20	16:00	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-8	11/16/20	17:20	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-9	11/16/20	12:50	G		2	N		X	X	X	X	X	X	X	X	X	X	X	X	X	X				
MW-01 FB	11-1620	16:42	G		2	N		X	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

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

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

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

Report only this cooler COC together.

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd:_____ Corr'd:_____	Therm ID No.:_____
Relinquished by:	Company: Hastings Utilities	11-19-20 13:00	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company: ETA	Date/Time: 11/20/20 9:05

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

Login Sample Receipt Checklist

Client: Hastings Utilities

Job Number: 310-195772-1

Login Number: 195772
List Number: 1
Creator: Marzen, Brita K

List Source: Eurofins TestAmerica, 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)	False	Refer to Job Narrative for details.
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	

Appendix C

Spring and Fall 2020
Statistical Analysis Memos

This page intentionally left blank.

Memo

Date:	Monday, June 15, 2020
To:	Public Power Generation Agency (PPGA)
From:	HDR Engineering, Inc.
Subject:	Summary of Statistical Analysis and Evaluation for SSIs and SSLs WEC Temporary Ash Disposal Area CCR Groundwater Monitoring Network

Whelan Energy Center (WEC) operated by Hastings Utilities 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 Hastings Naval Ammunition Depot (NAD) and as such is included in the Superfund activities for this subsite of the Hasting Groundwater Contamination Superfund Site. The Superfund actions include groundwater and soil restoration. Buried by-products 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 Utilities. WEC Unit No. 2 (WEC2) is owned by Public Power Generation Agency (PPGA) of which Hastings Utilities 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.

On March 1 2018, WEC published statistically significant increases (SSIs) in downgradient monitoring wells at the WEC Temporary Ash Disposal Area (WEC, 2018). An alternative source demonstration (ASD) evaluation was conducted for the published SSIs (dated May 1, 2018). The ASD evaluation did not fully demonstrate an alternative source for all of the detected SSIs. As a result, WEC initiated an assessment monitoring program, as required in the CCR Rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in §257.95. Groundwater sampling was completed as part of an assessment monitoring program for the WEC Temporary Ash Disposal Area in July 2018 [as specified in §257.95(b)] and October 2018 [as specified in §257.95(d)].

The May 2020 sampling event was analyzed for all parameters in the Appendix III and Appendix IV list, as specified in §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 SAP, dated February 21, 2020. Sampling results used to calculate background threshold values (BTVs) were obtained during monitoring events performed between November 2016 and October 2018. Background data sets will be updated every two years, as recommended by the EPA's Unified Guidance (EPA 2009).

Downgradient sampling results from the spring 2020 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 over background for the Appendix III and Appendix IV constituents are provided in Table D-1.

Table D-1. 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) – May 2020*					
Appendix III Constituents								
Boron	*1.61*	*mg/L*	1.35	0.600	0.971	0.990	1.47	1.22
Calcium	*77.1*	*mg/L*	36.2	**86.8**	**90.8**	45.3	39.5	32.3
Chloride	*34.1*	*mg/L*	26.7	27.1	**34.8**	26.7	27.2	26.3
Fluoride	*1.34*	*mg/L*	0.587	0.534	0.401J	0.665	0.517	**1.36**
pH	*6.39 – 7.32**	*SU*	**5.34**	**5.15**	**5.53**	**5.24**	**5.17**	6.57
Sulfate	*215*	*mg/L*	158	149	**278**	156	145	140
TDS	*603*	*mg/L*	390	472	**622**	396	450	348
Appendix IV Constituents								
Antimony	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Arsenic	0.00686	mg/l	0.00459	0.00237	0.00239	0.00286	0.00415	0.00400
Barium	0.063	mg/l	**0.0770**	**0.193**	**0.0905**	0.0349	0.0407	0.0358
Beryllium	0.001	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	0.0005	mg/l	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	0.0000880J
Chromium	0.0455	mg/l	0.0327	0.0183	0.0100	0.0216	0.0264	0.0380
Cobalt	0.0005	mg/l	0.000119J	0.000347J	0.000188J	<0.000500	0.0000910J	0.000102J
Fluoride	1.34	mg/l	0.587	0.534	0.401J	0.665	0.517	**1.36**
Lead	0.0207	mg/l	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	0.000302J
Lithium	0.0164	mg/l	0.0107	0.0145	**0.0306**	**0.0228**	0.00936J	0.00837J
Mercury	0.0002	mg/l	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	0.0373	mg/l	**0.0441**	0.00356	0.00593	0.0188	0.0255	0.0371
Radium 226+228 [1]	2.07	pCi/l	1.32	**2.12**	1.49	1.85	1.56	0.708
Selenium	0.121	mg/l	0.0668	0.0363	0.0606	0.0416	0.0421	0.0293
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 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.
[1] 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.

The calculated lower confidence levels (LCLs) and the evaluation for SSLs over the GWPS for the Appendix IV constituents are provided in Table D-2. As shown in Table D-2, no Appendix IV constituents were detected over the GWPS during the spring 2020 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring during the fall 2020 sampling event.

Table D-2. Summary of Evaluation for SSLs over GWPS

		Well ID:	MW-1	MW-2B	MW-3R	MW-4B	MW-7	MW-8
Constituent	*GWPS*	*Unit*	*Confidence Intervals in accordance with §257.95(d)(1)*					
Antimony	*0.006* [1]	*mg/L*	0.000207	0.00058	0.000192	0.00058	0.00058	0.00058
Arsenic	*0.01* [1]	*mg/L*	0.003567	0.002101	0.002307	0.002576	0.003435	0.003858
Barium	*2.00* [1]	*mg/L*	0.07547	0.167	0.07709	0.03293	0.05667	0.0436
Beryllium	*0.004* [1]	*mg/L*	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Cadmium	*0.005* [1]	*mg/L*	0.000039	0.000039	0.000039	0.000039	0.000039	0.000039
Chromium	*0.1* [1]	*mg/L*	0.0301	0.01624	0.005532	0.004696	0.00827	0.03431
Cobalt	*0.006* [1]	*mg/L*	0.000091	0.000091	0.000091	0.000091	0.000091	0.000091
Fluoride	*4.00* [1]	*mg/L*	0.259	0.26	0.25	0.23	0.254	0.7618
Lead	*0.0207* [2]	*mg/L*	0.00027	0.00027	0.00027	0.00027	0.00027	0.00027
Lithium	*0.04* [1]	*mg/L*	0.01117	0.01343	0.02616	0.02862	0.01364	0.01086
Mercury	*0.002* [1]	*mg/L*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Molybdenum	*0.100* [1]	*mg/L*	0.03474	0.00251	0.003465	0.004357	0.02006	0.0387
Radium 226+228 [3]	*5.00* [1]	*pCi/L*	1.02	1.307	0.9599	0.5503	0.9688	0.4876
Selenium	*0.122* [2]	*mg/L*	0.0394	0.0341	0.032	0.02389	0.051	0.0374
Thallium	*0.002* [1]	*mg/L*	0.00026	0.00026	0.00026	0.00026	0.00026	0.00026

[1] GWPS is established as the U.S. EPA Maximum Contaminant Level (MCL) or the GWPS specified in §257.95(h)(2).
[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.
[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.

This page intentionally left blank.

Memo

Date:	Friday, January 29, 2021
To:	Public Power Generation Agency (PPGA)
From:	HDR Engineering, Inc.
Subject:	Summary of Statistical Analysis and Evaluation for SSIs and SSLs WEC Temporary Ash Disposal Area CCR Groundwater Monitoring Network

Whelan Energy Center (WEC), operated by City of Hastings Utilities (Hastings), 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 Hastings Naval Ammunition Depot (NAD) and as such is included in the Superfund activities for this subsite of the Hasting Groundwater Contamination Superfund Site. The Superfund actions include groundwater and soil restoration. Buried by-products 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.

On March 1, 2018, WEC published statistically significant increases (SSIs) in downgradient monitoring wells at the WEC Temporary Ash Disposal Area. An alternate source demonstration (ASD) was conducted for the published SSIs (dated May 1, 2018). The ASD did not fully demonstrate an alternate source for all of the detected SSIs at that time. As a result, WEC initiated an assessment monitoring program, as required by the CCR rule, for the WEC Temporary Ash Disposal Area within the 90-day period specified in 40 CFR §257.95. Groundwater sampling was conducted as part of an assessment monitoring program for the WEC Temporary Ash Disposal Area in July 2018, as specified in 40 CFR §257.95(b), and October 2018, as specified in 40 CFR §257.95(d).

The semiannual November 2020 sampling event was analyzed for all 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 February 21, 2020. Monitoring results used to calculate background threshold values (BTVs) were obtained during sampling events conducted between November 2016 and November 2020. 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 (2009).

Downgradient sampling results from the November 2020 assessment monitoring round 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 background for the Appendix III and Appendix IV constituents are provided in **Table 1**.

Table 1. 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)*					
Appendix III Constituents								
Boron	*1.71*	*mg/L*	0.969	0.562	0.925	1.05	0.825	0.879
Calcium	*78.8*	*mg/L*	28.2	**79.2**	64.4	37.6	31.0	32.1
Chloride	*35.2*	*mg/L*	24.8	26.1	33.1	24.7	26.4	25.1
Fluoride	*1.59*	*mg/L*	0.374J	<0.500	<0.500	0.609	0.658	0.886
pH	*6.15 – 7.53**	*SU*	6.83	6.95	6.58	6.79	6.75	7.25
Sulfate	*199*	*mg/L*	139	153	**237**	155	149	154
TDS	*591*	*mg/L*	294	474	522	368	362	380
Appendix IV Constituents								
Antimony	*0.001*	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	**0.00103**	<0.00100
Arsenic	*0.00666*	mg/l	0.00409	0.00203	0.00198J	0.00238	0.00417	0.00329
Barium	*0.0858*	mg/l	0.0627	**0.178**	0.0611	0.0310	0.0388	0.0383
Beryllium	*0.001*	mg/l	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100	<0.00100
Cadmium	*0.0001*	mg/l	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Chromium	*0.0514*	mg/l	0.0329	0.0172	0.0237	0.0246	0.0267	0.0445
Cobalt	*0.0005*	mg/l	<0.000500	<0.000500	**0.000668**	<0.000500	<0.000500	<0.000500
Fluoride	*1.59*	mg/l	0.374J	<0.500	<0.500	0.609	0.658	0.886
Lead	*0.0207*	mg/l	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500	<0.000500
Lithium	*0.0175*	mg/l	0.0101	0.0144	**0.0314**	0.0174	0.0117	0.0103
Mercury	*0.0002*	mg/l	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200	<0.000200
Molybdenum	*0.0489*	mg/l	0.0395	0.00267	0.0107	0.0185	0.0245	0.0318
Radium 226+228	*2.03*	pCi/l	**	**	**	**	**	**
Selenium	*0.158*	mg/l	0.0297	0.0372	0.0351	0.0372	0.0381	0.0408
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 is the lower prediction limit (LPL). The upper bound is the upper prediction limit (UPL).
** The contracted laboratory had not returned radium results at the time the 2020 annual CCR report was placed in the facility's operating record. This information will be provided as an addendum.
"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 2**. As shown in **Table 2**, no Appendix IV constituents were detected over the GWPS during the fall 2020 sampling event; therefore, the WEC Temporary Ash Disposal Area will remain in assessment monitoring for the spring 2021 sampling event.

Table 2. 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*	0.003622	0.002094	0.002275	0.002498	0.003499	0.003812
Barium	*2.00*	*mg/L*	0.07392	0.1675	0.07579	0.0328	0.05432	0.04264
Beryllium	*0.004*	*mg/L*	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium	*0.005*	*mg/L*	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Chromium	*0.1*	*mg/L*	0.03021	0.0163	0.005362	0.005768	0.00956	0.03519
Cobalt	*0.006*	*mg/L*	0.000129	0.000374	0.0003	0.0005	0.00045	0.000199
Fluoride	*4.00*	*mg/L*	0.29	0.3	0.29	0.2522	0.3408	0.7939
Lead	*0.0207 [2]*	*mg/L*	0.0005	0.0005	0.0005	0.0005	0.0005	0.000302
Lithium	*0.04*	*mg/L*	0.01106	0.01339	0.02648	0.02653	0.01322	0.0106
Mercury	*0.002*	*mg/L*	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Molybdenum	*0.100*	*mg/L*	0.03531	0.00251	0.00366	0.005621	0.02058	0.04179
Radium 226+228	*5.00*	*pCi/L*	**	**	**	**	**	**
Selenium	*0.158 [2]*	*mg/L*	0.0394	0.03424	0.03442	0.02593	0.04868	0.04271
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).
[2] GWPS is established as the upper tolerance limit when the background level is higher than the U.S. EPA MCL.
** The contracted laboratory had not returned radium results at the time the 2020 annual CCR report was placed in the facility's operating record. This information will be provided as an addendum.

This page intentionally left blank.