2019 Annual Groundwater Monitoring and Corrective Action Report

for Compliance with the Coal Combustion Residuals (CCR) Rule

Cherokee Station

Public Service Company of Colorado

January 31, 2020

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Table of Abbreviations and Acronyms

Abbreviation	Definition
BTV	background threshold value
CCR	Coal Combustion Residuals
COI	constituent of interest
EPA	Environmental Protection Agency
LCS	Laboratory Control Samples
MS/MSD	Matrix Spike/Duplicate
QC	quality control
RPD	relative percent difference
SOP	Standard Operating Procedure
SSI	statistically significant increase
SSL	statistically significant level
TDS	Total Dissolved Solids
TSS	Total Suspended Solids

Certification

2019 Groundwater Monitoring Annual Report for Cherokee Station

I hereby certify to the best of my knowledge that this groundwater monitoring annual report is designed to meet the performance standard in 40 CFR Part 257 of the Federal Coal Combustion Residuals (CCR) Rule.

I am duly licensed Professional Engineer under the laws of the State of Colorado.

COLORADO LICENSED
MATTHEW MICHAEL ROHR
53467
31JAN2020
PROFESSIONAL ENGINEER

Matthew Rohr, PE
Colorado PE License 0053467
License renewal date October 31, 2021

1.0 Introduction

The U.S. Environmental Protection Agency's (EPA's) final Coal Combustion Residuals (CCR) Rule establishes a comprehensive set of requirements for the management and disposal of CCR (or coal ash) in landfills and surface impoundments by electric utilities. Cherokee Station, located in Denver, Colorado (**Figure 1**), is owned and operated by Public Service Company of Colorado (PSCo), an Xcel Energy Company. Cherokee Station has four CCR units subject to the CCR Rule: the former West, Center, and East ash impoundments, and the former incised Cooling Tower Retention Pond (CTRP) (**Figure 2**). The CTRP was closed in 2017 and all ash impoundments were closed in 2018; all were physically closed by removal of CCR, with ongoing groundwater monitoring.

In 2019, groundwater monitoring was conducted at Cherokee to collect assessment monitoring samples at the (closed) CCR Ash Impoundments as specified under Part 257.95. The CTRP was categorized as inactive as of the October, 2015 effective date of the CCR Rule and became subject to the groundwater monitoring requirements under the Direct Final Rule effective October 4, 2016 (Extension Rule). For the former CTRP, background samples were collected in 2018 and 2019 and background threshold values (BTVs) were developed. Detection monitoring samples were collected for the CTRP and compared against the BTVs as specified under CCR Rule Part 257.94 and assessment monitoring was initiated as specified under Part 257.95 for this closed pond. This Annual Groundwater Monitoring Report presents the sampling and analysis completed in 2019:

- The status of the groundwater monitoring program for the (closed) West, Center, and East ash impoundments at the end of 2019 is in assessment monitoring.
- The status of the groundwater monitoring program for the (closed) CTRP at the end of 2019 is in assessment monitoring.

2.0 Facility Description

Historically, Cherokee Station was a coal-fired, steam turbine electric generating station; the fuel source for the coal-fired units was sub-bituminous, low-sulfur coal supplied by several mines in western Colorado. Cherokee Station ceased burning coal in August 2017, and is now reconfigured to natural gas. During the active coal operations, the former West, Center, and East ash impoundments (described herein as ash impoundments) were used for temporary storage of bottom ash. Fly ash was handled dry and collected in on-site silos. Both bottom ash and fly ash were hauled off site to facilities permitted for either beneficial use or disposal. The ash impoundments were physically closed by removal of all CCR, which was completed in December 2018; completion of CCR removal was certified by a Professional Engineer.

The CTRP historically received overflow from Cooling Tower 4 and CCR (**Figure 2**). The CTRP ceased receiving CCR prior to the October 2015 effective date of the CCR Rule and therefore met the definition of an inactive impoundment. The CTRP became subject to the groundwater monitoring requirements under the Direct Final Rule effective October 4, 2016. The pond was physically closed by removal of all CCR, which was completed in March 2017; completion of CCR removal was certified by a Professional Engineer.

The operation and monitoring of the CCR units are described further in the Cherokee Station Groundwater Monitoring System Certification (HDR, 2019).

2.1 Hydrogeology

The uppermost aquifer under Cherokee Station is the alluvial aquifer associated with the nearby South Platte River and is present across the site. Groundwater under the CCR facilities flows east, perpendicular to the South Platte River, where it ultimately discharges to the river (GeoTrans, Inc., 2009). In the area of the ash impoundments, the alluvial aquifer is between 8 and 38 feet thick, mostly sandy, and is underlain by the low permeability claystone deposits of the Denver Formation that inhibit vertical downward flow to the deeper, regional Arapahoe Aquifer (GeoTrans, Inc., 2009). The Denver Formation is over 70 feet thick in this area (CDH, 1993). Further hydrogeologic characterization of the site is provided in the Cherokee Station Groundwater Monitoring System Certification (HDR, 2019).

2.2 Monitoring Well Network

2.2.1 West, Center, and East Ash Impoundments

The CCR Rule requires, at a minimum, one upgradient and three downgradient monitoring wells per CCR unit to be completed in the uppermost aquifer. Section 257.9 of the Rule states that the operator: *"…may install a multiunit groundwater monitoring system instead of separate groundwater monitoring systems for each CCR unit."* In addition, the CCR Rule states that downgradient monitoring wells should be installed to: *"accurately represent the quality of groundwater passing the waste boundary of the CCR unit. The downgradient monitoring system must be installed at the waste boundary that ensures detection of groundwater contamination in the uppermost aquifer."* The flow of groundwater under the CCR impoundments is eastward, perpendicular to the length of the impoundments. Five wells were sited in 2015 for CCR compliance for a multiunit monitoring network of all three impoundments, two hydraulically upgradient monitoring wells (MW-7 and MW-13) and three downgradient monitoring wells (MW-8, MW-9, and MW-10) (**Figure 2**). The MW-7 well location on the west side of the former West Impoundment is hydraulically upgradient of the impoundments (GeoTrans, Inc., 2009); however, the monitoring performed to date has identified that the ponds may have influenced well MW-7; therefore the MW-7 well is not representative of background water. Monitoring well MW-13 is located upgradient of the CCR impoundments and serves as the background monitoring well for the former West, Center, and East ash impoundments **(Figure 2)**. No monitoring wells were installed or abandoned in 2019 for the former ash impoundments.

The three ash impoundments were closed by removal of all CCR after first dewatering the impoundments. All CCR was removed, exposing the native shale bedrock and native sands above the bedrock. Minor amounts of groundwater were observed on top of the native subgrade. During this time, three of the four monitoring wells adjacent to the impoundments were intermittently dry. These observations indicate that the water in the former ash impoundments was causing some groundwater mounding beneath the ponds and controlling water levels in the monitoring wells surrounding the ponds.

2.2.2 Cooling Tower Retention Pond

In 2018 four wells (MW-14, MW-15, MW-16, MW-17) were installed around the perimeter of the (closed) CTRP for CCR compliance (**Figure 2**). The groundwater flow direction beneath the pond is to the east. Monitoring wells MW-15, MW-16, and MW-17 were located along the perimeter of the east side of the pond to serve as downgradient wells at the waste boundary (**Figure 2**). No monitoring wells were installed or abandoned in 2019 for the former CTRP.

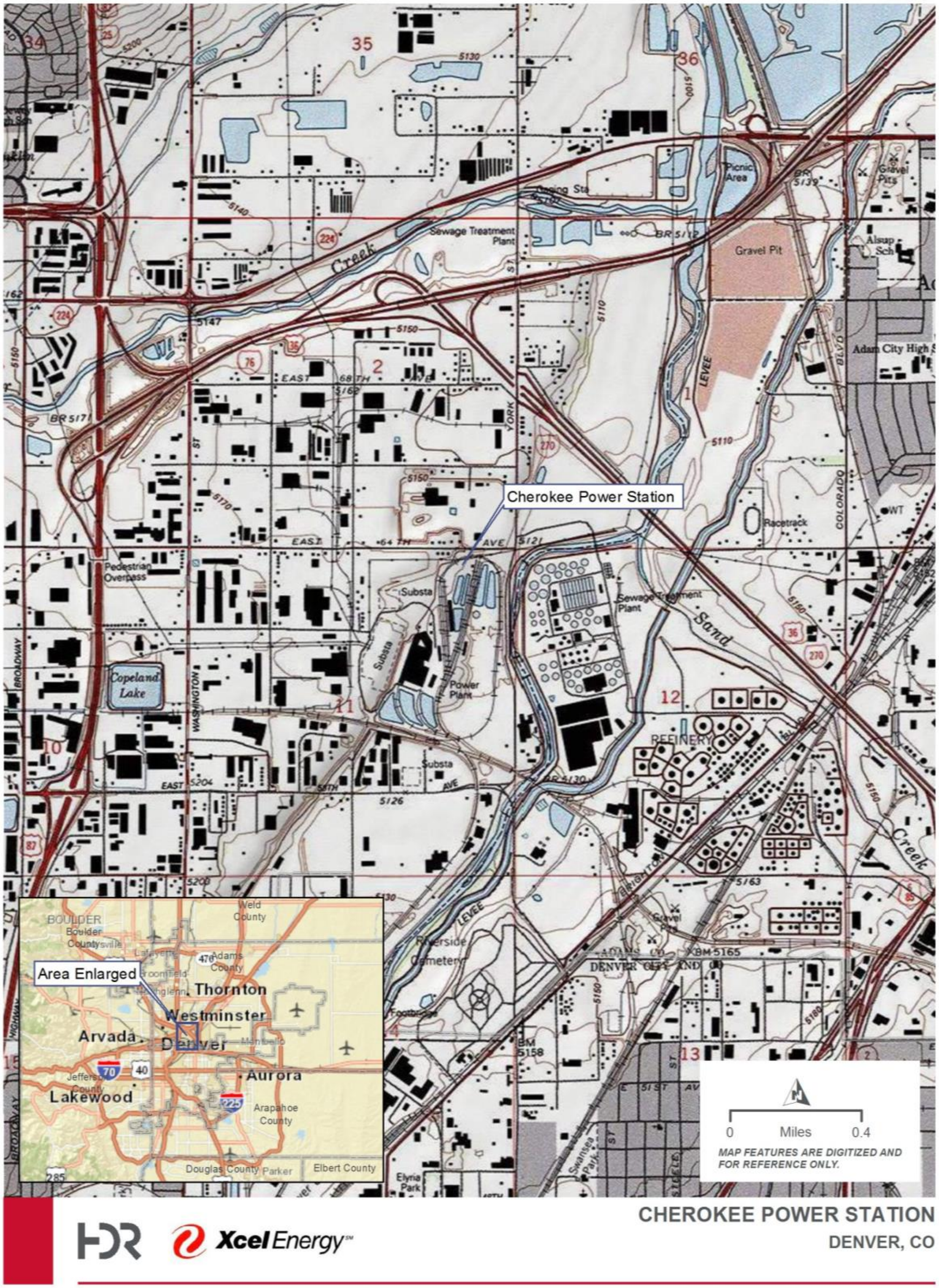

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Figure 1. Vicinity map for Cherokee Station.

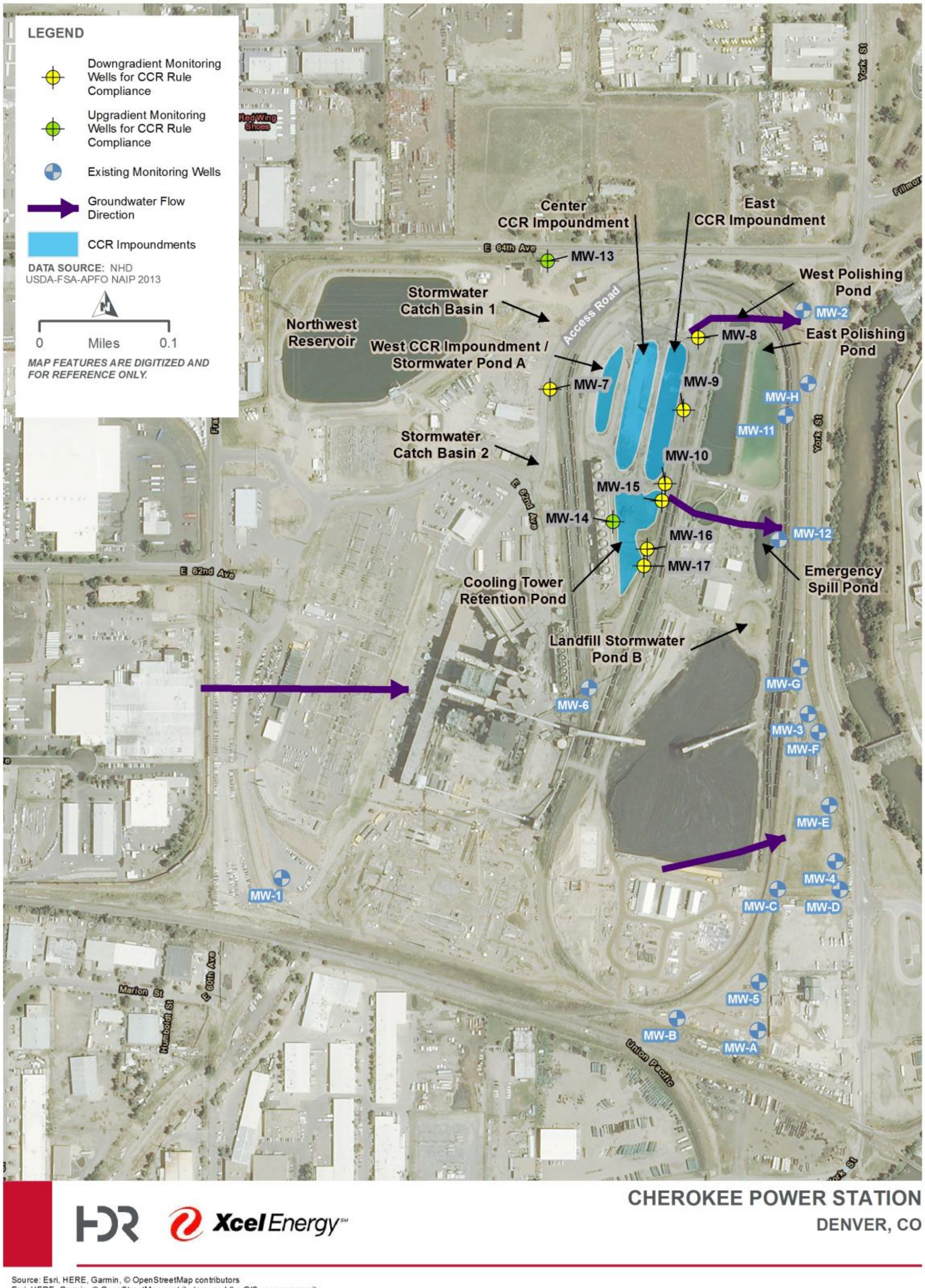


Figure 2. Cherokee Station – CCR unit and monitoring well location map.

3.0 Monitoring

3.1 Frequency

3.1.1 West, Center, and East Ash Impoundments

Assessment monitoring continued in 2019 for the former Ash Impoundments. An annual assessment monitoring event was completed June 4, 2019 to sample all of the monitoring wells around the impoundments for all Appendix III and IV constituents plus TSS (**Table 1**). Monitoring was performed at all of the certified monitoring network of wells (MW-7, MW-8, MW-9, MW-10, and MW-13); however MW-8 and MW-9 were dry, thus samples were collected from MW-7, MW-10, and MW-13. All Appendix IV constituents were detected in at least one well. **Table 2** provides the well identification, number of samples collected, dates samples were collected in 2019, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))). **Appendix A** provides the distinctions for the different types of monitoring events and the CCR Rule Part under which the monitoring event was conducted.

On December 9-10, 2019 semi-annual assessment monitoring was conducted at the former Ash Impoundments certified monitoring wells. Samples were analyzed for Appendix III and detected Appendix IV COIs plus TSS. Monitoring wells MW-8 and MW-9 were dry. Samples were collected from MW-7, MW-10, and MW-13 (**Table 2**).

Table 1. Groundwater quality parameters.

Appendix III Constituents for Detection Monitoring	**Appendix IV Constituents for Assessment Monitoring**
Boron	Antimony
Calcium	Arsenic
Chloride	Barium
Fluoride	Beryllium
pH	Cadmium
Sulfate	Chromium
Total Dissolved Solids (TDS)	Cobalt
Additional Parameters	Fluoride
Total Suspended Solids (TSS)	Lead
	Lithium
	Mercury
	Molybdenum
	Selenium
	Thallium
	Radium 226 and 228 combined

Table 2. Number and dates of groundwater samples collected in 2019 for each well and the required monitoring programs for the Cherokee Ash Ponds (257.90(e)(3))

Monitoring Well I.D.	Well Location	Dates Monitored	CCR Rule Monitoring Purpose
MW-7	Upgradient[1]	June 4, 2019	Annual Assessment Monitoring
		December 10, 2019	Semi-Annual Assessment Monitoring
MW-8	Downgradient	DRY - June 4, 2019	Annual Assessment Monitoring
		DRY - December 10, 2019	Semi-Annual Assessment Monitoring
MW-9	Downgradient	DRY - June 4, 2019	Annual Assessment Monitoring
		DRY - December 10, 2019	Semi-Annual Assessment Monitoring
MW-10	Downgradient	June 4, 2019	Annual Assessment Monitoring
		December 10, 2019	Semi-Annual Assessment Monitoring
MW-13	Upgradient / Background	April 10, 2019	Detection Monitoring Verification for the CTRP
		May 7, 2019	Detection Monitoring Verification for CTRP
		June, 3, 2019	Annual Assessment Monitoring
		October 22, 2019	Semi-Annual Assessment Monitoring for CTRP
		December 9, 2019	Semi-Annual Assessment Monitoring

[1]Hydraulically upgradient though potentially influenced by impoundments
*Well was monitored and found to be dry, no sample could be collected

3.1.2 Cooling Tower Retention Pond

As stipulated in the Direct Final Rule (Extension Rule), background monitoring and detection monitoring must be completed before April 17, 2019. Eight rounds of background groundwater sampling were completed between August 29, 2018 and January 16, 2019 for the (closed) CTRP from the certified monitoring well network (MW-14, MW-15, MW-16, and MW-17). Samples were analyzed for Appendix III and IV COIs plus TSS. Detection monitoring for the former CTRP was completed February 11-12, 2019. Samples were analyzed for Appendix III COIs. Detection Monitoring verification sampling for the CTRP was conducted on April 9-10, 2019, May 7, 2019, and June 4, 2019. **Table 3** provides the well identification, number of samples collected, dates samples were collected in 2019, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))).

The detection monitoring concentrations of Appendix III COIs from each downgradient monitoring well at the former CTRP were compared against the BTVs and several COIs were shown to have SSIs over BTVs (UPL). These SSIs triggered the assessment monitoring program for the CTRP. The initial assessment monitoring event was completed July 22-23, 2019 to sample all of the CTRP certified monitoring network wells for Appendix IV constituents (**Table 1 and Table 3**). Results from the initial assessment monitoring sample event identified the detected Appendix IV constituents. All Appendix IV constituents were detected in at least one well except for beryllium and mercury.

On October 22, 2019, the first semi-annual assessment monitoring samples were collected from all wells in the CTRP well network (**Table 3**). Samples were analyzed for Appendix III and detected Appendix IV COIs.

Table 3. Number and dates of groundwater samples collected in 2019 for each well and the required monitoring programs for the Cherokee (closed) Cooling Tower Retention Pond (257.90(e)(3))

Monitoring Well I.D.	Well Location	Dates Monitored	CCR Rule Monitoring Purpose
MW-14	Upgradient / Background	January 16, 2019	Background Monitoring (Post-CCR Removal)
		February 12, 2019	Detection Monitoring
		April 10, 2019	Detection Monitoring Verification
		May 7, 2019	Detection Monitoring Verification
		June 4, 2019	Detection Monitoring Verification
		July 23, 2019	Initial Assessment Monitoring
		October 22, 2019	Semi-Annual Assessment Monitoring
MW-15	Downgradient	January 15, 2019	Background Monitoring (Post-CCR Removal)
		February 11, 2019	Detection Monitoring
		April 9, 2019	Detection Monitoring Verification
		May 7, 2019	Detection Monitoring Verification
		July 23, 2019	Initial Assessment Monitoring
		October 21, 2019	Semi-Annual Assessment Monitoring
MW-16	Downgradient	January 15, 2019	Background Monitoring (Post-CCR Removal)
		February 11, 2019	Detection Monitoring
		April 9, 2019	Detection Monitoring Verification
		May 7, 2019	Detection Monitoring Verification
		July 22, 2019	Initial Assessment Monitoring
		October 22, 2019	Semi-Annual Assessment Monitoring
MW-17	Downgradient	January 15, 2019	Background Monitoring (Post-CCR Removal)
		February 11, 2019	Detection Monitoring
		April 9, 2019	Detection Monitoring Verification
		May 7, 2019	Detection Monitoring Verification
		July 22, 2019	Initial Assessment Monitoring
		October 22, 2019	Semi-Annual Assessment Monitoring

3.2 Water Levels and Sample Collection

Water levels were collected in each well prior to sample collection. Groundwater quality samples were collected in all monitoring wells unless wells were dry. Groundwater sample collection protocols follow the Groundwater Sample Collection Standard Operating Procedure (SOP) (HDR, 2016). The water samples were collected using a submersible Geotech SS Geosub pump, and the pump and hose were decontaminated between wells following protocols outlined in the Sampling SOP. Each well was purged until field parameters stabilized in accordance with the sampling SOP. In accordance with the CCR Rule, groundwater samples were not field filtered. The field parameters of turbidity, pH, and temperature were measured using a YSI Professional Plus (or an equivalent) portable water quality instrument that was calibrated prior to use each day of sampling. The results of field measurements were recorded on a field data form, which is maintained as part of the field sampling records. For quality control (QC), one field duplicate sample and one field equipment blank sample was collected during each sample event. Water samples were delivered under Chain of Custody to TestAmerica in Denver, Colorado.

3.3 Analytical Testing

Groundwater samples for each type of monitoring were analyzed for the COIs shown in **Appendix A** and listed in **Table 1**. Background monitoring analyses include all of the parameters in Appendices III and IV of CCR Rule Part 257, plus TSS. Detection monitoring samples are analyzed for all Appendix III COIs. Initial assessment monitoring samples are analyzed for Appendix IV COIs to determine what COIs are detected. The semi-annual assessment monitoring samples are analyzed for Appendix III and detected Appendix IV COIs, plus TSS. Which COIs were detected at each facility is described in Section 4.2. Annual assessment monitoring samples are analyzed for all Appendix III and Appendix IV COIs, plus TSS. The laboratory analyzed matrix spike/matrix spike duplicates at a rate of 5 percent, per laboratory quality control procedures.

3.4 Data Validation and Data Management

Data validation and data management tasks were performed per the Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule (HDR, 2017). Data validation was conducted to eliminate data that did not meet validation criteria, and designate a data qualifier for any data quality limitation discovered.

All samples and quality control (QC) data were reviewed and evaluated, and no samples were rejected. Most QC analyses were within reportable limits; however, when QC was outside limit controls, samples were reported as estimated. Relative percent difference (RPD) failures for field duplicate analyses were below the 20 percent limit criteria. Laboratory Control Sample (LCS)/LCS duplicates and Matrix Spike/Duplicate (MS/MSD) duplicates %RPD recoveries all were within control limits. Data analyses required minimal qualifications, and all data were usable, even when qualified.

4.0 Monitoring Results

4.1 Water Levels and Groundwater Flow Direction

The water levels at monitoring wells were recorded during monitoring events. During and since closure of the ash ponds by removal of all CCR, wells MW-8, MW-9, and MW-7 are often dry. This indicates that the water in the former impoundments was causing some groundwater mounding beneath the ponds and controlling water levels in the monitoring wells surrounding the ponds. The water levels and contour map (**Appendix B**) confirm that monitoring well MW-13 is located upgradient of the ash ponds and is appropriate to represent background water quality. The contour map reflects water level data from 2018 because in 2019 some of the wells remained dry and there were few dates when CTRP and ash impoundments were sampled concurrently. The MW-7 well location on the west side of the West Impoundment is hydraulically upgradient of the impoundments; however, the monitoring performed to date has identified that the ponds may have influenced water quality at well MW-7; therefore the MW-7 well is not representative of background water. Monitoring well MW-13 is located upgradient of the CCR impoundments and serves as the background monitoring well for the West, Center, and East CCR ponds. Groundwater flow under the ash ponds is to the east.

The water levels and contour map (**Appendix B**) confirm that monitoring well MW-14 is located upgradient of the CTRP and is appropriate to represent background water quality for the CTRP. Groundwater flow under the CTRP is to the east. Therefore, the selected downgradient wells are appropriately located to monitor the CCR impoundments.

4.2 Water Quality

4.2.1 West, Center, and East Ash Impoundments

As stipulated in the CCR Rule, eight rounds of background groundwater sampling and detection monitoring were completed before October 17, 2017 for the former West, Center, and East ash impoundments. The background sampling was described in detail in the *Background Water Quality Statistical Certification* (HDR 2020). The first detection monitoring event was conducted on September 12-14, 2017. In the January 15, 2018 PSCo memorandum, *Determination of Statistically Significant Increases over Background per 257.93(h)(2)*, concentrations of Appendix III COIs from downgradient monitoring wells MW-7, MW-9, and MW-10 (MW-8 was dry) were compared against the BTVs and several COIs were shown to have SSIs over BTVs (upper prediction limit). These SSIs triggered the assessment monitoring program for the impoundments.

In accordance with CCR Rule 257.95(h), GPS were established for each detected Appendix IV COI and documented in the October 10, 2018 memorandum *Groundwater Protection Standards and Determination of no SSIs per 257.95(g)*. For each detected COI, **Table 4** lists the EPA established MCL from 40 CFR 141.62 and 141.66, the BTV (upper tolerance level) for the Cherokee ash impoundments, and the GPS.

Table 4. Groundwater Protection Standards for Detected Appendix IV COIs for the Ash Impoundments 257.95(d)(3)

Constituent	Unit	MCL)	Background Value (UTL)	GPS
Antimony	mg/l	0.00600	0.000570	0.00600
Arsenic	mg/l	0.0100	0.00135	0.0100
Barium	mg/l	2.00	0.136	2.00
Cadmium	mg/l	0.00500	0.000310	0.00500
Chromium, Total	mg/l	0.100	0.0118	0.100
Cobalt	mg/l	0.00600	0.000970	0.00600
Fluoride	mg/l	4.00	1.20	4.00
Lead	mg/l	0.0150	0.00130	0.0150
Lithium	mg/l	0.0400	0.159	0.159
Mercury	mg/l	0.00200	0.0000270	0.00200
Molybdenum	mg/l	0.100	0.00473	0.100
Radium-226-228	pci/l	5.0^	1.23	5.0
Selenium	pci/l	0.0500	0.0109	0.0500

*EPA adopted health-based value in place of MCL.
^Colorado Water Quality Regulation

Annual and semiannual assessment monitoring sample collection continued in 2019. Annual assessment monitoring samples were collected and analyzed for all Appendix III and Appendix IV COIs in June 2019. All of the COIs were detected. In December 2019 semiannual assessment monitoring samples were collected and analyzed for Appendix III and detected (all) Appendix IV COIs. In both assessment monitoring events, wells MW-8 and MW-9 were dry. Laboratory reports for 2019 are provided in **Appendix C**. After the June 2019 assessment monitoring event, in accordance with CCR Rule 257.95(e), downgradient well concentrations were compared against background values, and some concentrations were found to be above background values. In accordance with CCR Rule 257.95(f), detected Appendix IV COI concentrations in downgradient wells were compared against GPS and were found not to exceed GPS. Therefore, in accordance with CCR Rule 257.95(f), the CCR unit continues in assessment monitoring. Assessment monitoring data for the December 2019 semiannual assessment monitoring event for the impoundments has not been received as of the end of 2019 for evaluation against BTVs and GPS.

Closure of the former West, Center, and East ash impoundments was completed in December 2018 through removal of CCR per 257.102(e)(i). The CCR material has been completely removed from the former impoundments, and concentrations of CCR constituents are expected to decrease through natural attenuation. All groundwater monitoring at the impoundments occurring after December 2018 reflects new conditions (post-closure) after the CCR waste was removed. In 2020, PSCo will continue to monitor groundwater in accordance with the assessment monitoring program and consistent with 257.93(e) to evaluate whether clean closure criteria in groundwater have been met. PSCo will continue to evaluate assessment monitoring data in accordance with CCR Rule 257.95.

4.2.2 Cooling Tower Retention Pond

Removal of CCR and all areas affected by releases of CCR at the CTRP was completed in March 2017. The CCR material has been completely removed from the pond. Therefore it is important to note that all groundwater monitoring occurring after March 2017 at the CTRP reflect post-CCR removal conditions.

Eight groundwater sampling events of both upgradient and downgradient wells at the CTRP occurred between August 29, 2018 and January 16, 2019 for background water monitoring. All four CTRP monitoring wells (MW-14, MW-15, MW-16, and MW-17) were sampled during the eight events. Groundwater was analyzed for CCR Rule Appendix III and IV COIs plus TSS. Laboratory reports for 2019 events are provided in **Appendix C**.

The first detection monitoring event was conducted on February 11, 2019. Background threshold values were statistically developed. A review of the background data revealed that the last four sampling events that occurred from November 2018 to January 2019 were distinctly different than the first four sampling events for the majority of the constituents that are analyzed. These differences were such that increasing trends over time were detected at statistically significant levels in all wells, including the upgradient well. The differences can likely be attributed to the impact of construction that was performed at the site during the latter sampling period. Therefore, the samples collected from November 2018 to January 2019 are not considered representative of true background conditions and were removed from the statistical analysis for estimating background concentration levels. The background sampling was described in detail in the *Background Water Quality Statistical Certification* (HDR 2020), where the BTVs were developed based on four background events. Concentrations of Appendix III COIs from downgradient monitoring well detection monitoring at the former CTRP were compared against the BTVs and several were shown to have SSIs over BTVs. Therefore detection monitoring verification samples were also collected on April 9, May 7, and June 3, 2019. In the June 13, 2019 PSCo memorandum, *Determination of Statistically Significant Increases over Background per 257.93(h)(2)*, concentrations of Appendix III COIs from downgradient monitoring wells at the former CTRP were compared against the BTVs and several were shown to have SSIs over BTVs.

These SSIs triggered the assessment monitoring program for the former CTRP. As stipulated in CCR Rule 257.95(b), within 90 days of the SSI determination an initial assessment monitoring event must be completed. This was completed in July 22-23, 2019 and consisted of sampling the network of CTRP monitoring wells for Appendix IV constituents. Laboratory reports for 2019 events are provided in **Appendix C**. All Appendix IV constituents were detected in at least one well with the exception of beryllium and mercury.

On October 22, 2019, the first semiannual assessment monitoring samples were collected from all of the former CTRP monitoring wells. Samples were analyzed for Appendix III and detected Appendix IV COIs plus TSS. Samples were collected from the monitoring network of wells (MW-14, MW-15, MW-16, and MW-17). Laboratory reports are provided in **Appendix C**.

In 2020, downgradient well concentrations from the former CTRP October 2019 assessment monitoring event will be compared against background values and against GPS values in accordance with CCR Rule 257.95(e-g). In 2020, PSCo will continue to monitor groundwater in accordance with the assessment monitoring program and consistent with 257.93(e).

5.0 Summary

The following observations are based on CCR Rule compliance monitoring data collected during the 2019 and prior sample events:

West, Center, and East Ash Impoundments

- All CCR waste was removed from the three ash impoundments by December 2018. Groundwater monitoring will continue in 2020 and will evaluate the post-closure groundwater quality.
- The certified well network wells for the impoundments was sampled June 4, 2019 for annual assessment monitoring for Appendix III and IV COIs (MW-8 and MW-9 were dry). Assessment monitoring data from the impoundments was statistically evaluated and no SSLs above the GPS were observed.
- The certified well network wells for the impoundments was sampled December 10-12, 2019 for semiannual assessment monitoring for Appendix III and detected IV COIs (MW-8 and MW-9 were dry). Assessment monitoring data from the impoundments has not been received as of the end of 2019 for evaluation against BTVs and GPS.
- Cherokee Station ash impoundments status at the end of 2019 is assessment monitoring. Assessment monitoring will continue in 2020 while continuing to evaluate whether clean closure criteria in groundwater have been met.

(Closed) Cooling Tower Retention Pond

- All CCR waste was removed from the CTRP by March 30, 2017.
- Detection monitoring was completed in February-June 2019 and data from the former CTRP was statistically evaluated and SSIs over background were detected at wells for several COIs.
- All certified well network wells were sampled in July 2019 for the first assessment monitoring event to determine the detected Appendix IV COIs.
- The certified well network wells were sampled in October 2019 for the first semi-annual assessment monitoring event and the results will be compared against background values and against GPS values in 2020.
- Cherokee Station CTRP status at the end of 2019 is in assessment monitoring; however because the pond has been closed all monitoring reflects post-CCR removal. Assessment monitoring will continue to evaluate whether clean closure criteria in groundwater have been met.

6.0 References

CDH (Colorado Department of Health), 1993. Record of Decision ASARCO Globe Plant Site. Denver, Colorado. February 18, 1993.

GeoTrans, Inc., 2009. Letter to Christine Johnston, Xcel Energy. Groundwater/Surface-Ponds Data Evaluation, Cherokee Station, Denver, Colorado. March 2009.

HDR, 2019. Groundwater Monitoring System Certification - Compliance with the Coal Combustion Residuals Rule Cherokee Station. April 26, 2016.

HDR, 2019. Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule. Updated July 19, 2019.

HDR, 2020. Background Water Quality Statistical Certification. January 31, 2020.

Tetra Tech, 2013. Inventory and Preliminary Classification Report, Waste Impoundments, Cherokee Station, Denver, Colorado. March 29, 2013.

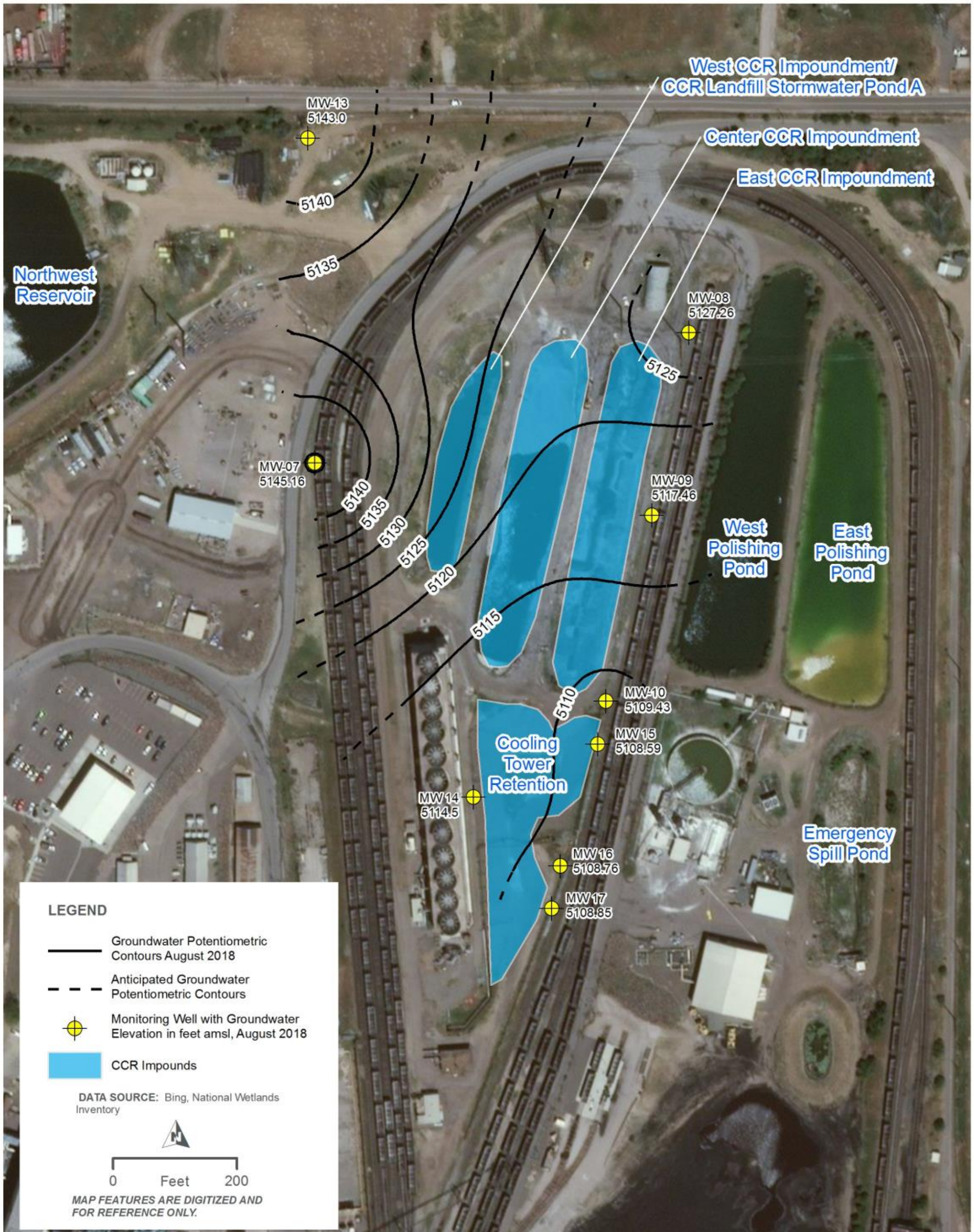
Appendix A

Monitoring types to comply with specific CCR Rule requirements

Monitoring types to comply with specific CCR Rule requirements			
Type of Monitoring	**Description**	**CCR Rule Reference**	**Constituents Analyzed**
Background Monitoring	Development of background water quality conditions for Appendix III and Appendix IV COIs	257.94(b)	Appendix III and IV and TSS
Detection Monitoring	Semi-annual detection monitoring for Appendix III COIs	257.94(c)	Appendix III
Assessment Monitoring	Detailed types below.	257.95	Detailed types below.
➢ Initial Assessment	Determining detected Appendix IV COIs	257.95(b)	Appendix IV
➢ Semi-Annual Assessment	Semi-annual assessment monitoring for Appendix III and detected Appendix IV COIs	257.95(d)	Appendix III and detected Appendix IV plus TSS
➢ Annual Assessment	Determining detected Appendix IV COIs on an annual basis. Starting in 2019 this will also count as the semi-annual sample event.	257.95(b)	Appendix III and all Appendix IV plus TSS
Post-CCR removal Monitoring	Occurs after the facility has been physically closed (e.g. all CCR waste removed from the impoundment). This is an PSCo designation added to other types of monitoring (e.g. Background Monitoring or Detection Monitoring.	N/A	Appendix III and/or Appendix IV as applicable plus TSS
Closure Confirmation Monitoring	Occurs after the facility has been closed (e.g. all CCR waste removed from the impoundment) in compliance with CCR Rule for certification of Clean Closure.	257.102	Appendix IV

Appendix B

Potentiometric Surface Map



Xcel Energy

CHEROKEE POWER STATION

ADAMS COUNTY, CO

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Appendix C

Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-119201-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
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1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
2/15/2019 8:02:16 PM

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

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Client: HDR Inc TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Qualifiers

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
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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)

Job ID: 280-119201-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-119201-1

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

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

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

RECEIPT

The samples were received on 1/16/2019 1:17 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 5.6º C and 5.9º C.

Receipt Exceptions

The requested Radiochemistry analyses were performed by TestAmerica's St. Louis laboratory.

The requested Metals analysis were performed by TestAmerica's Canton laboratory.

TOTAL RECOVERABLE METALS

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 01/21/2019 and analyzed on 01/22/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 01/21/2019 and analyzed on 01/23/2019.

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

TOTAL MERCURY

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 01/21/2019 and analyzed on 01/22/2019.

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

TOTAL DISSOLVED SOLIDS

Job ID: 280-119201-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 01/22/2019.

Total Dissolved Solids (TDS) was detected in method blank MB 280-444977/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

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

TOTAL SUSPENDED SOLIDS

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 01/22/2019.

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

CORROSIVITY (PH)

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 01/17/2019 and 01/18/2019.

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

ANIONS (28 DAYS)

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 01/23/2019.

Samples MW-14 (280-119201-1)[2X], MW-14 (280-119201-1)[50X], MW-15 (280-119201-2)[2X], MW-15 (280-119201-2)[50X], MW-16 (280-119201-3)[20X], MW-17 (280-119201-4)[10X] and MW-17D (280-119201-5)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 01/22/2019 and analyzed on 02/13/2019.

Radium-226 was detected in method blank MB 160-411721/21-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The following sample was prepared at a reduced aliquot due to yellow discoloration: MW-14 (280-119201-1).

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

RADIUM-228

Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 01/22/2019 and analyzed on 02/07/2019.

The following sample was prepared at a reduced aliquot due to yellow discoloration: MW-14 (280-119201-1).

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

Job ID: 280-119201-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-14 (280-119201-1), MW-15 (280-119201-2), MW-16 (280-119201-3), MW-17 (280-119201-4), MW-17D (280-119201-5) and EB (280-119201-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 02/14/2019.

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

Detection Summary

Client: HDR Inc
TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 — Lab Sample ID: 280-119201-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.3		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.0013	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0052		0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.082		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.0053		0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	420		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.012		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0088		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.0053		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.13		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.044		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0043	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	1100		150	13	mg/L	50		9056A	Total/NA
Fluoride	4.2		1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2100		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	4500	B	40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	7.2		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-15 — Lab Sample ID: 280-119201-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.5		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.0015	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0023	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.098		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00096	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	450		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0051		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0022		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.14		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.020		0.010	0.0011	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client: HDR Inc
TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-15 (Continued) — Lab Sample ID: 280-119201-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.0065		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	660		150	13	mg/L	50		9056A	Total/NA
Fluoride	1.4		1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	1500		250	12	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	3000	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16 — Lab Sample ID: 280-119201-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.71		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00084	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0039	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.052		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00028	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	250		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0015	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00046	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.074		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.018		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0071		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	330		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	2.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	700		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	1800	B	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17 — Lab Sample ID: 280-119201-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.91		0.10	0.023	mg/L	1		6010C	Total Recoverable
Arsenic	0.0046	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.029		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00067	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	110		1.0	0.58	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-17 (Continued)

Lab Sample ID: 280-119201-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.00040	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.031		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0074	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0039	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	120		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	340		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	840	B	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17D

Lab Sample ID: 280-119201-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.87		0.10	0.023	mg/L	1		6010C	Total Recoverable
Arsenic	0.0043	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.026		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00064	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	96		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.00038	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.028		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0066	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0035	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	120		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	350		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	810	B	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB

Lab Sample ID: 280-119201-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	0.0086		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00029	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0016	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: EB (Continued)

Lab Sample ID: 280-119201-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	0.29	J	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	0.45	J	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	18	B	10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-119201-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-119201-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-119201-1	MW-14	Water	01/16/19 10:00	01/16/19 13:17
280-119201-2	MW-15	Water	01/15/19 12:38	01/16/19 13:17
280-119201-3	MW-16	Water	01/15/19 14:00	01/16/19 13:17
280-119201-4	MW-17	Water	01/15/19 14:55	01/16/19 13:17
280-119201-5	MW-17D	Water	01/15/19 14:55	01/16/19 13:17
280-119201-6	EB	Water	01/16/19 11:38	01/16/19 13:17

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-14
Lab Sample ID: 280-119201-1
Date Collected: 01/16/19 10:00
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.3**		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:11	1

Client Sample ID: MW-15
Lab Sample ID: 280-119201-2
Date Collected: 01/15/19 12:38
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.5**		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:16	1

Client Sample ID: MW-16
Lab Sample ID: 280-119201-3
Date Collected: 01/15/19 14:00
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.71**		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:20	1

Client Sample ID: MW-17
Lab Sample ID: 280-119201-4
Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.91**		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:25	1

Client Sample ID: MW-17D
Lab Sample ID: 280-119201-5
Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.87**		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:38	1

Client Sample ID: EB
Lab Sample ID: 280-119201-6
Date Collected: 01/16/19 11:38
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 16:42	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-14
Lab Sample ID: 280-119201-1
Date Collected: 01/16/19 10:00
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0013**	**J**	0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:40	1
Arsenic	**0.0052**		0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:40	1
Barium	**0.082**		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:40	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:40	1
Cadmium	**0.0053**		0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:40	1
Calcium	**420**		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:40	1
Chromium	**0.012**		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:40	1
Cobalt	**0.0088**		0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:40	1
Lead	**0.0053**		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:40	1
Lithium	**0.13**		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:40	1
Molybdenum	**0.044**		0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:40	1
Selenium	**0.0043**	**J**	0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:40	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:40	1

Client Sample ID: MW-15
Lab Sample ID: 280-119201-2
Date Collected: 01/15/19 12:38
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:42	1
Arsenic	0.0023	J	0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:42	1
Barium	0.098		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:42	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:42	1
Cadmium	0.00096	J	0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:42	1
Calcium	450		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:42	1
Chromium	0.0051		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:42	1
Cobalt	0.0022		0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:42	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:42	1
Lithium	0.14		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:42	1
Molybdenum	0.020		0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:42	1
Selenium	0.0065		0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:42	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:42	1

Client Sample ID: MW-16
Lab Sample ID: 280-119201-3
Date Collected: 01/15/19 14:00
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00084	J	0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:44	1
Arsenic	0.0039	J	0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:44	1
Barium	0.052		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:44	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:44	1
Cadmium	0.00028	J	0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:44	1
Calcium	250		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:44	1
Chromium	0.0015	J	0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:44	1
Cobalt	0.00046	J	0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:44	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:44	1
Lithium	0.074		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:44	1
Molybdenum	0.018		0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:44	1
Selenium	0.0071		0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:44	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:44	1

Client Sample ID: MW-17
Lab Sample ID: 280-119201-4
Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:47	1
Arsenic	0.0046	J	0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:47	1
Barium	0.029		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:47	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:47	1
Cadmium	0.00067	J	0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:47	1
Calcium	110		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:47	1
Chromium	ND		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:47	1
Cobalt	0.00040	J	0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:47	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:47	1
Lithium	0.031		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:47	1
Molybdenum	0.0074	J	0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:47	1
Selenium	0.0039	J	0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:47	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:47	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee
TestAmerica Job ID: 280-119201-1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-17D
Date Collected: 01/15/19 14:55
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:49	1
Arsenic	**0.0043**	**J**	0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:49	1
Barium	**0.026**		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:49	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:49	1
Cadmium	**0.00064**	**J**	0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:49	1
Calcium	**96**		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:49	1
Chromium	ND		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:49	1
Cobalt	**0.00038**	**J**	0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:49	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:49	1
Lithium	**0.028**		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:49	1
Molybdenum	**0.0066**	**J**	0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:49	1
Selenium	**0.0035**	**J**	0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:49	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:49	1

Client Sample ID: EB
Date Collected: 01/16/19 11:38
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:51	1
Arsenic	ND		0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:51	1
Barium	ND		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:51	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:51	1
Cadmium	ND		0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:51	1
Calcium	ND		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:51	1
Chromium	**0.0086**		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:51	1
Cobalt	**0.00029**	**J**	0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:51	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:51	1
Lithium	ND		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:51	1
Molybdenum	**0.0016**	**J**	0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:51	1
Selenium	ND		0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:51	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:51	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 01/16/19 10:00
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:16	1

Client Sample ID: MW-15
Date Collected: 01/15/19 12:38
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:18	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-16 **Lab Sample ID: 280-119201-3**
Date Collected: 01/15/19 14:00 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:20	1

Client Sample ID: MW-17 **Lab Sample ID: 280-119201-4**
Date Collected: 01/15/19 14:55 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:22	1

Client Sample ID: MW-17D **Lab Sample ID: 280-119201-5**
Date Collected: 01/15/19 14:55 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:24	1

Client Sample ID: EB **Lab Sample ID: 280-119201-6**
Date Collected: 01/16/19 11:38 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 12:26	1

General Chemistry

Client Sample ID: MW-14 **Lab Sample ID: 280-119201-1**
Date Collected: 01/16/19 10:00 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.3**	**HF**	0.1	0.1	SU			01/18/19 12:55	1
Temperature	**21.6**	**HF**	1.0	1.0	Degrees C			01/18/19 12:55	1
Chloride	**1100**		150	13	mg/L			01/23/19 00:30	50
Fluoride	**4.2**		1.0	0.12	mg/L			01/23/19 00:15	2
Sulfate	**2100**		250	12	mg/L			01/23/19 00:30	50
Total Dissolved Solids (TDS)	**4500**	**B**	40	19	mg/L			01/22/19 09:30	1
Total Suspended Solids	**7.2**		4.0	1.1	mg/L			01/22/19 13:16	1

Client Sample ID: MW-15 **Lab Sample ID: 280-119201-2**
Date Collected: 01/15/19 12:38 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.9**	**HF**	0.1	0.1	SU			01/17/19 15:58	1
Temperature	**21.2**	**HF**	1.0	1.0	Degrees C			01/17/19 15:58	1
Chloride	**660**		150	13	mg/L			01/23/19 01:01	50
Fluoride	**1.4**		1.0	0.12	mg/L			01/23/19 00:46	2
Sulfate	**1500**		250	12	mg/L			01/23/19 01:01	50
Total Dissolved Solids (TDS)	**3000**	**B**	40	19	mg/L			01/22/19 09:30	1
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Client Sample ID: MW-16 **Lab Sample ID: 280-119201-3**
Date Collected: 01/15/19 14:00 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.4**	**HF**	0.1	0.1	SU			01/17/19 15:55	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

General Chemistry (Continued)

Client Sample ID: MW-16
Lab Sample ID: 280-119201-3
Date Collected: 01/15/19 14:00
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	21.8	HF	1.0	1.0	Degrees C			01/17/19 15:55	1
Chloride	330		60	5.1	mg/L			01/23/19 01:32	20
Fluoride	2.5		0.50	0.060	mg/L			01/23/19 01:17	1
Sulfate	700		100	4.6	mg/L			01/23/19 01:32	20
Total Dissolved Solids (TDS)	1800	B	20	9.4	mg/L			01/22/19 09:30	1
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Client Sample ID: MW-17
Lab Sample ID: 280-119201-4
Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.2	HF	0.1	0.1	SU			01/17/19 15:49	1
Temperature	21.5	HF	1.0	1.0	Degrees C			01/17/19 15:49	1
Chloride	120		3.0	0.25	mg/L			01/23/19 02:18	1
Fluoride	1.5		0.50	0.060	mg/L			01/23/19 02:18	1
Sulfate	340		50	2.3	mg/L			01/23/19 02:34	10
Total Dissolved Solids (TDS)	840	B	20	9.4	mg/L			01/22/19 09:30	1
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Client Sample ID: MW-17D
Lab Sample ID: 280-119201-5
Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.2	HF	0.1	0.1	SU			01/17/19 16:13	1
Temperature	21.4	HF	1.0	1.0	Degrees C			01/17/19 16:13	1
Chloride	120		3.0	0.25	mg/L			01/23/19 02:49	1
Fluoride	1.5		0.50	0.060	mg/L			01/23/19 02:49	1
Sulfate	350		50	2.3	mg/L			01/23/19 03:05	10
Total Dissolved Solids (TDS)	810	B	20	9.4	mg/L			01/22/19 09:30	1
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Client Sample ID: EB
Lab Sample ID: 280-119201-6
Date Collected: 01/16/19 11:38
Matrix: Water
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.6	HF	0.1	0.1	SU			01/17/19 16:08	1
Temperature	20.7	HF	1.0	1.0	Degrees C			01/17/19 16:08	1
Chloride	0.29	J	3.0	0.25	mg/L			01/23/19 03:20	1
Fluoride	ND		0.50	0.060	mg/L			01/23/19 03:20	1
Sulfate	0.45	J	5.0	0.23	mg/L			01/23/19 03:20	1
Total Dissolved Solids (TDS)	18	B	10	4.7	mg/L			01/22/19 09:30	1
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14 **Lab Sample ID: 280-119201-1**
Date Collected: 01/16/19 10:00 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.284		0.143	0.145	1.00	0.169	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Client Sample ID: MW-15 **Lab Sample ID: 280-119201-2**
Date Collected: 01/15/19 12:38 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.213		0.109	0.111	1.00	0.134	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Client Sample ID: MW-16 **Lab Sample ID: 280-119201-3**
Date Collected: 01/15/19 14:00 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.210		0.102	0.104	1.00	0.114	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Client Sample ID: MW-17 **Lab Sample ID: 280-119201-4**
Date Collected: 01/15/19 14:55 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.145		0.0839	0.0849	1.00	0.100	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Client Sample ID: MW-17D **Lab Sample ID: 280-119201-5**
Date Collected: 01/15/19 14:55 **Matrix: Water**
Date Received: 01/16/19 13:17

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.176		0.0955	0.0968	1.00	0.118	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: EB
Date Collected: 01/16/19 11:38
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0853	U	0.0736	0.0740	1.00	0.109	pCi/L	01/22/19 14:43	02/13/19 07:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:48*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 01/16/19 10:00
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.22**		0.408	0.423	1.00	0.551	pCi/L	01/22/19 15:18	02/07/19 09:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:58*	*1*
Y Carrier	*79.3*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:58*	*1*

Client Sample ID: MW-15
Date Collected: 01/15/19 12:38
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.55**		0.330	0.359	1.00	0.363	pCi/L	01/22/19 15:18	02/07/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.6*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*
Y Carrier	*80.4*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*

Client Sample ID: MW-16
Date Collected: 01/15/19 14:00
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.831**		0.277	0.288	1.00	0.359	pCi/L	01/22/19 15:18	02/07/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*
Y Carrier	*75.9*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-17
Date Collected: 01/15/19 14:55
Date Received: 01/16/19 13:17

Lab Sample ID: 280-119201-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.763		0.264	0.273	1.00	0.339	pCi/L	01/22/19 15:18	02/07/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*
Y Carrier	*76.6*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*

Client Sample ID: MW-17D
Date Collected: 01/15/19 14:55
Date Received: 01/16/19 13:17

Lab Sample ID: 280-119201-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.682		0.294	0.301	1.00	0.419	pCi/L	01/22/19 15:18	02/07/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.2*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*
Y Carrier	*74.4*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*

Client Sample ID: EB
Date Collected: 01/16/19 11:38
Date Received: 01/16/19 13:17

Lab Sample ID: 280-119201-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.927		0.296	0.308	1.00	0.394	pCi/L	01/22/19 15:18	02/07/19 09:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*
Y Carrier	*76.6*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:59*	*1*

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

Client Sample ID: MW-14
Date Collected: 01/16/19 10:00
Date Received: 01/16/19 13:17

Lab Sample ID: 280-119201-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.51		0.432	0.447	5.00	0.551	pCi/L		02/14/19 14:01	1

Client Sample ID: MW-15
Date Collected: 01/15/19 12:38
Date Received: 01/16/19 13:17

Lab Sample ID: 280-119201-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.76		0.348	0.376	5.00	0.363	pCi/L		02/14/19 14:01	1

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

Client Sample ID: MW-16
Date Collected: 01/15/19 14:00
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.04		0.295	0.306	5.00	0.359	pCi/L		02/14/19 14:01	1

Client Sample ID: MW-17
Date Collected: 01/15/19 14:55
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.908		0.277	0.286	5.00	0.339	pCi/L		02/14/19 14:01	1

Client Sample ID: MW-17D
Date Collected: 01/15/19 14:55
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.859		0.309	0.316	5.00	0.419	pCi/L		02/14/19 14:01	1

Client Sample ID: EB
Date Collected: 01/16/19 11:38
Date Received: 01/16/19 13:17
Lab Sample ID: 280-119201-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.01		0.305	0.317	5.00	0.394	pCi/L		02/14/19 14:01	1

Client: HDR Inc
TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-364770/1-A
Matrix: Water
Analysis Batch: 365121

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 364770

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		01/21/19 14:00	01/22/19 15:02	1

Lab Sample ID: LCS 240-364770/2-A
Matrix: Water
Analysis Batch: 365121

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 364770

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.970		mg/L		97	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-364770/1-A
Matrix: Water
Analysis Batch: 365197

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 364770

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		01/21/19 14:00	01/23/19 10:33	1
Arsenic	ND		0.0050	0.00075	mg/L		01/21/19 14:00	01/23/19 10:33	1
Barium	ND		0.0050	0.0022	mg/L		01/21/19 14:00	01/23/19 10:33	1
Beryllium	ND		0.0010	0.00031	mg/L		01/21/19 14:00	01/23/19 10:33	1
Cadmium	ND		0.0010	0.00021	mg/L		01/21/19 14:00	01/23/19 10:33	1
Calcium	ND		1.0	0.58	mg/L		01/21/19 14:00	01/23/19 10:33	1
Chromium	ND		0.0020	0.00098	mg/L		01/21/19 14:00	01/23/19 10:33	1
Cobalt	ND		0.0010	0.00019	mg/L		01/21/19 14:00	01/23/19 10:33	1
Lead	ND		0.0010	0.00045	mg/L		01/21/19 14:00	01/23/19 10:33	1
Lithium	ND		0.0080	0.0017	mg/L		01/21/19 14:00	01/23/19 10:33	1
Molybdenum	ND		0.010	0.0011	mg/L		01/21/19 14:00	01/23/19 10:33	1
Selenium	ND		0.0050	0.00089	mg/L		01/21/19 14:00	01/23/19 10:33	1
Thallium	ND		0.0010	0.00020	mg/L		01/21/19 14:00	01/23/19 10:33	1

Lab Sample ID: LCS 240-364770/3-A
Matrix: Water
Analysis Batch: 365197

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 364770

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.104		mg/L		104	80 - 120
Arsenic	1.00	1.07		mg/L		107	80 - 120
Barium	1.00	1.11		mg/L		111	80 - 120
Beryllium	1.00	0.985		mg/L		99	80 - 120
Cadmium	1.00	1.11		mg/L		111	80 - 120
Calcium	10.0	11.0		mg/L		110	80 - 120
Chromium	1.00	1.09		mg/L		109	80 - 120
Cobalt	1.00	1.09		mg/L		109	80 - 120
Lead	1.00	1.14		mg/L		114	80 - 120
Lithium	0.100	0.0928		mg/L		93	80 - 120
Molybdenum	0.100	0.107		mg/L		107	80 - 120
Selenium	1.00	1.06		mg/L		106	80 - 120
Thallium	0.250	0.285		mg/L		114	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-364782/1-A | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 365155 | **Prep Batch: 364782**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		01/21/19 12:00	01/22/19 11:41	1

Lab Sample ID: LCS 240-364782/2-A | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 365155 | **Prep Batch: 364782**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.13		ug/L		103	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-444692/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 444692

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCS 280-444870/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 444870

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCSD 280-444870/5 | **Client Sample ID: Lab Control Sample Dup**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 444870

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101	0	5

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-444983/6 | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 444983

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			01/22/19 11:44	1
Fluoride	ND		0.50	0.060	mg/L			01/22/19 11:44	1
Sulfate	ND		5.0	0.23	mg/L			01/22/19 11:44	1

Lab Sample ID: LCS 280-444983/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 444983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.3		mg/L		99	90 - 110

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

Lab Sample ID: LCS 280-444983/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444983

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	5.00	5.00		mg/L		100	90 - 110
Sulfate	100	98.5		mg/L		98	90 - 110

Lab Sample ID: LCSD 280-444983/5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444983

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.5		mg/L		99	90 - 110	0	10
Fluoride	5.00	5.00		mg/L		100	90 - 110	0	10
Sulfate	100	98.3		mg/L		98	90 - 110	0	10

Lab Sample ID: MRL 280-444983/3 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444983

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.40	J	mg/L		96	50 - 150
Fluoride	0.200	0.185	J	mg/L		92	50 - 150
Sulfate	2.50	2.35	J	mg/L		94	50 - 150

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

Lab Sample ID: MB 280-444977/1 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444977

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	6.00	J	10	4.7	mg/L			01/22/19 09:30	1

Lab Sample ID: LCS 280-444977/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444977

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	483		mg/L		97	93 - 110

Lab Sample ID: LCSD 280-444977/3 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 444977

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	500	496		mg/L		99	93 - 110	3	20

QC Sample Results

Client: HDR Inc	TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-445011/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 445011

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			01/22/19 13:16	1

Lab Sample ID: LCS 280-445011/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 445011

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	107		mg/L		107	79 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-411721/21-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 414837 — **Prep Batch: 411721**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1736		0.0817	0.0832	1.00	0.0837	pCi/L	01/22/19 14:43	02/13/19 07:51	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*01/22/19 14:43*	*02/13/19 07:51*	*1*

Lab Sample ID: LCS 160-411721/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 414836 — **Prep Batch: 411721**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	12.07		1.27	1.00	0.127	pCi/L	106	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.8*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-411759/21-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 413950 — **Prep Batch: 411759**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3034	U	0.253	0.255	1.00	0.403	pCi/L	01/22/19 15:18	02/07/19 09:55	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:55*	*1*
Y Carrier	*75.9*		*40 - 110*	*01/22/19 15:18*	*02/07/19 09:55*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-411759/1-A
Matrix: Water
Analysis Batch: 414003

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 411759

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.51	11.56		1.31	1.00	0.393	pCi/L	122	56 - 140

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*96.8*		*40 - 110*
Y Carrier	*74.8*		*40 - 110*

Metals

Prep Batch: 364770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total Recoverable	Water	3005A	
280-119201-2	MW-15	Total Recoverable	Water	3005A	
280-119201-3	MW-16	Total Recoverable	Water	3005A	
280-119201-4	MW-17	Total Recoverable	Water	3005A	
280-119201-5	MW-17D	Total Recoverable	Water	3005A	
280-119201-6	EB	Total Recoverable	Water	3005A	
MB 240-364770/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-364770/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-364770/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 364782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	7470A	
280-119201-2	MW-15	Total/NA	Water	7470A	
280-119201-3	MW-16	Total/NA	Water	7470A	
280-119201-4	MW-17	Total/NA	Water	7470A	
280-119201-5	MW-17D	Total/NA	Water	7470A	
280-119201-6	EB	Total/NA	Water	7470A	
MB 240-364782/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-364782/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 365121

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total Recoverable	Water	6010C	364770
280-119201-2	MW-15	Total Recoverable	Water	6010C	364770
280-119201-3	MW-16	Total Recoverable	Water	6010C	364770
280-119201-4	MW-17	Total Recoverable	Water	6010C	364770
280-119201-5	MW-17D	Total Recoverable	Water	6010C	364770
280-119201-6	EB	Total Recoverable	Water	6010C	364770
MB 240-364770/1-A	Method Blank	Total Recoverable	Water	6010C	364770
LCS 240-364770/2-A	Lab Control Sample	Total Recoverable	Water	6010C	364770

Analysis Batch: 365155

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	7470A	364782
280-119201-2	MW-15	Total/NA	Water	7470A	364782
280-119201-3	MW-16	Total/NA	Water	7470A	364782
280-119201-4	MW-17	Total/NA	Water	7470A	364782
280-119201-5	MW-17D	Total/NA	Water	7470A	364782
280-119201-6	EB	Total/NA	Water	7470A	364782
MB 240-364782/1-A	Method Blank	Total/NA	Water	7470A	364782
LCS 240-364782/2-A	Lab Control Sample	Total/NA	Water	7470A	364782

Analysis Batch: 365197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total Recoverable	Water	6020A	364770
280-119201-2	MW-15	Total Recoverable	Water	6020A	364770
280-119201-3	MW-16	Total Recoverable	Water	6020A	364770
280-119201-4	MW-17	Total Recoverable	Water	6020A	364770
280-119201-5	MW-17D	Total Recoverable	Water	6020A	364770
280-119201-6	EB	Total Recoverable	Water	6020A	364770

Metals (Continued)

Analysis Batch: 365197 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-364770/1-A	Method Blank	Total Recoverable	Water	6020A	364770
LCS 240-364770/3-A	Lab Control Sample	Total Recoverable	Water	6020A	364770

General Chemistry

Analysis Batch: 444692

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-2	MW-15	Total/NA	Water	9040B	
280-119201-3	MW-16	Total/NA	Water	9040B	
280-119201-4	MW-17	Total/NA	Water	9040B	
280-119201-5	MW-17D	Total/NA	Water	9040B	
280-119201-6	EB	Total/NA	Water	9040B	
LCS 280-444692/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 444870

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	9040B	
LCS 280-444870/4	Lab Control Sample	Total/NA	Water	9040B	
LCSD 280-444870/5	Lab Control Sample Dup	Total/NA	Water	9040B	

Analysis Batch: 444977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	SM 2540C	
280-119201-2	MW-15	Total/NA	Water	SM 2540C	
280-119201-3	MW-16	Total/NA	Water	SM 2540C	
280-119201-4	MW-17	Total/NA	Water	SM 2540C	
280-119201-5	MW-17D	Total/NA	Water	SM 2540C	
280-119201-6	EB	Total/NA	Water	SM 2540C	
MB 280-444977/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-444977/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-444977/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 444983

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	9056A	
280-119201-1	MW-14	Total/NA	Water	9056A	
280-119201-2	MW-15	Total/NA	Water	9056A	
280-119201-2	MW-15	Total/NA	Water	9056A	
280-119201-3	MW-16	Total/NA	Water	9056A	
280-119201-3	MW-16	Total/NA	Water	9056A	
280-119201-4	MW-17	Total/NA	Water	9056A	
280-119201-4	MW-17	Total/NA	Water	9056A	
280-119201-5	MW-17D	Total/NA	Water	9056A	
280-119201-5	MW-17D	Total/NA	Water	9056A	
280-119201-6	EB	Total/NA	Water	9056A	
MB 280-444983/6	Method Blank	Total/NA	Water	9056A	
LCS 280-444983/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-444983/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-444983/3	Lab Control Sample	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 445011

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	SM 2540D	
280-119201-2	MW-15	Total/NA	Water	SM 2540D	
280-119201-3	MW-16	Total/NA	Water	SM 2540D	
280-119201-4	MW-17	Total/NA	Water	SM 2540D	
280-119201-5	MW-17D	Total/NA	Water	SM 2540D	
280-119201-6	EB	Total/NA	Water	SM 2540D	
MB 280-445011/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-445011/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Rad

Prep Batch: 411721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	PrecSep-21	
280-119201-2	MW-15	Total/NA	Water	PrecSep-21	
280-119201-3	MW-16	Total/NA	Water	PrecSep-21	
280-119201-4	MW-17	Total/NA	Water	PrecSep-21	
280-119201-5	MW-17D	Total/NA	Water	PrecSep-21	
280-119201-6	EB	Total/NA	Water	PrecSep-21	
MB 160-411721/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-411721/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 411759

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-119201-1	MW-14	Total/NA	Water	PrecSep_0	
280-119201-2	MW-15	Total/NA	Water	PrecSep_0	
280-119201-3	MW-16	Total/NA	Water	PrecSep_0	
280-119201-4	MW-17	Total/NA	Water	PrecSep_0	
280-119201-5	MW-17D	Total/NA	Water	PrecSep_0	
280-119201-6	EB	Total/NA	Water	PrecSep_0	
MB 160-411759/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-411759/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Client Sample ID: MW-14 Lab Sample ID: 280-119201-1
Date Collected: 01/16/19 10:00 Matrix: Water
Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:11	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:40	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:16	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444870	01/18/19 12:55	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	444983	01/23/19 00:15	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	444983	01/23/19 00:30	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			749.27 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.27 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:58	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Client Sample ID: MW-15 Lab Sample ID: 280-119201-2
Date Collected: 01/15/19 12:38 Matrix: Water
Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:16	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:42	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:18	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444692	01/17/19 15:58	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	444983	01/23/19 00:46	TLP	TAL DEN
Total/NA	Analysis	9056A		50	5 mL	5 mL	444983	01/23/19 01:01	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			999.53 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			999.53 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Client Sample ID: MW-16
Lab Sample ID: 280-119201-3

Date Collected: 01/15/19 14:00
Matrix: Water
Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:20	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:44	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:20	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444692	01/17/19 15:55	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	444983	01/23/19 01:17	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	444983	01/23/19 01:32	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			1000.93 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.93 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Client Sample ID: MW-17
Lab Sample ID: 280-119201-4

Date Collected: 01/15/19 14:55
Matrix: Water
Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:25	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:47	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:22	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444692	01/17/19 15:49	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	444983	01/23/19 02:18	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	444983	01/23/19 02:34	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			1000.05 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.05 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Client Sample ID: MW-17D — Lab Sample ID: 280-119201-5

Date Collected: 01/15/19 14:55 — Matrix: Water

Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:38	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:49	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:24	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444692	01/17/19 16:13	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	444983	01/23/19 02:49	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	444983	01/23/19 03:05	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			999.98 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			999.98 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Client Sample ID: EB — Lab Sample ID: 280-119201-6

Date Collected: 01/16/19 11:38 — Matrix: Water

Date Received: 01/16/19 13:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			365121	01/22/19 16:42	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	364770	01/21/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			365197	01/23/19 10:51	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	364782	01/21/19 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			365155	01/22/19 12:26	AJC	TAL CAN
Total/NA	Analysis	9040B		1			444692	01/17/19 16:08	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	444983	01/23/19 03:20	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	444977	01/22/19 09:30	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	445011	01/22/19 13:16	LMD	TAL DEN
Total/NA	Prep	PrecSep-21			1000.71 mL	1.0 g	411721	01/22/19 14:43	CLP	TAL SL
Total/NA	Analysis	9315		1			414836	02/13/19 07:48	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.71 mL	1.0 g	411759	01/22/19 15:18	CLP	TAL SL
Total/NA	Analysis	9320		1			414003	02/07/19 09:59	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			415062	02/14/19 14:01	CDR	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Accreditation/Certification Summary

Client: HDR Inc
TestAmerica Job ID: 280-119201-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19
Kentucky (UST)	State Program	4	58	02-23-19 *
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19 *
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD / DOE		L2305	04-06-19 *
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19 *
Florida	NELAP	4	E87689	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	90125	12-31-18 *
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19

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

Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19 *
North Dakota	State Program	8	R207	06-30-19
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19 *
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-12	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

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

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
(303) 736-0100

Denver #280

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

Client Contact	Project Manager: Matt Rohr	Site Contact: Kaitlin Fishburn	Date:	COC No:
HDR Inc	Tel/Fax: 303-764-537	Lab Contact:	Carrier:	____ of ____ COCs
1670 Broadway, Suite 3400	Analysis Turnaround Time			Sampler:
Denver, CO 80202	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
(907) 644-2078 Phone	TAT if different from Below ____			Walk-in Client:
Matt.Rohr@hdrinc.com Email	☐ 2 weeks			Lab Sampling:
Project Name: Xcel Energy GW CCR	☐ 1 week			
Site: CHEROKEE	☐ 2 days			Job / SDG No.:
P O #	☐ 1 day			

App IV Metals: Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Hg, Mo, Se, Tl, F

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	Total Dissolved Solids	Total Suspendid Solids	pH, Fluoride, Chloride, Sulfate	Ra226/Ra228 combined	App III - Total Metals: Calcium, Boron	App IV Total Metals (see list)
MW-14	1/16/19	1000	G	W	6	N	N	X	X	X	X	X	X
MW-15	1/15/19	1238	G	W	6	N	Y	X	X	X	X	X	X
MW-16	1/15/19	1400	G	W	6	N	N	X	X	X	X	X	X
MW-17	1/15/19	1455	G	W	6	N	N	X	X	X	X	X	X
MW-17D ~~DUP~~ AM	1/15/19	1455	G	W	6	N	N	X	X	X	X	X	X
EB	1/16/19	1138	G	W	6	N	N	X	X	X	X	X	X

280-119201 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:
4.9, 4.6, +1.0, IR5, xfer by RPP 1-16-19

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:		Cooler Temp. (°C): Obs'd: 4.9, 4.6 Corr'd: 5.9, 5.6		Therm ID No.: IR5
Relinquished by: [signature]	Company: HDR	Date/Time: 1-16-19 1317	Received by: [signature]	Company: TA DEN	Date/Time: 1-16-19 1317
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. 4.15, dated 9/27/2017

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-469433.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-119201-1
Address: 13715 Rider Trail North,	**Due Date Requested:** 2/12/2019			
City: Earth City	**TAT Requested (days):**			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14 (280-119201-1)	1/16/19	10:00 Mountain		Water			X	X	X	2	
MW-15 (280-119201-2)	1/15/19	12:38 Mountain		Water			X	X	X	2	
MW-16 (280-119201-3)	1/15/19	14:00 Mountain		Water			X	X	X	2	
MW-17 (280-119201-4)	1/15/19	14:55 Mountain		Water			X	X	X	2	
MW-17D (280-119201-5)	1/15/19	14:55 Mountain		Water			X	X	X	2	
EB (280-119201-6)	1/16/19	11:38 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification

Unconfirmed

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

☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:	
Relinquished by: Christina Baca	Date/Time: 1-18-19 1235	Company: TA Den	Received by: Michael Hum		Date/Time: 1-19-19 0840	Company: TA STL
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company

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

Ver: 09/20/2016

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4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

33 | C3.3

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-469436.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-119201-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 2/8/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

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

535

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	7470A/7470A_Prep Mercury	6020A/3005A 13 T. Metals (w/collision cell), Appill	6010C/3005A Boron	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14 (280-119201-1)	1/16/19	10:00 Mountain		Water			X	X	X	1	, Use Collision Cell
MW-15 (280-119201-2)	1/15/19	12:38 Mountain		Water			X	X	X	1	, Use Collision Cell
MW-16 (280-119201-3)	1/15/19	14:00 Mountain		Water			X	X	X	1	, Use Collision Cell
MW-17 (280-119201-4)	1/15/19	14:55 Mountain		Water			X	X	X	1	, Use Collision Cell
MW-17D (280-119201-5)	1/15/19	14:55 Mountain		Water			X	X	X	1	, Use Collision Cell
EB (280-119201-6)	1/16/19	11:38 Mountain		Water			X	X	X	1	, Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 4 | Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:	
Relinquished by: Christina Baca	Date/Time: 1-18-19 1245	Company TA Den	Received by: [signature]		Date/Time: 1/19/19 945	Company
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:		Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:			

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : ______________

Client TA Denver Site Name ______________ Cooler unpacked by: BS

Cooler Received on 1/19/19 Opened on 1/19/19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ______________

Receipt After-hours: Drop-off Date/Time Storage Location ______________

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ______________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.2** °C) Observed Cooler Temp.______°C Corrected Cooler Temp.______°C
   IR GUN #36 (CF **+0**°C) Observed Cooler Temp. 3.3 °C Corrected Cooler Temp. 3.3 °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC854592**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____________ Yes No
16. Was a LL Hg or Me Hg trip blank present? ______________ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ______________________________

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

Sample(s) ______________ were received after the recommended holding time had expired.
Sample(s) ______________ were received in a broken container.
Sample(s) ______________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______________ were further preserved in the laboratory.
Time preserved: ____________ Preservative(s) added/Lot number(s): ______________.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-119201-1

Login Number: 119201 | **List Source: TestAmerica Denver**
List Number: 1
Creator: Quint, Jessica A

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?	False	
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.	N/A	
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-119201-1

Login Number: 119201
List Number: 3
Creator: Hellm, Michael

List Source: TestAmerica St. Louis
List Creation: 01/19/19 12:55 PM

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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.1
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	

Method: 9315 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-119201-1	MW-14	97.6
280-119201-2	MW-15	97.6
280-119201-3	MW-16	98.2
280-119201-4	MW-17	100
280-119201-5	MW-17D	98.2
280-119201-6	EB	106
LCS 160-411721/1-A	Lab Control Sample	96.8
MB 160-411721/21-A	Method Blank	100

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-119201-1	MW-14	97.6	79.3
280-119201-2	MW-15	97.6	80.4
280-119201-3	MW-16	98.2	75.9
280-119201-4	MW-17	100	76.6
280-119201-5	MW-17D	98.2	74.4
280-119201-6	EB	106	76.6
LCS 160-411759/1-A	Lab Control Sample	96.8	74.8
MB 160-411759/21-A	Method Blank	100	75.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-120138-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
3/18/2019 7:52:26 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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.

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Client: HDR Inc
TestAmerica Job ID: 280-120138-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Qualifiers

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.
F1	MS and/or MSD Recovery is outside acceptance limits.

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.

Rad

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

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)

Job ID: 280-120138-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-120138-1

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

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

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

RECEIPT

The samples were received on 2/13/2019 12:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.9º C and 2.8º C.

Receipt Exceptions

The requested 6010C/6020A/7470A Total Metals analyses were performed by TestAmerica's Canton laboratory.

The requested Radiochemistry analyses were performed by TestAmerica's St. Louis laboratory.

TOTAL RECOVERABLE METALS

Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/18/2019 and analyzed on 02/19/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 02/18/2019 and analyzed on 02/19/2019.

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

TOTAL MERCURY

Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 02/18/2019 and analyzed on 02/20/2019.

Mercury failed the recovery criteria high for the MS/MSD of sample MW-13 (280-120138-2) in batch 240-368756. Refer to the QC report for details. The acceptable LCS data indicate that the analytical system was operating within control.

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

ANIONS (28 DAYS)

Job ID: 280-120138-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 02/20/2019.

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

RADIUM-226 (GFPC)
Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 02/21/2019 and analyzed on 03/15/2019.

Sample MW-13 (280-120138-2) aliquot was reduced due to possible matrix interference. Heavy sediment levels are causing the sample to be opaque and brown in color.

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-10 (280-120138-1) and MW-13 (280-120138-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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-10 (280-120138-1), MW-13 (280-120138-2), (LCS 160-416088/1-A), (LCSD 160-416088/2-A) and (MB 160-416088/22-A)

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

RADIUM-228
Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 02/21/2019 and analyzed on 03/07/2019.

Sample MW-13 (280-120138-2) aliquot was reduced due to possible matrix interference. Heavy sediment levels are causing the sample to be opaque and brown in color.

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-10 (280-120138-1) and MW-13 (280-120138-2). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

The following sample did not meet the requested limit (RL) due to the reduced sample volume attributed to the presence of matrix interferences (see prep NCM 160-160635): MW-13 (280-120138-2). The data have been reported with this narrative.

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. MW-10 (280-120138-1), MW-13 (280-120138-2), (LCS 160-416092/1-A), (LCSD 160-416092/2-A) and (MB 160-416092/22-A)

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. MW-10 (280-120138-1), MW-13 (280-120138-2), (LCS 160-416088/1-A), (LCSD 160-416088/2-A) and (MB 160-416088/22-A)

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

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-10 (280-120138-1) and MW-13 (280-120138-2) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 03/18/2019.

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

Client Sample ID: MW-10 — Lab Sample ID: 280-120138-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.9		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.0011	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0018	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.066		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00057	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00028	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0066		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0058		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.059		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0064		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.084		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	1.8		0.50	0.060	mg/L	1		9056A	Total/NA

Client Sample ID: MW-13 — Lab Sample ID: 280-120138-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.57		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00060	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0051		0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.33		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.0027		0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00046	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.012		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.041		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0056	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.022		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0037	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00055	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Lithium	0.055		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-120138-1	MW-10	Water	02/13/19 09:34	02/13/19 12:20
280-120138-2	MW-13	Water	02/13/19 10:25	02/13/19 12:20

Client Sample Results

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Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-10
Lab Sample ID: 280-120138-1
Date Collected: 02/13/19 09:34
Matrix: Water
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.9		0.10	0.023	mg/L		02/18/19 14:00	02/19/19 20:16	1

Client Sample ID: MW-13
Lab Sample ID: 280-120138-2
Date Collected: 02/13/19 10:25
Matrix: Water
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.57		0.10	0.023	mg/L		02/18/19 14:00	02/19/19 20:48	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-10
Lab Sample ID: 280-120138-1
Date Collected: 02/13/19 09:34
Matrix: Water
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0011	J	0.0020	0.00057	mg/L		02/18/19 14:00	02/19/19 18:35	1
Arsenic	0.0018	J	0.0050	0.00075	mg/L		02/18/19 14:00	02/19/19 18:35	1
Barium	0.066		0.0050	0.0022	mg/L		02/18/19 14:00	02/19/19 18:35	1
Beryllium	0.00057	J	0.0010	0.00031	mg/L		02/18/19 14:00	02/19/19 18:35	1
Cadmium	0.00028	J	0.0010	0.00021	mg/L		02/18/19 14:00	02/19/19 18:35	1
Cobalt	0.0066		0.0010	0.00019	mg/L		02/18/19 14:00	02/19/19 18:35	1
Chromium	0.0058		0.0020	0.00098	mg/L		02/18/19 14:00	02/19/19 18:35	1
Molybdenum	0.059		0.010	0.0011	mg/L		02/18/19 14:00	02/19/19 18:35	1
Lead	ND		0.0010	0.00045	mg/L		02/18/19 14:00	02/19/19 18:35	1
Selenium	0.0064		0.0050	0.00089	mg/L		02/18/19 14:00	02/19/19 18:35	1
Thallium	ND		0.0010	0.00020	mg/L		02/18/19 14:00	02/19/19 18:35	1
Lithium	0.084		0.0080	0.0017	mg/L		02/18/19 14:00	02/19/19 18:35	1

Client Sample ID: MW-13
Lab Sample ID: 280-120138-2
Date Collected: 02/13/19 10:25
Matrix: Water
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00060	J	0.0020	0.00057	mg/L		02/18/19 14:00	02/19/19 18:46	1
Arsenic	0.0051		0.0050	0.00075	mg/L		02/18/19 14:00	02/19/19 18:46	1
Barium	0.33		0.0050	0.0022	mg/L		02/18/19 14:00	02/19/19 18:46	1
Beryllium	0.0027		0.0010	0.00031	mg/L		02/18/19 14:00	02/19/19 18:46	1
Cadmium	0.00046	J	0.0010	0.00021	mg/L		02/18/19 14:00	02/19/19 18:46	1
Cobalt	0.012		0.0010	0.00019	mg/L		02/18/19 14:00	02/19/19 18:46	1
Chromium	0.041		0.0020	0.00098	mg/L		02/18/19 14:00	02/19/19 18:46	1
Molybdenum	0.0056	J	0.010	0.0011	mg/L		02/18/19 14:00	02/19/19 18:46	1
Lead	0.022		0.0010	0.00045	mg/L		02/18/19 14:00	02/19/19 18:46	1
Selenium	0.0037	J	0.0050	0.00089	mg/L		02/18/19 14:00	02/19/19 18:46	1
Thallium	0.00055	J	0.0010	0.00020	mg/L		02/18/19 14:00	02/19/19 18:46	1
Lithium	0.055		0.0080	0.0017	mg/L		02/18/19 14:00	02/19/19 18:46	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-10
Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		02/18/19 12:00	02/20/19 09:01	1

Client Sample ID: MW-13
Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	F1	0.20	0.13	ug/L		02/18/19 12:00	02/20/19 08:54	1

General Chemistry

Client Sample ID: MW-10
Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.8**		0.50	0.060	mg/L			02/20/19 02:57	1

Client Sample ID: MW-13
Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**		0.50	0.060	mg/L			02/20/19 03:16	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-10
Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0814	U	0.0733	0.0736	1.00	0.112	pCi/L	02/21/19 13:30	03/15/19 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*02/21/19 13:30*	*03/15/19 07:58*	*1*

Client Sample ID: MW-13
Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20
Lab Sample ID: 280-120138-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**1.98**		0.410	0.447	1.00	0.238	pCi/L	02/21/19 13:30	03/15/19 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*67.6*		*40 - 110*	*02/21/19 13:30*	*03/15/19 07:58*	*1*

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120138-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-10
Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120138-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.383**		0.243	0.246	1.00	0.374	pCi/L	02/21/19 13:58	03/07/19 15:24	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*40 - 110*	*02/21/19 13:58*	*03/07/19 15:24*	*1*
Y Carrier	*82.2*		*40 - 110*	*02/21/19 13:58*	*03/07/19 15:24*	*1*

Client Sample ID: MW-13
Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120138-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.69**	**G**	0.897	0.911	1.00	1.36	pCi/L	02/21/19 13:58	03/07/19 15:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*67.6*		*40 - 110*	*02/21/19 13:58*	*03/07/19 15:21*	*1*
Y Carrier	*80.7*		*40 - 110*	*02/21/19 13:58*	*03/07/19 15:21*	*1*

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

Client Sample ID: MW-10
Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120138-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.465**		0.254	0.257	5.00	0.374	pCi/L		03/18/19 12:42	1

Client Sample ID: MW-13
Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120138-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**3.66**		0.986	1.01	5.00	1.36	pCi/L		03/18/19 12:42	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-368351/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368589 **Prep Batch: 368351**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		02/18/19 14:00	02/19/19 20:07	1

Lab Sample ID: LCS 240-368351/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368589 **Prep Batch: 368351**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.08		mg/L		108	80 - 120

Lab Sample ID: 280-120138-1 MS **Client Sample ID: MW-10**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368589 **Prep Batch: 368351**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	2.9		1.00	3.96		mg/L		103	75 - 125

Lab Sample ID: 280-120138-1 MSD **Client Sample ID: MW-10**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368589 **Prep Batch: 368351**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.9		1.00	3.98		mg/L		105	75 - 125	1	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-368351/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368724 **Prep Batch: 368351**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		02/18/19 14:00	02/19/19 18:31	1
Arsenic	ND		0.0050	0.00075	mg/L		02/18/19 14:00	02/19/19 18:31	1
Barium	ND		0.0050	0.0022	mg/L		02/18/19 14:00	02/19/19 18:31	1
Beryllium	ND		0.0010	0.00031	mg/L		02/18/19 14:00	02/19/19 18:31	1
Cadmium	ND		0.0010	0.00021	mg/L		02/18/19 14:00	02/19/19 18:31	1
Cobalt	ND		0.0010	0.00019	mg/L		02/18/19 14:00	02/19/19 18:31	1
Chromium	ND		0.0020	0.00098	mg/L		02/18/19 14:00	02/19/19 18:31	1
Molybdenum	ND		0.010	0.0011	mg/L		02/18/19 14:00	02/19/19 18:31	1
Lead	ND		0.0010	0.00045	mg/L		02/18/19 14:00	02/19/19 18:31	1
Selenium	ND		0.0050	0.00089	mg/L		02/18/19 14:00	02/19/19 18:31	1
Thallium	ND		0.0010	0.00020	mg/L		02/18/19 14:00	02/19/19 18:31	1
Lithium	ND		0.0080	0.0017	mg/L		02/18/19 14:00	02/19/19 18:31	1

Lab Sample ID: LCS 240-368351/3-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 368724 **Prep Batch: 368351**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.100		mg/L		100	80 - 120

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

Lab Sample ID: LCS 240-368351/3-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 368724
Prep Batch: 368351

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	0.975		mg/L		98	80 - 120
Barium	1.00	1.05		mg/L		105	80 - 120
Beryllium	1.00	1.03		mg/L		103	80 - 120
Cadmium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	0.994		mg/L		99	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120
Molybdenum	0.100	0.103		mg/L		103	80 - 120
Lead	1.00	1.05		mg/L		105	80 - 120
Selenium	1.00	1.04		mg/L		104	80 - 120
Thallium	0.250	0.260		mg/L		104	80 - 120
Lithium	0.100	0.0989		mg/L		99	80 - 120

Lab Sample ID: 280-120138-1 MS
Client Sample ID: MW-10
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 368724
Prep Batch: 368351

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0011	J	0.100	0.103		mg/L		102	75 - 125
Arsenic	0.0018	J	1.00	1.07		mg/L		107	75 - 125
Barium	0.066		1.00	1.11		mg/L		104	75 - 125
Beryllium	0.00057	J	1.00	1.08		mg/L		108	75 - 125
Cadmium	0.00028	J	1.00	0.970		mg/L		97	75 - 125
Cobalt	0.0066		1.00	1.04		mg/L		103	75 - 125
Chromium	0.0058		1.00	0.985		mg/L		98	75 - 125
Molybdenum	0.059		0.100	0.166		mg/L		108	75 - 125
Lead	ND		1.00	0.979		mg/L		98	75 - 125
Selenium	0.0064		1.00	1.03		mg/L		102	75 - 125
Thallium	ND		0.250	0.247		mg/L		99	75 - 125
Lithium	0.084		0.100	0.186		mg/L		102	75 - 125

Lab Sample ID: 280-120138-1 MSD
Client Sample ID: MW-10
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 368724
Prep Batch: 368351

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.0011	J	0.100	0.105		mg/L		103	75 - 125	2	20
Arsenic	0.0018	J	1.00	1.06		mg/L		105	75 - 125	2	20
Barium	0.066		1.00	1.12		mg/L		106	75 - 125	1	20
Beryllium	0.00057	J	1.00	1.07		mg/L		107	75 - 125	0	20
Cadmium	0.00028	J	1.00	0.978		mg/L		98	75 - 125	1	20
Cobalt	0.0066		1.00	1.02		mg/L		102	75 - 125	1	20
Chromium	0.0058		1.00	0.978		mg/L		97	75 - 125	1	20
Molybdenum	0.059		0.100	0.166		mg/L		107	75 - 125	0	20
Lead	ND		1.00	0.994		mg/L		99	75 - 125	2	20
Selenium	0.0064		1.00	1.03		mg/L		103	75 - 125	0	20
Thallium	ND		0.250	0.250		mg/L		100	75 - 125	1	20
Lithium	0.084		0.100	0.191		mg/L		107	75 - 125	2	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-368357/1-A
Matrix: Water
Analysis Batch: 368756

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 368357

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		02/18/19 12:00	02/20/19 08:50	1

Lab Sample ID: LCS 240-368357/2-A
Matrix: Water
Analysis Batch: 368756

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 368357

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.21		ug/L		104	80 - 120

Lab Sample ID: 280-120138-2 MS
Matrix: Water
Analysis Batch: 368756

Client Sample ID: MW-13
Prep Type: Total/NA
Prep Batch: 368357

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND	F1	1.00	1.37	F1	ug/L		137	80 - 120

Lab Sample ID: 280-120138-2 MSD
Matrix: Water
Analysis Batch: 368756

Client Sample ID: MW-13
Prep Type: Total/NA
Prep Batch: 368357

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND	F1	1.00	1.32	F1	ug/L		132	80 - 120	4	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-448097/6
Matrix: Water
Analysis Batch: 448097

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.060	mg/L			02/19/19 13:10	1

Lab Sample ID: LCS 280-448097/4
Matrix: Water
Analysis Batch: 448097

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	5.00	4.73		mg/L		95	90 - 110

Lab Sample ID: LCSD 280-448097/5
Matrix: Water
Analysis Batch: 448097

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	5.00	4.80		mg/L		96	90 - 110	1	10

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

Lab Sample ID: MRL 280-448097/3 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 448097

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.200	0.105	J	mg/L		53	50 - 150

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-416088/22-A | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 419466 | **Prep Batch: 416088**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.04701	U	0.0586	0.0588	1.00	0.0967	pCi/L	02/21/19 13:30	03/15/19 07:58	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*02/21/19 13:30*	*03/15/19 07:58*	*1*

Lab Sample ID: LCS 160-416088/1-A | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 419466 | **Prep Batch: 416088**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.15		1.15	1.00	0.103	pCi/L	98	68 - 137

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*102*		*40 - 110*

Lab Sample ID: LCSD 160-416088/2-A | **Client Sample ID: Lab Control Sample Dup**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 419466 | **Prep Batch: 416088**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	11.23		1.16	1.00	0.0877	pCi/L	99	68 - 137	0.04	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*100*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-416092/22-A | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 418047 | **Prep Batch: 416092**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.1328	U	0.205	0.205	1.00	0.385	pCi/L	02/21/19 13:58	03/07/19 15:21	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-416092/22-A
Matrix: Water
Analysis Batch: 418047

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 416092

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110	02/21/19 13:58	03/07/19 15:21	1
Y Carrier	85.2		40 - 110	02/21/19 13:58	03/07/19 15:21	1

Lab Sample ID: LCS 160-416092/1-A
Matrix: Water
Analysis Batch: 418048

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 416092

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.42	10.07		1.15	1.00	0.379	pCi/L	107	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	102		40 - 110
Y Carrier	78.5		40 - 110

Lab Sample ID: LCSD 160-416092/2-A
Matrix: Water
Analysis Batch: 418048

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 416092

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.42	9.478		1.09	1.00	0.357	pCi/L	101	56 - 140	0.26	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	100		40 - 110
Y Carrier	82.2		40 - 110

QC Association Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120138-1

Metals

Prep Batch: 368351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total Recoverable	Water	3005A	
280-120138-2	MW-13	Total Recoverable	Water	3005A	
MB 240-368351/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-368351/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-368351/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-120138-1 MS	MW-10	Total Recoverable	Water	3005A	
280-120138-1 MS	MW-10	Total Recoverable	Water	3005A	
280-120138-1 MSD	MW-10	Total Recoverable	Water	3005A	
280-120138-1 MSD	MW-10	Total Recoverable	Water	3005A	

Prep Batch: 368357

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total/NA	Water	7470A	
280-120138-2	MW-13	Total/NA	Water	7470A	
MB 240-368357/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-368357/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-120138-2 MS	MW-13	Total/NA	Water	7470A	
280-120138-2 MSD	MW-13	Total/NA	Water	7470A	

Analysis Batch: 368589

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total Recoverable	Water	6010C	368351
280-120138-2	MW-13	Total Recoverable	Water	6010C	368351
MB 240-368351/1-A	Method Blank	Total Recoverable	Water	6010C	368351
LCS 240-368351/2-A	Lab Control Sample	Total Recoverable	Water	6010C	368351
280-120138-1 MS	MW-10	Total Recoverable	Water	6010C	368351
280-120138-1 MSD	MW-10	Total Recoverable	Water	6010C	368351

Analysis Batch: 368724

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total Recoverable	Water	6020A	368351
280-120138-2	MW-13	Total Recoverable	Water	6020A	368351
MB 240-368351/1-A	Method Blank	Total Recoverable	Water	6020A	368351
LCS 240-368351/3-A	Lab Control Sample	Total Recoverable	Water	6020A	368351
280-120138-1 MS	MW-10	Total Recoverable	Water	6020A	368351
280-120138-1 MSD	MW-10	Total Recoverable	Water	6020A	368351

Analysis Batch: 368756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total/NA	Water	7470A	368357
280-120138-2	MW-13	Total/NA	Water	7470A	368357
MB 240-368357/1-A	Method Blank	Total/NA	Water	7470A	368357
LCS 240-368357/2-A	Lab Control Sample	Total/NA	Water	7470A	368357
280-120138-2 MS	MW-13	Total/NA	Water	7470A	368357
280-120138-2 MSD	MW-13	Total/NA	Water	7470A	368357

General Chemistry

Analysis Batch: 448097

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total/NA	Water	9056A	
280-120138-2	MW-13	Total/NA	Water	9056A	
MB 280-448097/6	Method Blank	Total/NA	Water	9056A	
LCS 280-448097/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-448097/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-448097/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 416088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total/NA	Water	PrecSep-21	
280-120138-2	MW-13	Total/NA	Water	PrecSep-21	
MB 160-416088/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-416088/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-416088/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 416092

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120138-1	MW-10	Total/NA	Water	PrecSep_0	
280-120138-2	MW-13	Total/NA	Water	PrecSep_0	
MB 160-416092/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-416092/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-416092/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120138-1

Client Sample ID: MW-10

Lab Sample ID: 280-120138-1

Date Collected: 02/13/19 09:34
Date Received: 02/13/19 12:20

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	368351	02/18/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			368589	02/19/19 20:16	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	368351	02/18/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			368724	02/19/19 18:35	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	368357	02/18/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			368756	02/20/19 09:01	AJC	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	448097	02/20/19 02:57	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.79 mL	1.0 g	416088	02/21/19 13:30	SJC	TAL SL
Total/NA	Analysis	9315		1			419466	03/15/19 07:58	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.79 mL	1.0 g	416092	02/21/19 13:58	SJC	TAL SL
Total/NA	Analysis	9320		1			418048	03/07/19 15:24	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			419804	03/18/19 12:42	CDR	TAL SL

Client Sample ID: MW-13

Lab Sample ID: 280-120138-2

Date Collected: 02/13/19 10:25
Date Received: 02/13/19 12:20

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	368351	02/18/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			368589	02/19/19 20:48	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	368351	02/18/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			368724	02/19/19 18:46	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	368357	02/18/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			368756	02/20/19 08:54	AJC	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	448097	02/20/19 03:16	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			499.72 mL	1.0 g	416088	02/21/19 13:30	SJC	TAL SL
Total/NA	Analysis	9315		1			419466	03/15/19 07:58	KLS	TAL SL
Total/NA	Prep	PrecSep_0			499.72 mL	1.0 g	416092	02/21/19 13:58	SJC	TAL SL
Total/NA	Analysis	9320		1			418047	03/07/19 15:21	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			419804	03/18/19 12:42	CDR	TAL SL

Laboratory References:

TAL CAN = TestAmerica Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100
TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120138-1

Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19 *
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Alaska	State Program	10	MO00054	06-30-19
ANAB	DoD / DOE		L2305.01	04-06-22
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-19
Connecticut	State Program	1	PH-0241	03-31-19 *
Florida	NELAP	4	E87689	06-30-19
Hawaii	State Program	9	NA	06-30-19
Illinois	NELAP	5	200023	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA011	12-31-19
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-19
Missouri	State Program	7	780	06-30-19
Nevada	State Program	9	MO000542018-1	07-31-19
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19 *
North Dakota	State Program	8	R207	06-30-19

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

Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Identification Number	Expiration Date
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-19
Pennsylvania	NELAP	3	68-00540	02-28-19 *
South Carolina	State Program	4	85002001	06-30-19
Texas	NELAP	6	T104704193-18-13	07-31-19
US Fish & Wildlife	Federal		058448	07-31-19
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19

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

Chain of Custody Record

Sampler ID ________

Temperature on Receipt ________

Drinking Water? Yes ☐ No ☐

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

Client: HDR	Project Manager: Matt Rohr	Date: 2-13-19	Chain of Custody Number: 179099
Address: 9781 S. Meridian Blvd, Suite 400	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 1
City: Englewood; State: CO; Zip Code: 80112	Site Contact: A. Morgan; Lab Contact: Bundy, Darlene F		
Project Name and Location (State): Xcel Energy GWeek Cherokee	Carrier/Waybill Number:		
Contract/Purchase Order/Quote No.: Project # 28 014371			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Total Metals	Anions (Floride)	Ra 226/228	Special Instructions/Conditions of Receipt
MW-10	2-13-19	0934		X			X		X				X	X	X	metals are App IV +
MW-13	2-12-19	1025		X			X		X				X	X	X	Boron

280-120138 Chain of Custody

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

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

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other ________

QC Requirements (Specify)

1. Relinquished By: [signature]	Date: 2-13-19	Time: 1223	1. Received By: [signature]	Date: 2/13/19	Time: 1220
2. Relinquished By:	Date:	Time:	2. Received By:	Date:	Time:
3. Relinquished By:	Date:	Time:	3. Received By:	Date:	Time:

Comments: 1.8, 0.9°C +1.0°C transfered by PED 2/13/19

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-472317.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-120138-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 3/14/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-10 (280-120138-1)	2/13/19	09:34 Mountain		Water			X	X	X	2	
MW-13 (280-120138-2)	2/13/19	10:25 Mountain		Water			X	X	X	2	

Preservation Codes:

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

Other:

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 02-14-19 1630	Company: PADEN	Received by: Michael Heim	Date/Time: 2/15/19 0850	Company: MST
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 09/20/2016

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

0,5 / C6,5

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-472316.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-120138-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 3/11/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

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

Other:

SSC

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 12 T. Metals (w/collision cell) - ApplV	6010C/3005A Boron	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-10 (280-120138-1)	2/13/19	09:34 Mountain		Water			X	X	X	1	Use Collision Cell
MW-13 (280-120138-2)	2/13/19	10:25 Mountain		Water			X	X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification Unconfirmed	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
KGA	02-14-19 1500	TADEN	[signature]	2-15-19 925	TAC

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

Ver: 09/20/2016

TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client TA Denver Site Name

Cooler unpacked by: MHA

Cooler Received on 2-15-19 Opened on 2-15-19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.2** °C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
   IR GUN #36 (CF **+0**°C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.5 °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity ____ Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC854592**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ Yes No
16. Was a LL Hg or Me Hg trip blank present? ____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____.

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-120138-1

Login Number: 120138
List Number: 1
Creator: Quint, Jessica A

List Source: TestAmerica Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc — Job Number: 280-120138-1

Login Number: 120138
List Number: 2
Creator: Hellm, Michael

List Source: TestAmerica St. Louis
List Creation: 02/15/19 12:27 PM

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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.1
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	

Tracer/Carrier Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120138-1

Method: 9315 - Radium-226 (GFPC)

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

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-120138-1	MW-10	101
280-120138-2	MW-13	67.6
LCS 160-416088/1-A	Lab Control Sample	102
LCSD 160-416088/2-A	Lab Control Sample Dup	100
MB 160-416088/22-A	Method Blank	104

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

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

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-120138-1	MW-10	101	82.2
280-120138-2	MW-13	67.6	80.7
LCS 160-416092/1-A	Lab Control Sample	102	78.5
LCSD 160-416092/2-A	Lab Control Sample Dup	100	82.2
MB 160-416092/22-A	Method Blank	104	85.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-120140-1

Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
2/27/2019 5:19:25 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

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Qualifiers

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
B	Compound was found in the blank and sample.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
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)
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)

Job ID: 280-120140-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-120140-1

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

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

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

RECEIPT
The samples were received on 2/13/2019 12:20 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.9º C and 2.8º C.

TOTAL RECOVERABLE METALS
Samples MW-14 (280-120140-1), MW-15 (280-120140-2), MW-16 (280-120140-3), MW-17 (280-120140-4), MW-16D (280-120140-5) and MW-14EB (280-120140-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/14/2019 and analyzed on 02/15/2019.

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

TOTAL DISSOLVED SOLIDS
Samples MW-14 (280-120140-1), MW-15 (280-120140-2), MW-16 (280-120140-3), MW-17 (280-120140-4), MW-16D (280-120140-5) and MW-14EB (280-120140-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 02/15/2019.

Total Dissolved Solids (TDS) was detected in method blank MB 280-447837/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

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

CORROSIVITY (PH)
Samples MW-14 (280-120140-1), MW-15 (280-120140-2), MW-16 (280-120140-3), MW-17 (280-120140-4), MW-16D (280-120140-5) and MW-14EB (280-120140-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 02/15/2019 and 02/18/2019.

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

ANIONS (28 DAYS)
Samples MW-14 (280-120140-1), MW-15 (280-120140-2), MW-16 (280-120140-3), MW-17 (280-120140-4), MW-16D (280-120140-5) and MW-14EB (280-120140-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were

Job ID: 280-120140-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

analyzed on 02/19/2019.

Samples MW-14 (280-120140-1)[20X], MW-15 (280-120140-2)[2X], MW-15 (280-120140-2)[20X], MW-16 (280-120140-3)[20X], MW-17 (280-120140-4)[5X] and MW-16D (280-120140-5)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The followings sample was analyzed at a dilution due to the Matrix Conductivity Threshold (MCT) of the instrument for fluoride, method 9056A_28D, batch 447990: MW-15 (280-120140-2). The reporting limits have been adjusted accordingly.

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

Detection Summary

Client: HDR Inc | TestAmerica Job ID: 280-120140-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 | Lab Sample ID: 280-120140-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1500		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	190000		200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	830		60	20	mg/L	20		9056A	Total/NA
Fluoride	3.4		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1600		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2100	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-15 | Lab Sample ID: 280-120140-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1400		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	450000		200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	960		60	20	mg/L	20		9056A	Total/NA
Fluoride	0.84	J	1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	2000		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	3700	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16 | Lab Sample ID: 280-120140-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	730		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	280000		200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	400		60	20	mg/L	20		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	850		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2300	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17 | Lab Sample ID: 280-120140-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	840		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	91000		200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	100		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	1.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	300		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	780	B	20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client Sample ID: MW-16D

Lab Sample ID: 280-120140-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	710		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	270000		200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	410		60	20	mg/L	20		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	870		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2200	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-14EB

Lab Sample ID: 280-120140-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	150	J	200	78	ug/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	5.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120140-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL DEN

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 DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120140-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-120140-1	MW-14	Water	02/12/19 08:00	02/13/19 12:20
280-120140-2	MW-15	Water	02/11/19 13:05	02/13/19 12:20
280-120140-3	MW-16	Water	02/11/19 10:08	02/13/19 12:20
280-120140-4	MW-17	Water	02/11/19 11:25	02/13/19 12:20
280-120140-5	MW-16D	Water	02/11/19 10:08	02/13/19 12:20
280-120140-6	MW-14EB	Water	02/12/19 08:30	02/13/19 12:20

Client: HDR Inc | TestAmerica Job ID: 280-120140-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-14 | **Lab Sample ID: 280-120140-1**
Date Collected: 02/12/19 08:00 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1500		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:28	1
Calcium	190000		200	78	ug/L		02/14/19 16:30	02/15/19 03:28	1

Client Sample ID: MW-15 | **Lab Sample ID: 280-120140-2**
Date Collected: 02/11/19 13:05 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1400		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:45	1
Calcium	450000		200	78	ug/L		02/14/19 16:30	02/15/19 03:45	1

Client Sample ID: MW-16 | **Lab Sample ID: 280-120140-3**
Date Collected: 02/11/19 10:08 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	730		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:48	1
Calcium	280000		200	78	ug/L		02/14/19 16:30	02/15/19 03:48	1

Client Sample ID: MW-17 | **Lab Sample ID: 280-120140-4**
Date Collected: 02/11/19 11:25 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	840		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:52	1
Calcium	91000		200	78	ug/L		02/14/19 16:30	02/15/19 03:52	1

Client Sample ID: MW-16D | **Lab Sample ID: 280-120140-5**
Date Collected: 02/11/19 10:08 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	710		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:55	1
Calcium	270000		200	78	ug/L		02/14/19 16:30	02/15/19 03:55	1

Client Sample ID: MW-14EB | **Lab Sample ID: 280-120140-6**
Date Collected: 02/12/19 08:30 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	4.4	ug/L		02/14/19 16:30	02/15/19 04:12	1
Calcium	150	J	200	78	ug/L		02/14/19 16:30	02/15/19 04:12	1

General Chemistry

Client Sample ID: MW-14 | **Lab Sample ID: 280-120140-1**
Date Collected: 02/12/19 08:00 | **Matrix: Water**
Date Received: 02/13/19 12:20

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			02/15/19 17:41	1
Temperature	22.7	HF	1.0	1.0	Degrees C			02/15/19 17:41	1
Chloride	830		60	20	mg/L			02/19/19 01:08	20
Fluoride	3.4		0.50	0.060	mg/L			02/19/19 00:50	1
Sulfate	1600		100	21	mg/L			02/19/19 01:08	20
Total Dissolved Solids (TDS)	2100	B	40	19	mg/L			02/15/19 14:27	1

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-120140-1

General Chemistry

Client Sample ID: MW-15
Date Collected: 02/11/19 13:05
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120140-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU			02/15/19 17:45	1
Temperature	22.5	HF	1.0	1.0	Degrees C			02/15/19 17:45	1
Chloride	960		60	20	mg/L			02/19/19 01:46	20
Fluoride	0.84	J	1.0	0.12	mg/L			02/19/19 01:27	2
Sulfate	2000		100	21	mg/L			02/19/19 01:46	20
Total Dissolved Solids (TDS)	3700	B	40	19	mg/L			02/15/19 14:27	1

Client Sample ID: MW-16
Date Collected: 02/11/19 10:08
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120140-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			02/15/19 17:52	1
Temperature	22.7	HF	1.0	1.0	Degrees C			02/15/19 17:52	1
Chloride	400		60	20	mg/L			02/19/19 02:23	20
Fluoride	2.0		0.50	0.060	mg/L			02/19/19 02:05	1
Sulfate	850		100	21	mg/L			02/19/19 02:23	20
Total Dissolved Solids (TDS)	2300	B	40	19	mg/L			02/15/19 14:27	1

Client Sample ID: MW-17
Date Collected: 02/11/19 11:25
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120140-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU			02/15/19 18:02	1
Temperature	23.1	HF	1.0	1.0	Degrees C			02/15/19 18:02	1
Chloride	100		3.0	1.0	mg/L			02/19/19 02:42	1
Fluoride	1.3		0.50	0.060	mg/L			02/19/19 02:42	1
Sulfate	300		25	5.2	mg/L			02/19/19 03:38	5
Total Dissolved Solids (TDS)	780	B	20	9.4	mg/L			02/15/19 14:27	1

Client Sample ID: MW-16D
Date Collected: 02/11/19 10:08
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120140-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			02/15/19 17:57	1
Temperature	23.0	HF	1.0	1.0	Degrees C			02/15/19 17:57	1
Chloride	410		60	20	mg/L			02/19/19 04:16	20
Fluoride	2.0		0.50	0.060	mg/L			02/19/19 03:57	1
Sulfate	870		100	21	mg/L			02/19/19 04:16	20
Total Dissolved Solids (TDS)	2200	B	40	19	mg/L			02/15/19 14:27	1

Client Sample ID: MW-14EB
Date Collected: 02/12/19 08:30
Date Received: 02/13/19 12:20

Lab Sample ID: 280-120140-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.6	HF	0.1	0.1	SU			02/18/19 13:10	1
Temperature	21.5	HF	1.0	1.0	Degrees C			02/18/19 13:10	1
Chloride	ND		3.0	1.0	mg/L			02/19/19 04:34	1
Fluoride	ND		0.50	0.060	mg/L			02/19/19 04:34	1
Sulfate	ND		5.0	1.0	mg/L			02/19/19 04:34	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			02/15/19 14:27	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-447680/1-A
Matrix: Water
Analysis Batch: 447771

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 447680

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	4.4	ug/L		02/14/19 16:30	02/15/19 03:07	1
Calcium	ND		200	78	ug/L		02/14/19 16:30	02/15/19 03:07	1

Lab Sample ID: LCS 280-447680/2-A
Matrix: Water
Analysis Batch: 447771

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 447680

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	992		ug/L		99	86 - 110
Calcium	50000	49600		ug/L		99	90 - 111

Lab Sample ID: 280-120140-1 MS
Matrix: Water
Analysis Batch: 447771

Client Sample ID: MW-14
Prep Type: Total Recoverable
Prep Batch: 447680

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1500		1000	2480		ug/L		99	87 - 113
Calcium	190000		50000	233000		ug/L		86	48 - 153

Lab Sample ID: 280-120140-1 MSD
Matrix: Water
Analysis Batch: 447771

Client Sample ID: MW-14
Prep Type: Total Recoverable
Prep Batch: 447680

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1500		1000	2480		ug/L		98	87 - 113	0	20
Calcium	190000		50000	231000		ug/L		84	48 - 153	1	20

Method: 9040B - pH

Lab Sample ID: LCS 280-447950/29
Matrix: Water
Analysis Batch: 447950

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 280-448024/29
Matrix: Water
Analysis Batch: 448024

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 280-448024/4
Matrix: Water
Analysis Batch: 448024

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-447990/6 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447990

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			02/18/19 14:33	1
Fluoride	ND		0.50	0.060	mg/L			02/18/19 14:33	1
Sulfate	ND		5.0	1.0	mg/L			02/18/19 14:33	1

Lab Sample ID: LCS 280-447990/4 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447990

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.3		mg/L		99	90 - 110
Fluoride	5.00	5.00		mg/L		100	90 - 110
Sulfate	100	101		mg/L		101	90 - 110

Lab Sample ID: LCSD 280-447990/5 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447990

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.4		mg/L		99	90 - 110	0	10
Fluoride	5.00	5.00		mg/L		100	90 - 110	0	10
Sulfate	100	101		mg/L		101	90 - 110	0	10

Lab Sample ID: MRL 280-447990/3 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447990

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.22	J	mg/L		89	50 - 150
Fluoride	0.200	0.106	J	mg/L		53	50 - 150
Sulfate	2.50	2.59	J	mg/L		104	50 - 150

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

Lab Sample ID: MB 280-447837/1 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447837

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	7.00	J	10	4.7	mg/L			02/15/19 14:27	1

Lab Sample ID: LCS 280-447837/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 447837

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	515		mg/L		103	93 - 110

Metals

Prep Batch: 447680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-1	MW-14	Total Recoverable	Water	3005A	
280-120140-2	MW-15	Total Recoverable	Water	3005A	
280-120140-3	MW-16	Total Recoverable	Water	3005A	
280-120140-4	MW-17	Total Recoverable	Water	3005A	
280-120140-5	MW-16D	Total Recoverable	Water	3005A	
280-120140-6	MW-14EB	Total Recoverable	Water	3005A	
MB 280-447680/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-447680/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-120140-1 MS	MW-14	Total Recoverable	Water	3005A	
280-120140-1 MSD	MW-14	Total Recoverable	Water	3005A	

Analysis Batch: 447771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-1	MW-14	Total Recoverable	Water	6010C	447680
280-120140-2	MW-15	Total Recoverable	Water	6010C	447680
280-120140-3	MW-16	Total Recoverable	Water	6010C	447680
280-120140-4	MW-17	Total Recoverable	Water	6010C	447680
280-120140-5	MW-16D	Total Recoverable	Water	6010C	447680
280-120140-6	MW-14EB	Total Recoverable	Water	6010C	447680
MB 280-447680/1-A	Method Blank	Total Recoverable	Water	6010C	447680
LCS 280-447680/2-A	Lab Control Sample	Total Recoverable	Water	6010C	447680
280-120140-1 MS	MW-14	Total Recoverable	Water	6010C	447680
280-120140-1 MSD	MW-14	Total Recoverable	Water	6010C	447680

General Chemistry

Analysis Batch: 447837

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-1	MW-14	Total/NA	Water	SM 2540C	
280-120140-2	MW-15	Total/NA	Water	SM 2540C	
280-120140-3	MW-16	Total/NA	Water	SM 2540C	
280-120140-4	MW-17	Total/NA	Water	SM 2540C	
280-120140-5	MW-16D	Total/NA	Water	SM 2540C	
280-120140-6	MW-14EB	Total/NA	Water	SM 2540C	
MB 280-447837/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-447837/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 447950

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-1	MW-14	Total/NA	Water	9040B	
280-120140-2	MW-15	Total/NA	Water	9040B	
280-120140-3	MW-16	Total/NA	Water	9040B	
280-120140-4	MW-17	Total/NA	Water	9040B	
280-120140-5	MW-16D	Total/NA	Water	9040B	
LCS 280-447950/29	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 447990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-1	MW-14	Total/NA	Water	9056A	
280-120140-1	MW-14	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 447990 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-2	MW-15	Total/NA	Water	9056A	
280-120140-2	MW-15	Total/NA	Water	9056A	
280-120140-3	MW-16	Total/NA	Water	9056A	
280-120140-3	MW-16	Total/NA	Water	9056A	
280-120140-4	MW-17	Total/NA	Water	9056A	
280-120140-4	MW-17	Total/NA	Water	9056A	
280-120140-5	MW-16D	Total/NA	Water	9056A	
280-120140-5	MW-16D	Total/NA	Water	9056A	
280-120140-6	MW-14EB	Total/NA	Water	9056A	
MB 280-447990/6	Method Blank	Total/NA	Water	9056A	
LCS 280-447990/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-447990/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-447990/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 448024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-120140-6	MW-14EB	Total/NA	Water	9040B	
LCS 280-448024/29	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-448024/4	Lab Control Sample	Total/NA	Water	9040B	

Lab Chronicle

Client: HDR Inc TestAmerica Job ID: 280-120140-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 Lab Sample ID: 280-120140-1
Date Collected: 02/12/19 08:00 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 03:28	CML	TAL DEN
Total/NA	Analysis	9040B		1			447950	02/15/19 17:41	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	447990	02/19/19 00:50	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	447990	02/19/19 01:08	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Client Sample ID: MW-15 Lab Sample ID: 280-120140-2
Date Collected: 02/11/19 13:05 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 03:45	CML	TAL DEN
Total/NA	Analysis	9040B		1			447950	02/15/19 17:45	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	447990	02/19/19 01:27	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	447990	02/19/19 01:46	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Client Sample ID: MW-16 Lab Sample ID: 280-120140-3
Date Collected: 02/11/19 10:08 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 03:48	CML	TAL DEN
Total/NA	Analysis	9040B		1			447950	02/15/19 17:52	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	447990	02/19/19 02:05	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	447990	02/19/19 02:23	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Client Sample ID: MW-17 Lab Sample ID: 280-120140-4
Date Collected: 02/11/19 11:25 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 03:52	CML	TAL DEN
Total/NA	Analysis	9040B		1			447950	02/15/19 18:02	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	447990	02/19/19 02:42	TLP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	447990	02/19/19 03:38	TLP	TAL DEN

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Client Sample ID: MW-17 Lab Sample ID: 280-120140-4

Date Collected: 02/11/19 11:25 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Client Sample ID: MW-16D Lab Sample ID: 280-120140-5

Date Collected: 02/11/19 10:08 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 03:55	CML	TAL DEN
Total/NA	Analysis	9040B		1			447950	02/15/19 17:57	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	447990	02/19/19 03:57	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	447990	02/19/19 04:16	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Client Sample ID: MW-14EB Lab Sample ID: 280-120140-6

Date Collected: 02/12/19 08:30 **Matrix: Water**
Date Received: 02/13/19 12:20

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	447680	02/14/19 16:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			447771	02/15/19 04:12	CML	TAL DEN
Total/NA	Analysis	9040B		1			448024	02/18/19 13:10	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	447990	02/19/19 04:34	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	447837	02/15/19 14:27	SGB	TAL DEN

Laboratory References:

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

Denver #280

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: A. Morgan	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-75432-24917.1
Client Contact: Molly Reeves	Phone: 832-418-3307	E-Mail: darlene.bandy@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc		Analysis Requested		Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			Preservation Codes:
City: Englewood	TAT Requested (days):			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #:			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Colorado	SSOW#:			Other:

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	TDS	TSS	pH, Fluoride, Chloride, Sulfate / Anions	Ra226/Ra228 Combined	App III - Total Metals - Calcium, Boron	App IV - Total Metals (see list)	Total Number of containers	Special Instructions/Note:
				Preservation Code:			N	N	N	D	D	D		
MW-14	2-12-19	0800	G	Water	N	N	X		X		X			3 bottles
MW-15	2-11-19	1305	G	Water	N	N	X		X		X			3 bottles
MW-16	2-11-19	1008	G	Water	N	N	X		X		X			3 bottles
MW-17	2-11-19	1125	G	Water	N	N	X		X		X			3 bottles
MW-16D	2-11-19	1008	6	Water	N	N	X		X		X			3 bottles
~~MW-~~				~~Water~~										AM
~~MW-~~				~~Water~~										AM
~~MW-~~				~~Water~~										AM
~~MW-~~				~~Water~~										AM
~~DUP~~														AM
~~EB-~~ AM MW-14EB	2-12-19	0830	6	Water	N	N	X		X		X			3 bottles

280-120140 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	2-13-19 / 1223	HDR	[signature]	2/13/19 1220	TA DEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.9, 1.8°C + 1.0°C transferred by ARD 2/13/19 OTTPO

Ver: 08/04/2016

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-120140-1

Login Number: 120140
List Number: 1
Creator: Quint, Jessica A

List Source: TestAmerica Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

eurofins | Environment Testing
TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-122328-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
4/26/2019 9:22:33 PM

Darlene Bandy, Project Manager I
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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

Qualifiers

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
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)
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)

Job ID: 280-122328-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-122328-1

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

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

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

RECEIPT
The samples were received on 4/10/2019 4:22 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.4º C.

Receipt Exceptions

The requested App III Metals analysis were performed by TestAmerica's Canton laboratory.

TOTAL RECOVERABLE METALS
Samples MW-14 (280-122328-1), MW-15 (280-122328-2), MW-16 (280-122328-3), MW-17 (280-122328-4), MW-15EB (280-122328-5), MW-16D (280-122328-6) and MW-13 (280-122328-7) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/15/2019 and analyzed on 04/16/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)
Samples MW-14 (280-122328-1), MW-15 (280-122328-2), MW-16 (280-122328-3), MW-17 (280-122328-4), MW-15EB (280-122328-5), MW-16D (280-122328-6) and MW-13 (280-122328-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 04/15/2019 and analyzed on 04/16/2019.

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

TOTAL DISSOLVED SOLIDS
Samples MW-14 (280-122328-1), MW-15 (280-122328-2), MW-16 (280-122328-3), MW-17 (280-122328-4), MW-15EB (280-122328-5), MW-16D (280-122328-6) and MW-13 (280-122328-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 04/15/2019, 04/16/2019 and 04/18/2019.

Reanalysis of the following sample was performed outside of the analytical holding time due to a detection in the method blank as well as a detection in the sample greater than the reporting limit (RL) in the original analysis: MW-15EB (280-122328-5). This sample was reanalyzed 2 days after the 7 day hold time had expired. As instructed by the client, the reanalysis result has been qualified and reported.

Total Dissolved Solids (TDS) was detected in method blank MB 280-454670/1 at a level that was above the method detection limit but

Job ID: 280-122328-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

Total Dissolved Solids (TDS) was detected in method blank MB 280-454819/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details. Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the method blank. Sample MW-15EB (280-122328-5) is being reanalyzed.

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

CORROSIVITY (PH)
Samples MW-14 (280-122328-1), MW-15 (280-122328-2), MW-16 (280-122328-3), MW-17 (280-122328-4), MW-15EB (280-122328-5), MW-16D (280-122328-6) and MW-13 (280-122328-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 04/12/2019 and 04/16/2019.

The following sample did not converge to constant pH within an interval of 0.05 after three measurements: MW-15EB (280-122328-5). This behavior was also observed in a previous analysis of this sample.

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

ANIONS (28 DAYS)
Samples MW-14 (280-122328-1), MW-15 (280-122328-2), MW-16 (280-122328-3), MW-17 (280-122328-4), MW-15EB (280-122328-5), MW-16D (280-122328-6) and MW-13 (280-122328-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 04/14/2019 and 04/15/2019.

Samples MW-14 (280-122328-1)[10X], MW-15 (280-122328-2)[20X], MW-16 (280-122328-3)[20X], MW-17 (280-122328-4)[10X], MW-16D (280-122328-6)[20X] and MW-13 (280-122328-7)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

Detection Summary

Client: HDR Inc
Job ID: 280-122328-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14
Lab Sample ID: 280-122328-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.5		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	180000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	360		30	10	mg/L	10		9056A	Total/NA
Fluoride	2.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	420		50	10	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1500	B	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-15
Lab Sample ID: 280-122328-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.2		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	270000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	480		60	20	mg/L	20		9056A	Total/NA
Fluoride	1.4		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1000		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2500	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16
Lab Sample ID: 280-122328-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.77		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	280000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	540		60	20	mg/L	20		9056A	Total/NA
Fluoride	2.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1000		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2600	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17
Lab Sample ID: 280-122328-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.58		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	160000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	240		30	10	mg/L	10		9056A	Total/NA
Fluoride	1.4		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	520		50	10	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1400	B	20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc
Job ID: 280-122328-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-15EB — Lab Sample ID: 280-122328-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	5.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Total Dissolved Solids (TDS)	8.0	J H	10	4.7	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16D — Lab Sample ID: 280-122328-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.77		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	280000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	520		60	20	mg/L	20		9056A	Total/NA
Fluoride	2.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1000		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2600	B	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-13 — Lab Sample ID: 280-122328-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.52		0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	120000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	150		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	240		50	10	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	930	B	20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Job ID: 280-122328-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

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 CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-122328-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-122328-1	MW-14	Water	04/10/19 11:45	04/10/19 16:22
280-122328-2	MW-15	Water	04/09/19 11:10	04/10/19 16:22
280-122328-3	MW-16	Water	04/09/19 12:45	04/10/19 16:22
280-122328-4	MW-17	Water	04/09/19 14:00	04/10/19 16:22
280-122328-5	MW-15EB	Water	04/09/19 11:30	04/10/19 16:22
280-122328-6	MW-16D	Water	04/09/19 12:45	04/10/19 16:22
280-122328-7	MW-13	Water	04/10/19 10:57	04/10/19 16:22

1 2 3 4 5 6 7 8 9 10 11 12 13 14

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-14
Date Collected: 04/10/19 11:45
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.5		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 11:40	1

Client Sample ID: MW-15
Date Collected: 04/09/19 11:10
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.2		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 11:44	1

Client Sample ID: MW-16
Date Collected: 04/09/19 12:45
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.77		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 11:48	1

Client Sample ID: MW-17
Date Collected: 04/09/19 14:00
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.58		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 11:53	1

Client Sample ID: MW-15EB
Date Collected: 04/09/19 11:30
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 11:57	1

Client Sample ID: MW-16D
Date Collected: 04/09/19 12:45
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.77		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 13:02	1

Client Sample ID: MW-13
Date Collected: 04/10/19 10:57
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.52		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 13:06	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-14
Date Collected: 04/10/19 11:45
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	180000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:22	1

Client Sample ID: MW-15
Date Collected: 04/09/19 11:10
Date Received: 04/10/19 16:22

Lab Sample ID: 280-122328-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	270000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:25	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-16
Lab Sample ID: 280-122328-3
Date Collected: 04/09/19 12:45
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	280000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:27	1

Client Sample ID: MW-17
Lab Sample ID: 280-122328-4
Date Collected: 04/09/19 14:00
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	160000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:29	1

Client Sample ID: MW-15EB
Lab Sample ID: 280-122328-5
Date Collected: 04/09/19 11:30
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1000	580	ug/L		04/15/19 14:00	04/16/19 16:32	1

Client Sample ID: MW-16D
Lab Sample ID: 280-122328-6
Date Collected: 04/09/19 12:45
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	280000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:34	1

Client Sample ID: MW-13
Lab Sample ID: 280-122328-7
Date Collected: 04/10/19 10:57
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	120000		1000	580	ug/L		04/15/19 14:00	04/16/19 16:37	1

General Chemistry

Client Sample ID: MW-14
Lab Sample ID: 280-122328-1
Date Collected: 04/10/19 11:45
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			04/12/19 16:39	1
Temperature	21.9	HF	1.0	1.0	Degrees C			04/12/19 16:39	1
Chloride	360		30	10	mg/L			04/14/19 21:55	10
Fluoride	2.3		0.50	0.060	mg/L			04/14/19 21:37	1
Sulfate	420		50	10	mg/L			04/14/19 21:55	10
Total Dissolved Solids (TDS)	1500	B	20	9.4	mg/L			04/16/19 16:32	1

Client Sample ID: MW-15
Lab Sample ID: 280-122328-2
Date Collected: 04/09/19 11:10
Matrix: Water
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU			04/12/19 16:49	1
Temperature	22.0	HF	1.0	1.0	Degrees C			04/12/19 16:49	1
Chloride	480		60	20	mg/L			04/14/19 22:33	20
Fluoride	1.4		0.50	0.060	mg/L			04/14/19 22:14	1
Sulfate	1000		100	21	mg/L			04/14/19 22:33	20
Total Dissolved Solids (TDS)	2500	B	40	19	mg/L			04/15/19 20:54	1

General Chemistry

Client Sample ID: MW-16 — **Lab Sample ID: 280-122328-3**
Date Collected: 04/09/19 12:45 — **Matrix: Water**
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			04/12/19 17:00	1
Temperature	22.0	HF	1.0	1.0	Degrees C			04/12/19 17:00	1
Chloride	540		60	20	mg/L			04/14/19 23:10	20
Fluoride	2.1		0.50	0.060	mg/L			04/14/19 22:52	1
Sulfate	1000		100	21	mg/L			04/14/19 23:10	20
Total Dissolved Solids (TDS)	2600	B	40	19	mg/L			04/15/19 20:54	1

Client Sample ID: MW-17 — **Lab Sample ID: 280-122328-4**
Date Collected: 04/09/19 14:00 — **Matrix: Water**
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU			04/12/19 16:29	1
Temperature	21.7	HF	1.0	1.0	Degrees C			04/12/19 16:29	1
Chloride	240		30	10	mg/L			04/14/19 23:48	10
Fluoride	1.4		0.50	0.060	mg/L			04/14/19 23:29	1
Sulfate	520		50	10	mg/L			04/14/19 23:48	10
Total Dissolved Solids (TDS)	1400	B	20	9.4	mg/L			04/15/19 20:54	1

Client Sample ID: MW-15EB — **Lab Sample ID: 280-122328-5**
Date Collected: 04/09/19 11:30 — **Matrix: Water**
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.4	HF	0.1	0.1	SU			04/16/19 14:13	1
Temperature	21.4	HF	1.0	1.0	Degrees C			04/16/19 14:13	1
Chloride	ND		3.0	1.0	mg/L			04/15/19 00:06	1
Fluoride	ND		0.50	0.060	mg/L			04/15/19 00:06	1
Sulfate	ND		5.0	1.0	mg/L			04/15/19 00:06	1
Total Dissolved Solids (TDS)	8.0	J H	10	4.7	mg/L			04/18/19 16:23	1

Client Sample ID: MW-16D — **Lab Sample ID: 280-122328-6**
Date Collected: 04/09/19 12:45 — **Matrix: Water**
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.3	HF	0.1	0.1	SU			04/12/19 16:45	1
Temperature	22.1	HF	1.0	1.0	Degrees C			04/12/19 16:45	1
Chloride	520		60	20	mg/L			04/15/19 01:21	20
Fluoride	2.1		0.50	0.060	mg/L			04/15/19 01:03	1
Sulfate	1000		100	21	mg/L			04/15/19 01:21	20
Total Dissolved Solids (TDS)	2600	B	40	19	mg/L			04/15/19 20:54	1

Client Sample ID: MW-13 — **Lab Sample ID: 280-122328-7**
Date Collected: 04/10/19 10:57 — **Matrix: Water**
Date Received: 04/10/19 16:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			04/12/19 16:34	1
Temperature	21.7	HF	1.0	1.0	Degrees C			04/12/19 16:34	1
Chloride	150		3.0	1.0	mg/L			04/15/19 01:40	1
Fluoride	1.1		0.50	0.060	mg/L			04/15/19 01:40	1
Sulfate	240		50	10	mg/L			04/15/19 01:59	10
Total Dissolved Solids (TDS)	930	B	20	9.4	mg/L			04/16/19 16:32	1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-376507/1-A
Matrix: Water
Analysis Batch: 376844

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 376507

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		04/15/19 14:00	04/16/19 10:31	1

Lab Sample ID: LCS 240-376507/2-A
Matrix: Water
Analysis Batch: 376844

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 376507

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.06		mg/L		106	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-376507/1-A
Matrix: Water
Analysis Batch: 376859

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 376507

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1000	580	ug/L		04/15/19 14:00	04/16/19 15:54	1

Lab Sample ID: LCS 240-376507/3-A
Matrix: Water
Analysis Batch: 376859

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 376507

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	10000	9350		ug/L		93	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-454750/4
Matrix: Water
Analysis Batch: 454750

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Lab Sample ID: LCS 280-454808/4
Matrix: Water
Analysis Batch: 454808

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-454539/6
Matrix: Water
Analysis Batch: 454539

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			04/14/19 12:51	1
Fluoride	ND		0.50	0.060	mg/L			04/14/19 12:51	1
Sulfate	ND		5.0	1.0	mg/L			04/14/19 12:51	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: LCS 280-454539/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454539

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	102		mg/L		102	90 - 110
Fluoride	5.00	5.15		mg/L		103	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-454539/5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454539

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	102		mg/L		102	90 - 110	0	10
Fluoride	5.00	5.14		mg/L		103	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-454539/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454539

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.49	J	mg/L		99	50 - 150
Fluoride	0.200	0.198	J	mg/L		99	50 - 150
Sulfate	2.50	2.48	J	mg/L		99	50 - 150

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

Lab Sample ID: MB 280-454670/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454670

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	5.00	J	10	4.7	mg/L			04/15/19 20:54	1

Lab Sample ID: LCS 280-454670/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454670

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	502	499		mg/L		99	93 - 110

Lab Sample ID: MB 280-454819/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 454819

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	5.00	J	10	4.7	mg/L			04/16/19 16:32	1

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

Lab Sample ID: LCS 280-454819/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 454819

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	502	496		mg/L		99	93 - 110

Lab Sample ID: LCSD 280-454819/25 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 454819

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	504	498		mg/L		99	93 - 110	0	20

Lab Sample ID: MB 280-455163/1 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 455163

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			04/18/19 16:23	1

Lab Sample ID: LCS 280-455163/2 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 455163

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	502	479		mg/L		95	93 - 110

Metals

Prep Batch: 376507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total Recoverable	Water	3005A	
280-122328-2	MW-15	Total Recoverable	Water	3005A	
280-122328-3	MW-16	Total Recoverable	Water	3005A	
280-122328-4	MW-17	Total Recoverable	Water	3005A	
280-122328-5	MW-15EB	Total Recoverable	Water	3005A	
280-122328-6	MW-16D	Total Recoverable	Water	3005A	
280-122328-7	MW-13	Total Recoverable	Water	3005A	
MB 240-376507/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-376507/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-376507/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 376844

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total Recoverable	Water	6010C	376507
280-122328-2	MW-15	Total Recoverable	Water	6010C	376507
280-122328-3	MW-16	Total Recoverable	Water	6010C	376507
280-122328-4	MW-17	Total Recoverable	Water	6010C	376507
280-122328-5	MW-15EB	Total Recoverable	Water	6010C	376507
280-122328-6	MW-16D	Total Recoverable	Water	6010C	376507
280-122328-7	MW-13	Total Recoverable	Water	6010C	376507
MB 240-376507/1-A	Method Blank	Total Recoverable	Water	6010C	376507
LCS 240-376507/2-A	Lab Control Sample	Total Recoverable	Water	6010C	376507

Analysis Batch: 376859

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total Recoverable	Water	6020A	376507
280-122328-2	MW-15	Total Recoverable	Water	6020A	376507
280-122328-3	MW-16	Total Recoverable	Water	6020A	376507
280-122328-4	MW-17	Total Recoverable	Water	6020A	376507
280-122328-5	MW-15EB	Total Recoverable	Water	6020A	376507
280-122328-6	MW-16D	Total Recoverable	Water	6020A	376507
280-122328-7	MW-13	Total Recoverable	Water	6020A	376507
MB 240-376507/1-A	Method Blank	Total Recoverable	Water	6020A	376507
LCS 240-376507/3-A	Lab Control Sample	Total Recoverable	Water	6020A	376507

General Chemistry

Analysis Batch: 454539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total/NA	Water	9056A	
280-122328-1	MW-14	Total/NA	Water	9056A	
280-122328-2	MW-15	Total/NA	Water	9056A	
280-122328-2	MW-15	Total/NA	Water	9056A	
280-122328-3	MW-16	Total/NA	Water	9056A	
280-122328-3	MW-16	Total/NA	Water	9056A	
280-122328-4	MW-17	Total/NA	Water	9056A	
280-122328-4	MW-17	Total/NA	Water	9056A	
280-122328-5	MW-15EB	Total/NA	Water	9056A	
280-122328-6	MW-16D	Total/NA	Water	9056A	
280-122328-6	MW-16D	Total/NA	Water	9056A	
280-122328-7	MW-13	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 454539 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-7	MW-13	Total/NA	Water	9056A	
MB 280-454539/6	Method Blank	Total/NA	Water	9056A	
LCS 280-454539/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-454539/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-454539/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 454670

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-2	MW-15	Total/NA	Water	SM 2540C	
280-122328-3	MW-16	Total/NA	Water	SM 2540C	
280-122328-4	MW-17	Total/NA	Water	SM 2540C	
280-122328-6	MW-16D	Total/NA	Water	SM 2540C	
MB 280-454670/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-454670/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 454750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total/NA	Water	9040B	
280-122328-2	MW-15	Total/NA	Water	9040B	
280-122328-3	MW-16	Total/NA	Water	9040B	
280-122328-4	MW-17	Total/NA	Water	9040B	
280-122328-6	MW-16D	Total/NA	Water	9040B	
280-122328-7	MW-13	Total/NA	Water	9040B	
LCS 280-454750/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 454808

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-5	MW-15EB	Total/NA	Water	9040B	
LCS 280-454808/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 454819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-1	MW-14	Total/NA	Water	SM 2540C	
280-122328-7	MW-13	Total/NA	Water	SM 2540C	
MB 280-454819/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-454819/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-454819/25	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 455163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-122328-5	MW-15EB	Total/NA	Water	SM 2540C	
MB 280-455163/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-455163/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Lab Chronicle

Client: HDR Inc — Job ID: 280-122328-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 — Lab Sample ID: 280-122328-1

Date Collected: 04/10/19 11:45 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 11:40	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:22	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 16:39	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/14/19 21:37	JAP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	454539	04/14/19 21:55	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	454819	04/16/19 16:32	ARM	TAL DEN

Client Sample ID: MW-15 — Lab Sample ID: 280-122328-2

Date Collected: 04/09/19 11:10 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 11:44	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:25	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 16:49	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/14/19 22:14	JAP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	454539	04/14/19 22:33	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	454670	04/15/19 20:54	ARM	TAL DEN

Client Sample ID: MW-16 — Lab Sample ID: 280-122328-3

Date Collected: 04/09/19 12:45 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 11:48	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:27	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 17:00	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/14/19 22:52	JAP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	454539	04/14/19 23:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	454670	04/15/19 20:54	ARM	TAL DEN

Client Sample ID: MW-17 — Lab Sample ID: 280-122328-4

Date Collected: 04/09/19 14:00 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 11:53	WKD	TAL CAN

Client Sample ID: MW-17 — Lab Sample ID: 280-122328-4

Date Collected: 04/09/19 14:00 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:29	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 16:29	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/14/19 23:29	JAP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	454539	04/14/19 23:48	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	454670	04/15/19 20:54	ARM	TAL DEN

Client Sample ID: MW-15EB — Lab Sample ID: 280-122328-5

Date Collected: 04/09/19 11:30 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 11:57	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:32	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454808	04/16/19 14:13	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/15/19 00:06	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	455163	04/18/19 16:23	ARM	TAL DEN

Client Sample ID: MW-16D — Lab Sample ID: 280-122328-6

Date Collected: 04/09/19 12:45 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 13:02	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:34	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 16:45	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/15/19 01:03	JAP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	454539	04/15/19 01:21	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	454670	04/15/19 20:54	ARM	TAL DEN

Client Sample ID: MW-13 — Lab Sample ID: 280-122328-7

Date Collected: 04/10/19 10:57 — **Matrix: Water**

Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			376844	04/16/19 13:06	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	376507	04/15/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			376859	04/16/19 16:37	RKT	TAL CAN
Total/NA	Analysis	9040B		1			454750	04/12/19 16:34	SGB	TAL DEN

Lab Chronicle

Client: HDR Inc | Job ID: 280-122328-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-13 | **Lab Sample ID: 280-122328-7**
Date Collected: 04/10/19 10:57 | **Matrix: Water**
Date Received: 04/10/19 16:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	5 mL	5 mL	454539	04/15/19 01:40	JAP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	454539	04/15/19 01:59	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	454819	04/16/19 16:32	ARM	TAL DEN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-122328-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19 *
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

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

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

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Client Information	Sampler: Matt Rohr	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No:
Client Contact: Molly Reeves	Phone: 402-598-8470	E-Mail: darlene.bandy@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): 5			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #: DEN-018			
Email: molly.reeves@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 10025968			
Site: Colorado	SSOW#:			

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Dissolved Solids	pH, Fluoride, Chloride, Sulfate	App III - Total Metals	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
MW-14	4/10/19	1145	G	W	N		✓	✓	✓		
MW-15	4/9/19	1110	G	W	N		✓	✓	✓		
MW-16	4/9/19	1245	G	W	N		✓	✓	✓		
MW-17	4/9/19	1400	G	W	N		✓	✓	✓		
MW-15 EB	4/9/19	1130	G	W	N		✓	✓	✓		
MW-16 D	4/9/19	1245	G	W	N		✓	✓	✓		

280-122328 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 4/10/19 / 1622	Company: HDR	Received by: [signature]	Date/Time: 4.10.19 1622	Company: TA DEN
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.4 ± 0.0 IR9 AP 4-10-19

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information	Sampler: Matt Rohr	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No:
Client Contact: Molly Reeves	Phone: 402-598-8470	E-Mail: darlene.bandy@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc		Analysis Requested		Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): 5			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #: DEN-018			
Email: molly.reeves@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 10025968			
Site: Colorado	SSOW#:			

Preservation Codes:

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

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Dissolved Solids	pH, Fluoride, Chloride, Sulfate	App III - Total Metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-13	4/10/19	1057	G	W	N		✓	✓	✓		

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

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

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 4/10/2019 1622	Company: HDR	Received by: [signature]	Date/Time: 4.10.19 1622	Company: TADEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

1.2/C1,0

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-478658.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-122328-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 4/18/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A Boron	6020A/3005A (MOD) Total Metals App III Calcium	Total Number of containers	Special Instructions/Note:
			Preservation Code:							52
MW-14 (280-122328-1)	4/10/19	11:45 Mountain		Water			X	X	1	
MW-15 (280-122328-2)	4/9/19	11:10 Mountain		Water			X	X	1	
MW-16 (280-122328-3)	4/9/19	12:45 Mountain		Water			X	X	1	
MW-17 (280-122328-4)	4/9/19	14:00 Mountain		Water			X	X	1	
MW-15EB (280-122328-5)	4/9/19	11:30 Mountain		Water			X	X	1	
MW-16D (280-122328-6)	4/9/19	12:45 Mountain		Water			X	X	1	
MW-13 (280-122328-7)	4/10/19	10:57 Mountain		Water			X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: Laura Castro	Date/Time: 4-12-19 1105	Company: TALD	Received by:	Date/Time: 4/13/19 0945	Company: TA
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

TestAmerica Canton Sample Receipt Form/Narrative **Login # :** ______________
Canton Facility

Client JA Denver Site Name ______________ Cooler unpacked by:
Cooler Received on 4/13/19 Opened on 4/15/19
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ______________

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______________
Packing material used: Bubble Wrap Foam Plastic Bag None Other ______________
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.2** °C) Observed Cooler Temp. 1.2 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #36 (CF **+0.7**°C) Observed Cooler Temp.______ °C Corrected Cooler Temp.______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC984738**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____________ Yes No
16. Was a LL Hg or Me Hg trip blank present? ______________ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ______________ were received after the recommended holding time had expired.
Sample(s) ______________ were received in a broken container.
Sample(s) ______________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______________ were further preserved in the laboratory.
Time preserved: ____________ Preservative(s) added/Lot number(s): ______________

VOA Sample Preservation - Date/Time VOAs Frozen: ______________

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-122328-1

Login Number: 122328
List Number: 1
Creator: Turner, Shelby R

List Source: Eurofins TestAmerica, Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	N/A	
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	

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TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-123499-1

Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
6/7/2019 5:55:50 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

Definitions/Glossary

Client: HDR Inc
Job ID: 280-123499-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Qualifiers

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
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
*	LCS or LCSD is outside acceptance limits.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
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)
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)

Job ID: 280-123499-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-123499-1

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

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

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

RECEIPT

The samples were received on 5/7/2019 3:17 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.8º C.

TOTAL RECOVERABLE METALS

Samples MW-13 (280-123499-1), MW-14 (280-123499-2), MW-15 (280-123499-3), MW-16 (280-123499-4), MW-17 (280-123499-5), MW-15D (280-123499-6) and MW-15EB (280-123499-7) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/14/2019 and analyzed on 05/15/2019.

Boron was detected in method blank MB 240-381180/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

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

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-13 (280-123499-1), MW-14 (280-123499-2), MW-15 (280-123499-3), MW-16 (280-123499-4), MW-17 (280-123499-5), MW-15D (280-123499-6) and MW-15EB (280-123499-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/14/2019 and analyzed on 05/18/2019.

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

TOTAL DISSOLVED SOLIDS

Samples MW-13 (280-123499-1), MW-14 (280-123499-2), MW-15 (280-123499-3), MW-16 (280-123499-4), MW-17 (280-123499-5), MW-15D (280-123499-6) and MW-15EB (280-123499-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 05/22/2019.

Total Dissolved Solids (TDS) failed the recovery criteria low for LCS 280-458137/2. Refer to the QC report for details. The samples were reanalyzed out of hold on 5/22/2019, and the reanalysis results confirmed the original results. As requested by the client, the in hold results have been reported.

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

Job ID: 280-123499-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

CORROSIVITY (PH)

Samples MW-13 (280-123499-1), MW-14 (280-123499-2), MW-15 (280-123499-3), MW-16 (280-123499-4), MW-17 (280-123499-5), MW-15D (280-123499-6) and MW-15EB (280-123499-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 06/03/2019.

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

ANIONS (28 DAYS)

Samples MW-13 (280-123499-1), MW-14 (280-123499-2), MW-15 (280-123499-3), MW-16 (280-123499-4), MW-17 (280-123499-5), MW-15D (280-123499-6) and MW-15EB (280-123499-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 06/03/2019 and 06/04/2019.

Samples MW-14 (280-123499-2)[2X], MW-14 (280-123499-2)[20X], MW-15 (280-123499-3)[20X], MW-16 (280-123499-4)[20X], MW-17 (280-123499-5)[10X] and MW-15D (280-123499-6)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

Client Sample ID: MW-13
Lab Sample ID: 280-123499-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.50	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	110000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	150		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	180		5.0	1.0	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	880	*	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-14
Lab Sample ID: 280-123499-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.4	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	250000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	470		60	20	mg/L	20		9056A	Total/NA
Fluoride	3.0		1.0	0.12	mg/L	2		9056A	Total/NA
Sulfate	990		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2300	*	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-15
Lab Sample ID: 280-123499-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.8	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	230000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	420		60	20	mg/L	20		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	750		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2000	*	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16
Lab Sample ID: 280-123499-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.65	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	180000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	360		60	20	mg/L	20		9056A	Total/NA
Fluoride	2.6		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	720		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	1800	*	20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc
Job ID: 280-123499-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-17 — Lab Sample ID: 280-123499-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.67	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	120000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	170		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	410		50	10	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1000	*	20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-15D — Lab Sample ID: 280-123499-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.8	B	0.10	0.023	mg/L	1		6010C	Total Recoverable
Calcium	220000		1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	440		60	20	mg/L	20		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	820		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	1900	*	40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-15EB — Lab Sample ID: 280-123499-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	830	J	1000	580	ug/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	19.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Total Dissolved Solids (TDS)	16	*	10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN

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 CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Sample Summary

Client: HDR Inc	Job ID: 280-123499-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-123499-1	MW-13	Water	05/07/19 11:45	05/07/19 15:17	
280-123499-2	MW-14	Water	05/07/19 09:25	05/07/19 15:17	
280-123499-3	MW-15	Water	05/07/19 10:25	05/07/19 15:17	
280-123499-4	MW-16	Water	05/07/19 12:55	05/07/19 15:17	
280-123499-5	MW-17	Water	05/07/19 14:20	05/07/19 15:17	
280-123499-6	MW-15D	Water	05/07/19 10:30	05/07/19 15:17	
280-123499-7	MW-15EB	Water	05/07/19 10:40	05/07/19 15:17	

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-13
Date Collected: 05/07/19 11:45
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.50	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 17:36	1

Client Sample ID: MW-14
Date Collected: 05/07/19 09:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.4	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 17:41	1

Client Sample ID: MW-15
Date Collected: 05/07/19 10:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.8	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 17:46	1

Client Sample ID: MW-16
Date Collected: 05/07/19 12:55
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.65	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 17:50	1

Client Sample ID: MW-17
Date Collected: 05/07/19 14:20
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.67	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 17:55	1

Client Sample ID: MW-15D
Date Collected: 05/07/19 10:30
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.8	B	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 18:00	1

Client Sample ID: MW-15EB
Date Collected: 05/07/19 10:40
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		05/14/19 14:00	05/15/19 18:05	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-13
Date Collected: 05/07/19 11:45
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	110000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:01	1

Client Sample ID: MW-14
Date Collected: 05/07/19 09:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	250000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:03	1

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-123499-1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-15
Date Collected: 05/07/19 10:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	230000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:06	1

Client Sample ID: MW-16
Date Collected: 05/07/19 12:55
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	180000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:08	1

Client Sample ID: MW-17
Date Collected: 05/07/19 14:20
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	120000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:11	1

Client Sample ID: MW-15D
Date Collected: 05/07/19 10:30
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	220000		1000	580	ug/L		05/14/19 14:00	05/18/19 02:18	1

Client Sample ID: MW-15EB
Date Collected: 05/07/19 10:40
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	830	J	1000	580	ug/L		05/14/19 14:00	05/18/19 02:20	1

General Chemistry

Client Sample ID: MW-13
Date Collected: 05/07/19 11:45
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU			06/03/19 12:26	1
Temperature	19.2	HF	1.0	1.0	Degrees C			06/03/19 12:26	1
Chloride	150		3.0	1.0	mg/L			06/03/19 21:25	1
Fluoride	1.2		0.50	0.060	mg/L			06/03/19 21:25	1
Sulfate	180		5.0	1.0	mg/L			06/03/19 21:25	1
Total Dissolved Solids (TDS)	880	*	20	9.4	mg/L			05/14/19 12:25	1

Client Sample ID: MW-14
Date Collected: 05/07/19 09:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU			06/03/19 12:39	1
Temperature	20.4	HF	1.0	1.0	Degrees C			06/03/19 12:39	1
Chloride	470		60	20	mg/L			06/03/19 22:14	20
Fluoride	3.0		1.0	0.12	mg/L			06/03/19 21:58	2
Sulfate	990		100	21	mg/L			06/03/19 22:14	20
Total Dissolved Solids (TDS)	2300	*	40	19	mg/L			05/14/19 12:25	1

Client Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-123499-1

General Chemistry

Client Sample ID: MW-15
Date Collected: 05/07/19 10:25
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU			06/03/19 12:35	1
Temperature	19.3	HF	1.0	1.0	Degrees C			06/03/19 12:35	1
Chloride	420		60	20	mg/L			06/03/19 22:47	20
Fluoride	1.5		0.50	0.060	mg/L			06/03/19 22:31	1
Sulfate	750		100	21	mg/L			06/03/19 22:47	20
Total Dissolved Solids (TDS)	2000	*	20	9.4	mg/L			05/14/19 12:25	1

Client Sample ID: MW-16
Date Collected: 05/07/19 12:55
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			06/03/19 12:31	1
Temperature	19.7	HF	1.0	1.0	Degrees C			06/03/19 12:31	1
Chloride	360		60	20	mg/L			06/03/19 23:20	20
Fluoride	2.6		0.50	0.060	mg/L			06/03/19 23:03	1
Sulfate	720		100	21	mg/L			06/03/19 23:20	20
Total Dissolved Solids (TDS)	1800	*	20	9.4	mg/L			05/14/19 12:25	1

Client Sample ID: MW-17
Date Collected: 05/07/19 14:20
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			06/03/19 12:44	1
Temperature	20.3	HF	1.0	1.0	Degrees C			06/03/19 12:44	1
Chloride	170		3.0	1.0	mg/L			06/03/19 23:36	1
Fluoride	1.5		0.50	0.060	mg/L			06/03/19 23:36	1
Sulfate	410		50	10	mg/L			06/04/19 00:26	10
Total Dissolved Solids (TDS)	1000	*	20	9.4	mg/L			05/14/19 12:25	1

Client Sample ID: MW-15D
Date Collected: 05/07/19 10:30
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU			06/03/19 12:18	1
Temperature	19.6	HF	1.0	1.0	Degrees C			06/03/19 12:18	1
Chloride	440		60	20	mg/L			06/04/19 00:58	20
Fluoride	1.5		0.50	0.060	mg/L			06/04/19 00:42	1
Sulfate	820		100	21	mg/L			06/04/19 00:58	20
Total Dissolved Solids (TDS)	1900	*	40	19	mg/L			05/14/19 12:25	1

Client Sample ID: MW-15EB
Date Collected: 05/07/19 10:40
Date Received: 05/07/19 15:17

Lab Sample ID: 280-123499-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.4	HF	0.1	0.1	SU			06/03/19 12:48	1
Temperature	19.4	HF	1.0	1.0	Degrees C			06/03/19 12:48	1
Chloride	ND		3.0	1.0	mg/L			06/04/19 01:15	1
Fluoride	ND		0.50	0.060	mg/L			06/04/19 01:15	1
Sulfate	ND		5.0	1.0	mg/L			06/04/19 01:15	1
Total Dissolved Solids (TDS)	16	*	10	4.7	mg/L			05/14/19 12:25	1

QC Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-123499-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-381180/1-A
Matrix: Water
Analysis Batch: 381451

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 381180

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0764	J	0.10	0.023	mg/L		05/14/19 14:00	05/15/19 16:55	1

Lab Sample ID: LCS 240-381180/2-A
Matrix: Water
Analysis Batch: 381451

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 381180

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.15		mg/L		115	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-381180/1-A
Matrix: Water
Analysis Batch: 381976

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 381180

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Calcium	ND		1000	580	ug/L		05/14/19 14:00	05/18/19 01:24	1

Lab Sample ID: LCS 240-381180/3-A
Matrix: Water
Analysis Batch: 381976

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 381180

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Calcium	25000	24400		ug/L		98	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-460287/4
Matrix: Water
Analysis Batch: 460287

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 280-123499-6 DU
Matrix: Water
Analysis Batch: 460287

Client Sample ID: MW-15D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.9	HF	8.0		SU		0.8	5
Temperature	19.6	HF	19.0		Degrees C		3	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-460230/6
Matrix: Water
Analysis Batch: 460230

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			06/03/19 11:19	1
Fluoride	ND		0.50	0.060	mg/L			06/03/19 11:19	1

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

Lab Sample ID: MB 280-460230/6
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460230

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	1.0	mg/L			06/03/19 11:19	1

Lab Sample ID: LCS 280-460230/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460230

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.4		mg/L		99	90 - 110
Fluoride	5.00	5.10		mg/L		102	90 - 110
Sulfate	100	98.4		mg/L		98	90 - 110

Lab Sample ID: LCSD 280-460230/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460230

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.8		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.17		mg/L		103	90 - 110	1	10
Sulfate	100	98.6		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-460230/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460230

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.45	J	mg/L		98	50 - 150
Fluoride	0.200	0.224	J	mg/L		112	50 - 150
Sulfate	2.50	2.08	J	mg/L		83	50 - 150

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

Lab Sample ID: MB 280-458137/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 458137

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			05/14/19 12:25	1

Lab Sample ID: LCS 280-458137/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 458137

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	446	*	mg/L		89	93 - 110

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

Lab Sample ID: 280-123499-1 DU | **Client Sample ID: MW-13**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 458137

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids (TDS)	880	*		864	*	mg/L				1	10

Metals

Prep Batch: 381180

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total Recoverable	Water	3005A	
280-123499-2	MW-14	Total Recoverable	Water	3005A	
280-123499-3	MW-15	Total Recoverable	Water	3005A	
280-123499-4	MW-16	Total Recoverable	Water	3005A	
280-123499-5	MW-17	Total Recoverable	Water	3005A	
280-123499-6	MW-15D	Total Recoverable	Water	3005A	
280-123499-7	MW-15EB	Total Recoverable	Water	3005A	
MB 240-381180/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-381180/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-381180/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 381451

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total Recoverable	Water	6010C	381180
280-123499-2	MW-14	Total Recoverable	Water	6010C	381180
280-123499-3	MW-15	Total Recoverable	Water	6010C	381180
280-123499-4	MW-16	Total Recoverable	Water	6010C	381180
280-123499-5	MW-17	Total Recoverable	Water	6010C	381180
280-123499-6	MW-15D	Total Recoverable	Water	6010C	381180
280-123499-7	MW-15EB	Total Recoverable	Water	6010C	381180
MB 240-381180/1-A	Method Blank	Total Recoverable	Water	6010C	381180
LCS 240-381180/2-A	Lab Control Sample	Total Recoverable	Water	6010C	381180

Analysis Batch: 381976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total Recoverable	Water	6020A	381180
280-123499-2	MW-14	Total Recoverable	Water	6020A	381180
280-123499-3	MW-15	Total Recoverable	Water	6020A	381180
280-123499-4	MW-16	Total Recoverable	Water	6020A	381180
280-123499-5	MW-17	Total Recoverable	Water	6020A	381180
280-123499-6	MW-15D	Total Recoverable	Water	6020A	381180
280-123499-7	MW-15EB	Total Recoverable	Water	6020A	381180
MB 240-381180/1-A	Method Blank	Total Recoverable	Water	6020A	381180
LCS 240-381180/3-A	Lab Control Sample	Total Recoverable	Water	6020A	381180

General Chemistry

Analysis Batch: 458137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total/NA	Water	SM 2540C	
280-123499-2	MW-14	Total/NA	Water	SM 2540C	
280-123499-3	MW-15	Total/NA	Water	SM 2540C	
280-123499-4	MW-16	Total/NA	Water	SM 2540C	
280-123499-5	MW-17	Total/NA	Water	SM 2540C	
280-123499-6	MW-15D	Total/NA	Water	SM 2540C	
280-123499-7	MW-15EB	Total/NA	Water	SM 2540C	
MB 280-458137/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-458137/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-123499-1 DU	MW-13	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 460230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total/NA	Water	9056A	
280-123499-2	MW-14	Total/NA	Water	9056A	
280-123499-2	MW-14	Total/NA	Water	9056A	
280-123499-3	MW-15	Total/NA	Water	9056A	
280-123499-3	MW-15	Total/NA	Water	9056A	
280-123499-4	MW-16	Total/NA	Water	9056A	
280-123499-4	MW-16	Total/NA	Water	9056A	
280-123499-5	MW-17	Total/NA	Water	9056A	
280-123499-5	MW-17	Total/NA	Water	9056A	
280-123499-6	MW-15D	Total/NA	Water	9056A	
280-123499-6	MW-15D	Total/NA	Water	9056A	
280-123499-7	MW-15EB	Total/NA	Water	9056A	
MB 280-460230/6	Method Blank	Total/NA	Water	9056A	
LCS 280-460230/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-460230/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-460230/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 460287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-123499-1	MW-13	Total/NA	Water	9040B	
280-123499-2	MW-14	Total/NA	Water	9040B	
280-123499-3	MW-15	Total/NA	Water	9040B	
280-123499-4	MW-16	Total/NA	Water	9040B	
280-123499-5	MW-17	Total/NA	Water	9040B	
280-123499-6	MW-15D	Total/NA	Water	9040B	
280-123499-7	MW-15EB	Total/NA	Water	9040B	
LCS 280-460287/4	Lab Control Sample	Total/NA	Water	9040B	
280-123499-6 DU	MW-15D	Total/NA	Water	9040B	

Lab Chronicle

Client: HDR Inc
Job ID: 280-123499-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-13
Lab Sample ID: 280-123499-1
Date Collected: 05/07/19 11:45
Matrix: Water
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 17:36	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:01	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:26	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/03/19 21:25	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-14
Lab Sample ID: 280-123499-2
Date Collected: 05/07/19 09:25
Matrix: Water
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 17:41	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:03	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:39	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	460230	06/03/19 21:58	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	460230	06/03/19 22:14	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-15
Lab Sample ID: 280-123499-3
Date Collected: 05/07/19 10:25
Matrix: Water
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 17:46	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:06	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:35	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/03/19 22:31	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	460230	06/03/19 22:47	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-16
Lab Sample ID: 280-123499-4
Date Collected: 05/07/19 12:55
Matrix: Water
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 17:50	WKD	TAL CAN

Client Sample ID: MW-16 — Lab Sample ID: 280-123499-4

Date Collected: 05/07/19 12:55 — **Matrix: Water**
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:08	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:31	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/03/19 23:03	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	460230	06/03/19 23:20	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-17 — Lab Sample ID: 280-123499-5

Date Collected: 05/07/19 14:20 — **Matrix: Water**
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 17:55	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:11	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:44	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/03/19 23:36	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	460230	06/04/19 00:26	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-15D — Lab Sample ID: 280-123499-6

Date Collected: 05/07/19 10:30 — **Matrix: Water**
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 18:00	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:18	DSH	TAL CAN
Total/NA	Analysis	9040B		1			460287	06/03/19 12:18	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/04/19 00:42	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	460230	06/04/19 00:58	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Client Sample ID: MW-15EB — Lab Sample ID: 280-123499-7

Date Collected: 05/07/19 10:40 — **Matrix: Water**
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			381451	05/15/19 18:05	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	381180	05/14/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			381976	05/18/19 02:20	DSH	TAL CAN

Lab Chronicle

Client Sample ID: MW-15EB
Lab Sample ID: 280-123499-7
Date Collected: 05/07/19 10:40
Matrix: Water
Date Received: 05/07/19 15:17

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9040B		1			460287	06/03/19 12:48	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	460230	06/04/19 01:15	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	458137	05/14/19 12:25	MJS	TAL DEN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-123499-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19 *
Illinois	NELAP	5	200004	07-31-19 *
Iowa	State Program	7	421	06-01-21
Kansas	NELAP	7	E-10336	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19 *
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19 *
New York	NELAP	2	10975	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19 *
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19 *
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

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

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

Denver
#280

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information
Client Contact: Molly Reeves
Company: HDR Inc
Address: 9781 S. Meridian Blvd Suite 400
City: Englewood
State, Zip: CO, 80112
Phone: 734-263-7138(Tel)
Email: anna.lundin@hdrinc.com
Project Name: Xcel Energy GW CCR Monitoring - Cherokee
Site: Colorado

Sampler: Emily Munoz
Phone: (720) 273-3136
Due Date Requested:
TAT Requested (days):
PO #:
WO #:
Project #: 28014371
SSOW#:

Lab PM: Bandy, Darlene F
E-Mail: darlene.bandy@testamericainc.com
Carrier Tracking No(s):
COC No:
Page: Page 1 of 1
Job #:

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	TDS	~~TSS~~	pH, Fluoride, Chloride, Sulfate	~~Ra226/Ra228 Combined~~	App III - Total Metals - Calcium, Boron	~~App IV - Total Metals (see list)~~	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	D	D		
MW-13	05/07/19	1145	G	Water	N	N	1		1		1		3	App III Analyses Only
MW-14	05/07/19	0925	G	Water	N	N	1		1		1		3	
MW-15	05/07/19	1025	G	Water	N	N	1		1		1		3	
MW-16	05/07/19	1255	G	Water	N	N	1		1		1		3	
MW-17	05/07/19	1420	G	W	N	N	1		1		1		3	
MW-15D	05/07/19	1030	G	W	N	N	1		1		1		3	
MW-15EB	05/07/19	1040	G	W	N	N	1		1		1		3	

EM 5/7/19

280-123499 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown ☐ Radiological
Deliverable Requested: I, II, III, IV, Other (specify)

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:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	05/07/19 1517	HDR	[signature]	5-7-19 1517	TA DEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks: 4.8, to, IR #9 by AP 5/7/19

Ver: 08/04/2016

1.2|C|.0

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-482646.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-123499-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 6/3/2019	Analysis Requested		Preservation Codes:
City: North Canton	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
State, Zip: OH, 44720				M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			Other:
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			S45

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A Boron	6020A/3005A Calcium	Total Number of containers	Special Instructions/Note:
				Preservation Code:						
MW-13 (280-123499-1)	5/7/19	11:45 Mountain		Water			X	X	1	
MW-14 (280-123499-2)	5/7/19	09:25 Mountain		Water			X	X	1	
MW-15 (280-123499-3)	5/7/19	10:25 Mountain		Water			X	X	1	
MW-16 (280-123499-4)	5/7/19	12:55 Mountain		Water			X	X	1	
MW-17 (280-123499-5)	5/7/19	14:20 Mountain		Water			X	X	1	
MW-15D (280-123499-6)	5/7/19	10:30 Mountain		Water			X	X	1	
MW-15EB (280-123499-7)	5/7/19	10:40 Mountain		Water			X	X	1	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: [signature]	Date/Time: 5/10/19 1700	Company: TA Cuy	Received by: [signature]	Date/Time: 5/11/19 1010	Company: TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client TA Denver Site Name ______ Cooler unpacked by:

Cooler Received on 5/11/19 Opened on 5/13/19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ______

Receipt After-hours: Drop-off Date/Time ______ Storage Location ______

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______

Packing material used: Bubble Wrap Foam Plastic Bag None Other ______

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **-0.2** °C) Observed Cooler Temp. 1.2 °C Corrected Cooler Temp. 1.0 °C
   IR GUN #36 (CF +0.7°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC984738**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #______ Yes No
16. Was a LL Hg or Me Hg trip blank present? ______ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ______ Date ______ by ______ via Verbal Voice Mail Other

Concerning ______

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ______ were received after the recommended holding time had expired.
Sample(s) ______ were received in a broken container.
Sample(s) ______ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______ were further preserved in the laboratory.
Time preserved: ______ Preservative(s) added/Lot number(s): ______

VOA Sample Preservation - Date/Time VOAs Frozen: ______

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc   Job Number: 280-123499-1

Login Number: 123499   **List Source: Eurofins TestAmerica, Denver**
List Number: 1
Creator: Paul, Amanda E

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

eurofins

Environment Testing
TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-124614-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Authorized for release by:
8/15/2019 9:38:50 AM

Stephanie Rothmeyer, Project Manager I
(303)736-0182
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Designee for

Darlene Bandy, Project Manager I
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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Table of Contents

Definitions/Glossary

Qualifiers

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.

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)

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Job ID: 280-124614-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-124614-1

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

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

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

This report may include data with reporting limits (RLs) less than TestAmerica's standard reporting limit. These data and reporting limits are being used specifically to meet the needs of this project. Note that data are not customarily reported to these levels without qualifiers, because they are inherently less reliable and potentially less defensible than the latest industry standards require.

RECEIPT
The samples were received on 6/4/2019 at 11:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.9º C and 1.6º C.

TOTAL RECOVERABLE METALS (ICPMS)
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/06/2019 and analyzed on 06/07/2019.

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

TOTAL MERCURY
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 06/06/2019 and analyzed on 06/10/2019.

Mercury failed the recovery criteria low for the MSD of sample 240-113715-2 in batch 240-385400. Refer to the QC report for details.

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

TOTAL SUSPENDED SOLIDS
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 06/05/2019.

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

ANIONS (28 DAYS)
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 06/10/2019.

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

Job ID: 280-124614-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

RADIUM-226 (GFPC)
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/12/2019 and analyzed on 08/14/2019.

Radium-226 exceeded the RPD limit for the duplicate of sample 400-170707-18. Refer to the QC report for details.

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.

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

RADIUM-228
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/13/2019 and analyzed on 07/22/2019.

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.

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

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-14 (280-124614-1), MW-13 (280-124614-5) and MW-13EB (280-124614-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 08/15/2019.

Combined Radium 226 + 228 exceeded the RPD limit for the duplicate of sample 400-170707-18. Refer to the QC report for details.

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

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Client Sample ID: MW-14 Lab Sample ID: 280-124614-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00089	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0029	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.11		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.0014		0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00048	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0022		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.017		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.028		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.0038		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0080		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00054	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Lithium	0.086		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	2.2		0.050	0.024	mg/L	1		9056A	Total/NA
Total Suspended Solids	18		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-13 Lab Sample ID: 280-124614-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.068		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00056	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0027	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0017	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.033		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	1.1		0.050	0.024	mg/L	1		9056A	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-13EB Lab Sample ID: 280-124614-6

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-124614-1	MW-14	Water	06/04/19 09:15	06/04/19 11:00	
280-124614-5	MW-13	Water	06/03/19 11:35	06/04/19 11:00	
280-124614-6	MW-13EB	Water	06/03/19 12:00	06/04/19 11:00	

Client: HDR Inc | Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-14 | **Lab Sample ID: 280-124614-1**
Date Collected: 06/04/19 09:15 | **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00089	J	0.0020	0.00057	mg/L		06/06/19 14:00	06/07/19 13:55	1
Arsenic	0.0029	J	0.0050	0.00075	mg/L		06/06/19 14:00	06/07/19 13:55	1
Barium	0.11		0.0050	0.0022	mg/L		06/06/19 14:00	06/07/19 13:55	1
Beryllium	0.0014		0.0010	0.00031	mg/L		06/06/19 14:00	06/07/19 13:55	1
Cadmium	0.00048	J	0.0010	0.00021	mg/L		06/06/19 14:00	06/07/19 13:55	1
Cobalt	0.0022		0.0010	0.00019	mg/L		06/06/19 14:00	06/07/19 13:55	1
Chromium	0.017		0.0020	0.00098	mg/L		06/06/19 14:00	06/07/19 13:55	1
Molybdenum	0.028		0.010	0.0011	mg/L		06/06/19 14:00	06/07/19 13:55	1
Lead	0.0038		0.0010	0.00045	mg/L		06/06/19 14:00	06/07/19 13:55	1
Selenium	0.0080		0.0050	0.00089	mg/L		06/06/19 14:00	06/07/19 13:55	1
Thallium	0.00054	J	0.0010	0.00020	mg/L		06/06/19 14:00	06/07/19 13:55	1
Lithium	0.086		0.0080	0.0017	mg/L		06/06/19 14:00	06/07/19 13:55	1

Client Sample ID: MW-13 | **Lab Sample ID: 280-124614-5**
Date Collected: 06/03/19 11:35 | **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/06/19 14:00	06/07/19 14:08	1
Arsenic	ND		0.0050	0.00075	mg/L		06/06/19 14:00	06/07/19 14:08	1
Barium	0.068		0.0050	0.0022	mg/L		06/06/19 14:00	06/07/19 14:08	1
Beryllium	ND		0.0010	0.00031	mg/L		06/06/19 14:00	06/07/19 14:08	1
Cadmium	ND		0.0010	0.00021	mg/L		06/06/19 14:00	06/07/19 14:08	1
Cobalt	0.00056	J	0.0010	0.00019	mg/L		06/06/19 14:00	06/07/19 14:08	1
Chromium	ND		0.0020	0.00098	mg/L		06/06/19 14:00	06/07/19 14:08	1
Molybdenum	0.0027	J	0.010	0.0011	mg/L		06/06/19 14:00	06/07/19 14:08	1
Lead	ND		0.0010	0.00045	mg/L		06/06/19 14:00	06/07/19 14:08	1
Selenium	0.0017	J	0.0050	0.00089	mg/L		06/06/19 14:00	06/07/19 14:08	1
Thallium	ND		0.0010	0.00020	mg/L		06/06/19 14:00	06/07/19 14:08	1
Lithium	0.033		0.0080	0.0017	mg/L		06/06/19 14:00	06/07/19 14:08	1

Client Sample ID: MW-13EB | **Lab Sample ID: 280-124614-6**
Date Collected: 06/03/19 12:00 | **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/06/19 14:00	06/07/19 14:10	1
Arsenic	ND		0.0050	0.00075	mg/L		06/06/19 14:00	06/07/19 14:10	1
Barium	ND		0.0050	0.0022	mg/L		06/06/19 14:00	06/07/19 14:10	1
Beryllium	ND		0.0010	0.00031	mg/L		06/06/19 14:00	06/07/19 14:10	1
Cadmium	ND		0.0010	0.00021	mg/L		06/06/19 14:00	06/07/19 14:10	1
Cobalt	ND		0.0010	0.00019	mg/L		06/06/19 14:00	06/07/19 14:10	1
Chromium	ND		0.0020	0.00098	mg/L		06/06/19 14:00	06/07/19 14:10	1
Molybdenum	ND		0.010	0.0011	mg/L		06/06/19 14:00	06/07/19 14:10	1
Lead	ND		0.0010	0.00045	mg/L		06/06/19 14:00	06/07/19 14:10	1
Selenium	ND		0.0050	0.00089	mg/L		06/06/19 14:00	06/07/19 14:10	1
Thallium	ND		0.0010	0.00020	mg/L		06/06/19 14:00	06/07/19 14:10	1
Lithium	ND		0.0080	0.0017	mg/L		06/06/19 14:00	06/07/19 14:10	1

Client: HDR Inc	Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14 — **Lab Sample ID: 280-124614-1**
Date Collected: 06/04/19 09:15 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/06/19 12:00	06/10/19 14:44	1

Client Sample ID: MW-13 — **Lab Sample ID: 280-124614-5**
Date Collected: 06/03/19 11:35 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/06/19 12:00	06/10/19 14:46	1

Client Sample ID: MW-13EB — **Lab Sample ID: 280-124614-6**
Date Collected: 06/03/19 12:00 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/06/19 12:00	06/10/19 14:48	1

General Chemistry

Client Sample ID: MW-14 — **Lab Sample ID: 280-124614-1**
Date Collected: 06/04/19 09:15 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.2**		0.050	0.024	mg/L			06/10/19 01:21	1
Total Suspended Solids	**18**		4.0	1.1	mg/L			06/05/19 10:09	1

Client Sample ID: MW-13 — **Lab Sample ID: 280-124614-5**
Date Collected: 06/03/19 11:35 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**		0.050	0.024	mg/L			06/10/19 04:48	1
Total Suspended Solids	**1.6**	**J**	4.0	1.1	mg/L			06/05/19 10:09	1

Client Sample ID: MW-13EB — **Lab Sample ID: 280-124614-6**
Date Collected: 06/03/19 12:00 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.050	0.024	mg/L			06/10/19 05:29	1
Total Suspended Solids	ND		4.0	1.1	mg/L			06/05/19 10:09	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14 — **Lab Sample ID: 280-124614-1**
Date Collected: 06/04/19 09:15 — **Matrix: Water**
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0962	U	0.0708	0.0713	1.00	0.100	pCi/L	06/12/19 14:18	08/14/19 19:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.7*		*40 - 110*	*06/12/19 14:18*	*08/14/19 19:27*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-13
Lab Sample ID: 280-124614-5
Date Collected: 06/03/19 11:35
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.154**		0.0976	0.0986	1.00	0.140	pCi/L	06/12/19 14:18	08/14/19 19:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.1*		*40 - 110*	*06/12/19 14:18*	*08/14/19 19:28*	*1*

Client Sample ID: MW-13EB
Lab Sample ID: 280-124614-6
Date Collected: 06/03/19 12:00
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0675	U	0.0367	0.0372	1.00	0.109	pCi/L	06/12/19 14:18	08/14/19 19:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.7*		*40 - 110*	*06/12/19 14:18*	*08/14/19 19:28*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Lab Sample ID: 280-124614-1
Date Collected: 06/04/19 09:15
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0550	U	0.314	0.314	1.00	0.578	pCi/L	06/13/19 11:01	07/22/19 12:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*82.7*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:46*	*1*
Y Carrier	*64.3*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:46*	*1*

Client Sample ID: MW-13
Lab Sample ID: 280-124614-5
Date Collected: 06/03/19 11:35
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.108	U	0.328	0.328	1.00	0.566	pCi/L	06/13/19 11:01	07/22/19 12:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.1*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:46*	*1*
Y Carrier	*79.3*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:46*	*1*

Client Sample ID: MW-13EB
Lab Sample ID: 280-124614-6
Date Collected: 06/03/19 12:00
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.463**		0.287	0.290	1.00	0.438	pCi/L	06/13/19 11:01	07/22/19 12:53	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.7*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:53*	*1*
Y Carrier	*79.3*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:53*	*1*

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

Client Sample ID: MW-14
Lab Sample ID: 280-124614-1
Date Collected: 06/04/19 09:15
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0413	U	0.322	0.322	5.00	0.578	pCi/L		08/15/19 08:21	1

Client Sample ID: MW-13
Lab Sample ID: 280-124614-5
Date Collected: 06/03/19 11:35
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.262	U	0.342	0.342	5.00	0.566	pCi/L		08/15/19 08:21	1

Client Sample ID: MW-13EB
Lab Sample ID: 280-124614-6
Date Collected: 06/03/19 12:00
Matrix: Water
Date Received: 06/04/19 11:00

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.395	U	0.289	0.292	5.00	0.438	pCi/L		08/15/19 08:21	1

QC Sample Results

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-384876/1-A
Matrix: Water
Analysis Batch: 385102

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 384876

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/06/19 14:00	06/07/19 13:39	1
Arsenic	ND		0.0050	0.00075	mg/L		06/06/19 14:00	06/07/19 13:39	1
Barium	ND		0.0050	0.0022	mg/L		06/06/19 14:00	06/07/19 13:39	1
Beryllium	ND		0.0010	0.00031	mg/L		06/06/19 14:00	06/07/19 13:39	1
Cadmium	ND		0.0010	0.00021	mg/L		06/06/19 14:00	06/07/19 13:39	1
Cobalt	ND		0.0010	0.00019	mg/L		06/06/19 14:00	06/07/19 13:39	1
Chromium	ND		0.0020	0.00098	mg/L		06/06/19 14:00	06/07/19 13:39	1
Molybdenum	ND		0.010	0.0011	mg/L		06/06/19 14:00	06/07/19 13:39	1
Lead	ND		0.0010	0.00045	mg/L		06/06/19 14:00	06/07/19 13:39	1
Selenium	ND		0.0050	0.00089	mg/L		06/06/19 14:00	06/07/19 13:39	1
Thallium	ND		0.0010	0.00020	mg/L		06/06/19 14:00	06/07/19 13:39	1
Lithium	ND		0.0080	0.0017	mg/L		06/06/19 14:00	06/07/19 13:39	1

Lab Sample ID: LCS 240-384876/3-A
Matrix: Water
Analysis Batch: 385102

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 384876

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.101		mg/L		101	80 - 120
Arsenic	1.00	0.960		mg/L		96	80 - 120
Barium	1.00	0.987		mg/L		99	80 - 120
Beryllium	0.500	0.482		mg/L		96	80 - 120
Cadmium	0.500	0.508		mg/L		102	80 - 120
Cobalt	0.500	0.486		mg/L		97	80 - 120
Chromium	0.500	0.481		mg/L		96	80 - 120
Molybdenum	0.500	0.504		mg/L		101	80 - 120
Lead	0.500	0.504		mg/L		101	80 - 120
Selenium	1.00	0.913		mg/L		91	80 - 120
Thallium	1.00	0.981		mg/L		98	80 - 120
Lithium	0.500	0.482		mg/L		96	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-384864/1-A
Matrix: Water
Analysis Batch: 385400

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 384864

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/06/19 12:00	06/10/19 13:35	1

Lab Sample ID: LCS 240-384864/2-A
Matrix: Water
Analysis Batch: 385400

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 384864

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.92		ug/L		98	80 - 120

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 240-385235/3
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 385235

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.050	0.024	mg/L			06/09/19 15:00	1

Lab Sample ID: LCS 240-385235/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 385235

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.50	2.53		mg/L		101	90 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-460549/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460549

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			06/05/19 10:09	1

Lab Sample ID: LCS 280-460549/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 460549

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	79.6		mg/L		80	79 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-431495/23-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 439521
Prep Batch: 431495

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.009378	U	0.0712	0.0713	1.00	0.137	pCi/L	06/12/19 14:18	08/14/19 19:28	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.5*		*40 - 110*	*06/12/19 14:18*	*08/14/19 19:28*	*1*

Lab Sample ID: LCS 160-431495/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 439521
Prep Batch: 431495

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	9.356		0.966	1.00	0.0860	pCi/L	82	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*99.9*		*40 - 110*

Client: HDR Inc | Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-431600/23-A | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 435773 | **Prep Batch: 431600**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2901	U	0.374	0.375	1.00	0.622	pCi/L	06/13/19 11:01	07/22/19 12:54	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.5*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:54*	*1*
Y Carrier	*68.0*		*40 - 110*	*06/13/19 11:01*	*07/22/19 12:54*	*1*

Lab Sample ID: LCS 160-431600/1-A | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 435771 | **Prep Batch: 431600**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.00	10.88		1.33	1.00	0.594	pCi/L	121	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*99.9*		*40 - 110*
Y Carrier	*59.8*		*40 - 110*

Metals

Prep Batch: 384864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	7470A	
280-124614-5	MW-13	Total/NA	Water	7470A	
280-124614-6	MW-13EB	Total/NA	Water	7470A	
MB 240-384864/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-384864/2-A	Lab Control Sample	Total/NA	Water	7470A	

Prep Batch: 384876

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total Recoverable	Water	3005A	
280-124614-5	MW-13	Total Recoverable	Water	3005A	
280-124614-6	MW-13EB	Total Recoverable	Water	3005A	
MB 240-384876/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-384876/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 385102

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total Recoverable	Water	6020A	384876
280-124614-5	MW-13	Total Recoverable	Water	6020A	384876
280-124614-6	MW-13EB	Total Recoverable	Water	6020A	384876
MB 240-384876/1-A	Method Blank	Total Recoverable	Water	6020A	384876
LCS 240-384876/3-A	Lab Control Sample	Total Recoverable	Water	6020A	384876

Analysis Batch: 385400

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	7470A	384864
280-124614-5	MW-13	Total/NA	Water	7470A	384864
280-124614-6	MW-13EB	Total/NA	Water	7470A	384864
MB 240-384864/1-A	Method Blank	Total/NA	Water	7470A	384864
LCS 240-384864/2-A	Lab Control Sample	Total/NA	Water	7470A	384864

General Chemistry

Analysis Batch: 385235

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	9056A	
280-124614-5	MW-13	Total/NA	Water	9056A	
280-124614-6	MW-13EB	Total/NA	Water	9056A	
MB 240-385235/3	Method Blank	Total/NA	Water	9056A	
LCS 240-385235/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 460549

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	SM 2540D	
280-124614-5	MW-13	Total/NA	Water	SM 2540D	
280-124614-6	MW-13EB	Total/NA	Water	SM 2540D	
MB 280-460549/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-460549/2	Lab Control Sample	Total/NA	Water	SM 2540D	

QC Association Summary

Rad

Prep Batch: 431495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	PrecSep-21	
280-124614-5	MW-13	Total/NA	Water	PrecSep-21	
280-124614-6	MW-13EB	Total/NA	Water	PrecSep-21	
MB 160-431495/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431495/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 431600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124614-1	MW-14	Total/NA	Water	PrecSep_0	
280-124614-5	MW-13	Total/NA	Water	PrecSep_0	
280-124614-6	MW-13EB	Total/NA	Water	PrecSep_0	
MB 160-431600/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431600/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14
Lab Sample ID: 280-124614-1

Date Collected: 06/04/19 09:15
Matrix: Water
Date Received: 06/04/19 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	384876	06/06/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			385102	06/07/19 13:55	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	384864	06/06/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385400	06/10/19 14:44	AJC	TAL CAN
Total/NA	Analysis	9056A		1			385235	06/10/19 01:21	JWW	TAL CAN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	460549	06/05/19 10:09	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.08 mL	1.0 g	431495	06/12/19 14:18	ORM	TAL SL
Total/NA	Analysis	9315		1			439521	08/14/19 19:27	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.08 mL	1.0 g	431600	06/13/19 11:01	ORM	TAL SL
Total/NA	Analysis	9320		1			435762	07/22/19 12:46	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			439602	08/15/19 08:21	SMP	TAL SL

Client Sample ID: MW-13
Lab Sample ID: 280-124614-5

Date Collected: 06/03/19 11:35
Matrix: Water
Date Received: 06/04/19 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	384876	06/06/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			385102	06/07/19 14:08	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	384864	06/06/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385400	06/10/19 14:46	AJC	TAL CAN
Total/NA	Analysis	9056A		1			385235	06/10/19 04:48	JWW	TAL CAN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	460549	06/05/19 10:09	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.65 mL	1.0 g	431495	06/12/19 14:18	ORM	TAL SL
Total/NA	Analysis	9315		1			439521	08/14/19 19:28	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.65 mL	1.0 g	431600	06/13/19 11:01	ORM	TAL SL
Total/NA	Analysis	9320		1			435762	07/22/19 12:46	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			439602	08/15/19 08:21	SMP	TAL SL

Client Sample ID: MW-13EB
Lab Sample ID: 280-124614-6

Date Collected: 06/03/19 12:00
Matrix: Water
Date Received: 06/04/19 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	384876	06/06/19 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			385102	06/07/19 14:10	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	384864	06/06/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385400	06/10/19 14:48	AJC	TAL CAN
Total/NA	Analysis	9056A		1			385235	06/10/19 05:29	JWW	TAL CAN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	460549	06/05/19 10:09	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.51 mL	1.0 g	431495	06/12/19 14:18	ORM	TAL SL
Total/NA	Analysis	9315		1			439521	08/14/19 19:28	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.51 mL	1.0 g	431600	06/13/19 11:01	ORM	TAL SL
Total/NA	Analysis	9320		1			435773	07/22/19 12:53	CDR	TAL SL

Client Sample ID: MW-13EB **Lab Sample ID: 280-124614-6**
Date Collected: 06/03/19 12:00 **Matrix: Water**
Date Received: 06/04/19 11:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			439602	08/15/19 08:21	SMP	TAL SL

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State		2927	02-23-20
California	State Program	9	2927	02-23-20
Connecticut	State		PH-0590	12-31-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-20
Georgia	State		4062	02-23-20
Georgia	State Program	4	N/A	02-23-20
Illinois	NELAP	5	200004	07-31-20
Iowa	State Program	7	421	06-01-21
Kansas	NELAP	7	E-10336	04-30-20
Kansas	NELAP		E-10336	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State		KY98016	12-31-19
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota	NELAP		OH00048	12-31-19
Minnesota (Petrofund)	State Program	1	3506	07-31-21
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-20
New York	NELAP	2	10975	03-31-20
New York	NELAP		10975	03-31-20
Ohio VAP	State		CL0024	06-05-21
Ohio VAP	State Program	5	CL0024	06-05-21
Oregon	NELAP	10	4062	02-23-20
Oregon	NELAP		4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Pennsylvania	NELAP		68-00340	08-31-19
Texas	NELAP	6	T104704517-19-11	08-31-20
Texas	NELAP		T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19 *
Virginia	NELAP		010101	09-14-19
Washington	State		C971	01-12-20
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State		210	12-31-19
West Virginia DEP	State Program	3	210	12-31-19

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State		2886	06-30-20
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Hawaii	State Program	9	NA	06-30-20
Illinois	NELAP	5	200023	11-30-19
Illinois	NELAP		004553	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State		KY90125	12-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Louisiana (DW)	State		LA011	12-31-19
Maryland	State		310	09-30-20
Maryland	State Program	3	310	09-30-20
Michigan	State Program	5	9005	06-30-20
Missouri	State		780	06-30-22
Missouri	State Program	7	780	06-30-20
New Jersey	NELAP	2	MO002	06-30-20
New Jersey	NELAP		MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-20
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-20
Texas	NELAP	6	T104704193-19-14	07-31-20
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-20
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542019-11	07-31-20
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19 *

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

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Denver #280

Chain of Custody Record

Job 280-124614-1

TestAmerica THE LEADER IN ENVIRONMENTAL TESTING

Client Information	Sampler: Austin Morgan	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No:
Client Contact: Molly Reeves	Phone: 832 418 3307	E-Mail: darlene.bandy@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days): STANDARD			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #:			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Colorado	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	~~TDS~~	TSS	pH, Fluoride, Chloride, Sulfate	Ra226/Ra228 Combined	~~App III - Total Metals - Calcium, Boron~~	App IV - Total Metals (see list)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	D	D		
MW-14	06/04/19	0815	G	Water	N	N		X	X	X		X		App IV
~~MW-15~~	~~06/04/19~~	~~1005~~	~~G~~	~~Water~~	~~N~~	~~N~~		~~X~~	~~X~~	~~X~~		~~X~~		~~Analyses~~
~~MW-16~~	~~06/03/19~~	~~1252~~	~~G~~	~~Water~~	~~N~~	~~N~~		~~X~~	~~X~~	~~X~~		~~X~~		~~Standard TAT~~
~~MW-17~~	~~06/03/19~~	~~1415~~	~~G~~	~~Water~~	~~N~~	~~N~~		~~X~~	~~X~~	~~X~~		~~X~~		~~All metals in~~
MW-13	06/03/19	1135	G	Water	N	N		X	X	X		X		same 500 mL
MW-13EB	06/03/19	1200	G	W	N	N		X	X	X		X		Contact Molly
~~MW-16D~~	~~06/03/19~~	~~1252~~	~~G~~	~~W~~	~~N~~	~~N~~		~~X~~	~~X~~	~~X~~		~~X~~		~~Reeves~~ or
														Matt Mohr
														for further
														instructions.

App IV

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

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

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:

Empty Kit Relinquished by:	Date:		Time:		Method of Shipment:
Relinquished by: [signature]	Date/Time: 6-4-19 / 1100	Company: HDR	Received by: [signature]	Date/Time: 6/4/19 1100	Company: TADEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 0.9, 1.6, to, IR9, xf4 MP 6-4-19		

Ver: 08/04/2016

8/15/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-486296.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-124614-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 7/2/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method 3 of 3	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14 (280-124614-1)	6/4/19	09:15 Mountain		Water			X	X	X	2	
MW-13 (280-124614-5)	6/3/19	11:35 Mountain		Water			X	X	X	2	
MW-13EB (280-124614-6)	6/3/19	12:00 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: R Castro	Date/Time: 6-4-19 1700	Company TAD	Received by: [signature]	Date/Time: 6/5/19 08:55	Company TA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-486295.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-124614-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 6/27/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

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

573, W89

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 12 T, Metals (w/collision cell) - ApplV	7470A/FIELD_FLTRD Mercury (CVAA)	9056A_28D/ Flouride (IC) - App IV	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14 (280-124614-1)	6/4/19	09:15 Mountain		Water			X	X	X	3	Use Collision Cell
MW-13 (280-124614-5)	6/3/19	11:35 Mountain		Water			X	X	X	3	Use Collision Cell
MW-13EB (280-124614-6)	6/3/19	12:00 Mountain		Water			X	X	X	3	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4
Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: R Castro	Date/Time: 6-4-19 1700	Company: TAD	Received by:	Date/Time: 6/5/19 930	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : ____________

Client TA Denver Site Name ____________ Cooler unpacked by:
Cooler Received on 6/5/19 Opened on 6/5/19
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other
Receipt After-hours: Drop-off Date/Time ____________ Storage Location ____________

TestAmerica Cooler # NA Foam Box Client Cooler Box Other ____________
Packing material used: Bubble Wrap Foam Plastic Bag None Other ____________
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☒ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp.______°C Corrected Cooler Temp.______°C
   IR GUN #36 (CF +0.6°C) Observed Cooler Temp.______°C Corrected Cooler Temp.______°C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC984738**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____________ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____________ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____________

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION
Sample(s) ____________ were received after the recommended holding time had expired.
Sample(s) ____________ were received in a broken container.
Sample(s) ____________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION
Sample(s) ____________ were further preserved in the laboratory.
Time preserved: ____________ Preservative(s) added/Lot number(s): ____________

VOA Sample Preservation - Date/Time VOAs Frozen: ____________

WI-NC-099

Login # : ______________

TestAmerica Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	IR-8 #36	4.2	4.3	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36	2.0	2.1	Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-8 #36			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-124614-1

Login Number: 124614
List Number: 1
Creator: Paul, Ryan D

List Source: Eurofins TestAmerica, Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-124614-1

Login Number: 124614
List Number: 2
Creator: Harris, Lorin C

List Source: Eurofins TestAmerica, St. Louis
List Creation: 06/05/19 10:48 AM

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
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?	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	

Tracer/Carrier Summary

Client: HDR Inc Job ID: 280-124614-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-124614-1	MW-14	82.7
280-124614-5	MW-13	84.1
280-124614-6	MW-13EB	95.7
LCS 160-431495/1-A	Lab Control Sample	99.9
MB 160-431495/23-A	Method Blank	76.5

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-124614-1	MW-14	82.7	64.3
280-124614-5	MW-13	84.1	79.3
280-124614-6	MW-13EB	95.7	79.3
LCS 160-431600/1-A	Lab Control Sample	99.9	59.8
MB 160-431600/23-A	Method Blank	76.5	68.0

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

eurofins | Environment Testing
TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-124645-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Stephanie Rothmeyer

Authorized for release by:
8/7/2019 3:01:47 PM
Stephanie Rothmeyer, Project Manager I
(303)736-0182
stephanie.rothmeyer@testamericainc.com

Designee for

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Qualifiers

Metals

Qualifier	Qualifier Description
^	ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits.
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.
B	Compound was found in the blank and sample.
F1	MS and/or MSD Recovery is outside acceptance limits.
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
F3	Duplicate RPD exceeds the control limit
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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)

Job ID: 280-124645-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-124645-1

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

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

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

This report may include data with reporting limits (RLs) less than TestAmerica's standard reporting limit. These data and reporting limits are being used specifically to meet the needs of this project. Note that, data are not customarily reported to these levels without qualifiers, because they are inherently less reliable and potentially less defensible than the latest industry standards require.

RECEIPT

The samples were received on 6/4/2019 at 1:22 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.9º C.

TOTAL RECOVERABLE METALS

Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/10/2019 and analyzed on 06/11/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/10/2019 and analyzed on 06/11/2019 and 06/12/2019.

Beryllium was detected in method blank MB 240-385310/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Calcium failed the recovery criteria low for the MS and MSD of sample MW-10D (280-124645-3) in batch 240-385734. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

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

TOTAL MERCURY

Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 06/10/2019 and analyzed on 06/12/2019.

Mercury failed the recovery criteria high for the MS and MSD of sample MW-7 (280-124645-1) in batch 240-386086. Refer to the QC report for details.

Job ID: 280-124645-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

The continuing calibration verification (CCV) associated with batch 240-386086 recovered above the upper control limit for Mercury. The samples associated with this CCV were below the requested reporting limits for Mercury; therefore, the data have been reported.

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

TOTAL DISSOLVED SOLIDS
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 06/11/2019.

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

TOTAL SUSPENDED SOLIDS
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 06/11/2019.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample MW-7 (280-124645-1). Sample non-homogeneity is suspected.

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

CORROSIVITY (PH)
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 06/26/2019.

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

ANIONS (28 DAYS)
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 07/02/2019.

Samples MW-7 (280-124645-1)[5X], MW-10 (280-124645-2)[20X] and MW-10D (280-124645-3)[20X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

RADIUM-226 (GFPC)
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/14/2019 and analyzed on 08/06/2019.

The following sample was prepared at a reduced aliquot due to discoloration and heavy sediment levels: MW-7 (280-124645-1).

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.

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

RADIUM-228
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/14/2019 and analyzed on 07/23/2019.

Radium-228 exceeded the RPD limit for the duplicate of sample 180-90460-1. Both the sample and duplicate activity are less than the MDC.

Case Narrative

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Job ID: 280-124645-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

The following sample was prepared at a reduced aliquot due to discoloration and heavy sediment levels: MW-7 (280-124645-1).

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.

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

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-7 (280-124645-1), MW-10 (280-124645-2) and MW-10D (280-124645-3) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 08/07/2019.

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

Detection Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Client Sample ID: MW-7 — Lab Sample ID: 280-124645-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.3		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00081	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0013	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.037		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.0013	B	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	86		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0069		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0014		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.0025		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.033		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.026		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.010		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00055	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	180		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	2.0	J	2.5	0.30	mg/L	5		9056A	Total/NA
Sulfate	350		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	76		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-10 — Lab Sample ID: 280-124645-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.6		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00068	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0016	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.066		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00048	J B	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00022	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	270		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0024		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0046		0.0010	0.00019	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-10 (Continued)
Lab Sample ID: 280-124645-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.065		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.067		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0045	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	400		60	20	mg/L	20		9056A	Total/NA
Sulfate	1100		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	12		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-10D
Lab Sample ID: 280-124645-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.6		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00083	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0016	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.073		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00096	J B	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00029	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0025		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0050		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.072		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.075		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0051		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00035	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.1	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	400		60	20	mg/L	20		9056A	Total/NA
Sulfate	1100		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	7.6		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-124645-1	MW-7	Water	06/04/19 10:00	06/04/19 13:22	
280-124645-2	MW-10	Water	06/04/19 12:15	06/04/19 13:22	
280-124645-3	MW-10D	Water	06/04/19 12:20	06/04/19 13:22	

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-7
Date Collected: 06/04/19 10:00
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.3		0.10	0.023	mg/L		06/10/19 14:00	06/11/19 20:31	1

Client Sample ID: MW-10
Date Collected: 06/04/19 12:15
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.6		0.10	0.023	mg/L		06/10/19 14:00	06/11/19 20:35	1

Client Sample ID: MW-10D
Date Collected: 06/04/19 12:20
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.6		0.10	0.023	mg/L		06/10/19 14:00	06/11/19 20:09	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-7
Date Collected: 06/04/19 10:00
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00081	J	0.0020	0.00057	mg/L		06/10/19 14:00	06/11/19 19:05	1
Arsenic	0.0013	J	0.0050	0.00075	mg/L		06/10/19 14:00	06/11/19 19:05	1
Barium	0.037		0.0050	0.0022	mg/L		06/10/19 14:00	06/11/19 19:05	1
Beryllium	0.0013	B	0.0010	0.00031	mg/L		06/10/19 14:00	06/12/19 16:36	1
Cadmium	0.00024	J	0.0010	0.00021	mg/L		06/10/19 14:00	06/11/19 19:05	1
Calcium	86		1.0	0.58	mg/L		06/10/19 14:00	06/11/19 19:05	1
Chromium	0.0069		0.0020	0.00098	mg/L		06/10/19 14:00	06/11/19 19:05	1
Cobalt	0.0014		0.0010	0.00019	mg/L		06/10/19 14:00	06/11/19 19:05	1
Lead	0.0025		0.0010	0.00045	mg/L		06/10/19 14:00	06/11/19 19:05	1
Lithium	0.033		0.0080	0.0017	mg/L		06/10/19 14:00	06/12/19 16:36	1
Molybdenum	0.026		0.010	0.0011	mg/L		06/10/19 14:00	06/11/19 19:05	1
Selenium	0.010		0.0050	0.00089	mg/L		06/10/19 14:00	06/11/19 19:05	1
Thallium	0.00055	J	0.0010	0.00020	mg/L		06/10/19 14:00	06/11/19 19:05	1

Client Sample ID: MW-10
Date Collected: 06/04/19 12:15
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00068	J	0.0020	0.00057	mg/L		06/10/19 14:00	06/11/19 19:08	1
Arsenic	0.0016	J	0.0050	0.00075	mg/L		06/10/19 14:00	06/11/19 19:08	1
Barium	0.066		0.0050	0.0022	mg/L		06/10/19 14:00	06/11/19 19:08	1
Beryllium	0.00048	J B	0.0010	0.00031	mg/L		06/10/19 14:00	06/12/19 16:39	1
Cadmium	0.00022	J	0.0010	0.00021	mg/L		06/10/19 14:00	06/11/19 19:08	1
Calcium	270		1.0	0.58	mg/L		06/10/19 14:00	06/11/19 19:08	1
Chromium	0.0024		0.0020	0.00098	mg/L		06/10/19 14:00	06/11/19 19:08	1
Cobalt	0.0046		0.0010	0.00019	mg/L		06/10/19 14:00	06/11/19 19:08	1
Lead	ND		0.0010	0.00045	mg/L		06/10/19 14:00	06/11/19 19:08	1
Lithium	0.065		0.0080	0.0017	mg/L		06/10/19 14:00	06/12/19 16:39	1
Molybdenum	0.067		0.010	0.0011	mg/L		06/10/19 14:00	06/11/19 19:08	1
Selenium	0.0045	J	0.0050	0.00089	mg/L		06/10/19 14:00	06/11/19 19:08	1
Thallium	ND		0.0010	0.00020	mg/L		06/10/19 14:00	06/11/19 19:08	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-10D
Date Collected: 06/04/19 12:20
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00083	J	0.0020	0.00057	mg/L		06/10/19 14:00	06/11/19 18:48	1
Arsenic	0.0016	J	0.0050	0.00075	mg/L		06/10/19 14:00	06/11/19 18:48	1
Barium	0.073		0.0050	0.0022	mg/L		06/10/19 14:00	06/11/19 18:48	1
Beryllium	0.00096	J B	0.0010	0.00031	mg/L		06/10/19 14:00	06/12/19 16:19	1
Cadmium	0.00029	J	0.0010	0.00021	mg/L		06/10/19 14:00	06/11/19 18:48	1
Calcium	300		1.0	0.58	mg/L		06/10/19 14:00	06/11/19 18:48	1
Chromium	0.0025		0.0020	0.00098	mg/L		06/10/19 14:00	06/11/19 18:48	1
Cobalt	0.0050		0.0010	0.00019	mg/L		06/10/19 14:00	06/11/19 18:48	1
Lead	ND		0.0010	0.00045	mg/L		06/10/19 14:00	06/11/19 18:48	1
Lithium	0.072		0.0080	0.0017	mg/L		06/10/19 14:00	06/12/19 16:19	1
Molybdenum	0.075		0.010	0.0011	mg/L		06/10/19 14:00	06/11/19 18:48	1
Selenium	0.0051		0.0050	0.00089	mg/L		06/10/19 14:00	06/11/19 18:48	1
Thallium	0.00035	J	0.0010	0.00020	mg/L		06/10/19 14:00	06/11/19 18:48	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-7
Date Collected: 06/04/19 10:00
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/10/19 12:00	06/12/19 19:06	1

Client Sample ID: MW-10
Date Collected: 06/04/19 12:15
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/10/19 12:00	06/12/19 19:13	1

Client Sample ID: MW-10D
Date Collected: 06/04/19 12:20
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/10/19 12:00	06/12/19 19:00	1

General Chemistry

Client Sample ID: MW-7
Date Collected: 06/04/19 10:00
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU			06/26/19 18:35	1
Temperature	21.9	HF	1.0	1.0	Degrees C			06/26/19 18:35	1
Chloride	180		15	5.1	mg/L			07/02/19 20:18	5
Fluoride	2.0	J	2.5	0.30	mg/L			07/02/19 20:18	5
Sulfate	350		25	5.2	mg/L			07/02/19 20:18	5
Total Dissolved Solids (TDS)	1000		20	9.4	mg/L			06/11/19 12:24	1
Total Suspended Solids	76		4.0	1.1	mg/L			06/11/19 21:21	1

Client Sample Results

Client: HDR Inc
Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

General Chemistry

Client Sample ID: MW-10
Lab Sample ID: 280-124645-2
Date Collected: 06/04/19 12:15
Matrix: Water
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**8.2**	**HF**	0.1	0.1	SU			06/26/19 18:31	1
Temperature	**22.6**	**HF**	1.0	1.0	Degrees C			06/26/19 18:31	1
Chloride	**400**		60	20	mg/L			07/02/19 20:37	20
Fluoride	ND		10	1.2	mg/L			07/02/19 20:37	20
Sulfate	**1100**		100	21	mg/L			07/02/19 20:37	20
Total Dissolved Solids (TDS)	**2200**		20	9.4	mg/L			06/11/19 12:24	1
Total Suspended Solids	**12**		4.0	1.1	mg/L			06/11/19 21:21	1

Client Sample ID: MW-10D
Lab Sample ID: 280-124645-3
Date Collected: 06/04/19 12:20
Matrix: Water
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**8.1**	**HF**	0.1	0.1	SU			06/26/19 18:28	1
Temperature	**21.9**	**HF**	1.0	1.0	Degrees C			06/26/19 18:28	1
Chloride	**400**		60	20	mg/L			07/02/19 21:33	20
Fluoride	ND		10	1.2	mg/L			07/02/19 21:33	20
Sulfate	**1100**		100	21	mg/L			07/02/19 21:33	20
Total Dissolved Solids (TDS)	**2200**		20	9.4	mg/L			06/11/19 12:24	1
Total Suspended Solids	**7.6**		4.0	1.1	mg/L			06/11/19 21:21	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-7
Lab Sample ID: 280-124645-1
Date Collected: 06/04/19 10:00
Matrix: Water
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.218	U	0.163	0.165	1.00	0.240	pCi/L	06/14/19 10:26	08/06/19 12:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.7*		*40 - 110*	*06/14/19 10:26*	*08/06/19 12:37*	*1*

Client Sample ID: MW-10
Lab Sample ID: 280-124645-2
Date Collected: 06/04/19 12:15
Matrix: Water
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0319	U	0.0528	0.0528	1.00	0.0921	pCi/L	06/14/19 10:26	08/06/19 12:37	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.3*		*40 - 110*	*06/14/19 10:26*	*08/06/19 12:37*	*1*

Client Sample ID: MW-10D
Lab Sample ID: 280-124645-3
Date Collected: 06/04/19 12:20
Matrix: Water
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0467	U	0.0582	0.0583	1.00	0.0962	pCi/L	06/14/19 10:26	08/06/19 12:37	1

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

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.9*		*40 - 110*	*06/14/19 10:26*	*08/06/19 12:37*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-7 **Lab Sample ID: 280-124645-1**
Date Collected: 06/04/19 10:00 **Matrix: Water**
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.481	U	0.524	0.526	1.00	0.859	pCi/L	06/14/19 14:38	07/23/19 09:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.7*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*
Y Carrier	*89.0*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*

Client Sample ID: MW-10 **Lab Sample ID: 280-124645-2**
Date Collected: 06/04/19 12:15 **Matrix: Water**
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.208	U	0.223	0.224	1.00	0.365	pCi/L	06/14/19 14:38	07/23/19 09:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.3*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*
Y Carrier	*87.9*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*

Client Sample ID: MW-10D **Lab Sample ID: 280-124645-3**
Date Collected: 06/04/19 12:20 **Matrix: Water**
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.153	U	0.232	0.232	1.00	0.389	pCi/L	06/14/19 14:38	07/23/19 09:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.9*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*
Y Carrier	*86.7*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:58*	*1*

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

Client Sample ID: MW-7 **Lab Sample ID: 280-124645-1**
Date Collected: 06/04/19 10:00 **Matrix: Water**
Date Received: 06/04/19 13:22

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.699	U	0.549	0.551	5.00	0.859	pCi/L		08/07/19 08:30	1

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

Client Sample ID: MW-10
Date Collected: 06/04/19 12:15
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.240	U	0.229	0.230	5.00	0.365	pCi/L		08/07/19 08:30	1

Client Sample ID: MW-10D
Date Collected: 06/04/19 12:20
Date Received: 06/04/19 13:22

Lab Sample ID: 280-124645-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.199	U	0.239	0.239	5.00	0.389	pCi/L		08/07/19 08:30	1

Client: HDR Inc
Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-385310/1-A
Matrix: Water
Analysis Batch: 385719
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		06/10/19 14:00	06/11/19 20:01	1

Lab Sample ID: LCS 240-385310/2-A
Matrix: Water
Analysis Batch: 385719
Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.04		mg/L		104	80 - 120

Lab Sample ID: 280-124645-3 MS
Matrix: Water
Analysis Batch: 385719
Client Sample ID: MW-10D
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	2.6		1.00	3.75		mg/L		113	75 - 125

Lab Sample ID: 280-124645-3 MSD
Matrix: Water
Analysis Batch: 385719
Client Sample ID: MW-10D
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	2.6		1.00	3.61		mg/L		98	75 - 125	4	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-385310/1-A
Matrix: Water
Analysis Batch: 385734
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/10/19 14:00	06/11/19 18:43	1
Arsenic	ND		0.0050	0.00075	mg/L		06/10/19 14:00	06/11/19 18:43	1
Barium	ND		0.0050	0.0022	mg/L		06/10/19 14:00	06/11/19 18:43	1
Cadmium	ND		0.0010	0.00021	mg/L		06/10/19 14:00	06/11/19 18:43	1
Calcium	ND		1.0	0.58	mg/L		06/10/19 14:00	06/11/19 18:43	1
Chromium	ND		0.0020	0.00098	mg/L		06/10/19 14:00	06/11/19 18:43	1
Cobalt	ND		0.0010	0.00019	mg/L		06/10/19 14:00	06/11/19 18:43	1
Lead	ND		0.0010	0.00045	mg/L		06/10/19 14:00	06/11/19 18:43	1
Molybdenum	ND		0.010	0.0011	mg/L		06/10/19 14:00	06/11/19 18:43	1
Selenium	ND		0.0050	0.00089	mg/L		06/10/19 14:00	06/11/19 18:43	1
Thallium	ND		0.0010	0.00020	mg/L		06/10/19 14:00	06/11/19 18:43	1

Lab Sample ID: MB 240-385310/1-A
Matrix: Water
Analysis Batch: 385832
Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 385310

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	0.000981	J	0.0010	0.00031	mg/L		06/10/19 14:00	06/12/19 16:14	1
Lithium	ND		0.0080	0.0017	mg/L		06/10/19 14:00	06/12/19 16:14	1

Client: HDR Inc	Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

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

Lab Sample ID: LCS 240-385310/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 385734 — **Prep Batch: 385310**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0993		mg/L		99	80 - 120
Arsenic	1.00	0.979		mg/L		98	80 - 120
Barium	1.00	0.961		mg/L		96	80 - 120
Cadmium	0.500	0.491		mg/L		98	80 - 120
Calcium	25.0	23.3		mg/L		93	80 - 120
Chromium	0.500	0.494		mg/L		99	80 - 120
Cobalt	0.500	0.497		mg/L		99	80 - 120
Lead	0.500	0.493		mg/L		99	80 - 120
Molybdenum	0.500	0.489		mg/L		98	80 - 120
Selenium	1.00	1.03		mg/L		103	80 - 120
Thallium	1.00	0.941		mg/L		94	80 - 120

Lab Sample ID: LCS 240-385310/3-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 385832 — **Prep Batch: 385310**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	0.500	0.476		mg/L		95	80 - 120
Lithium	0.500	0.460		mg/L		92	80 - 120

Lab Sample ID: 280-124645-3 MS — **Client Sample ID: MW-10D**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 385734 — **Prep Batch: 385310**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.00083	J	0.100	0.107		mg/L		106	75 - 125
Arsenic	0.0016	J	1.00	1.09		mg/L		109	75 - 125
Barium	0.073		1.00	1.08		mg/L		101	75 - 125
Cadmium	0.00029	J	0.500	0.500		mg/L		100	75 - 125
Calcium	300		25.0	309	4	mg/L		21	75 - 125
Chromium	0.0025		0.500	0.503		mg/L		100	75 - 125
Cobalt	0.0050		0.500	0.530		mg/L		105	75 - 125
Lead	ND		0.500	0.501		mg/L		100	75 - 125
Molybdenum	0.075		0.500	0.617		mg/L		108	75 - 125
Selenium	0.0051		1.00	1.08		mg/L		107	75 - 125
Thallium	0.00035	J	1.00	0.959		mg/L		96	75 - 125

Lab Sample ID: 280-124645-3 MS — **Client Sample ID: MW-10D**
Matrix: Water — **Prep Type: Total Recoverable**
Analysis Batch: 385832 — **Prep Batch: 385310**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	0.00096	J B	0.500	0.487		mg/L		97	75 - 125
Lithium	0.072		0.500	0.527		mg/L		91	75 - 125

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

Lab Sample ID: 280-124645-3 MSD
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 385734
Prep Batch: 385310

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.00083	J	0.100	0.103		mg/L		102	75 - 125	4	20
Arsenic	0.0016	J	1.00	1.08		mg/L		108	75 - 125	1	20
Barium	0.073		1.00	1.07		mg/L		100	75 - 125	1	20
Cadmium	0.00029	J	0.500	0.487		mg/L		97	75 - 125	3	20
Calcium	300		25.0	306	4	mg/L		9	75 - 125	1	20
Chromium	0.0025		0.500	0.497		mg/L		99	75 - 125	1	20
Cobalt	0.0050		0.500	0.530		mg/L		105	75 - 125	0	20
Lead	ND		0.500	0.484		mg/L		97	75 - 125	4	20
Molybdenum	0.075		0.500	0.609		mg/L		107	75 - 125	1	20
Selenium	0.0051		1.00	1.07		mg/L		107	75 - 125	1	20
Thallium	0.00035	J	1.00	0.932		mg/L		93	75 - 125	3	20

Lab Sample ID: 280-124645-3 MSD
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 385832
Prep Batch: 385310

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Beryllium	0.00096	J B	0.500	0.481		mg/L		96	75 - 125	1	20
Lithium	0.072		0.500	0.530		mg/L		92	75 - 125	0	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-385321/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 385861
Prep Batch: 385321

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/10/19 12:00	06/12/19 18:56	1

Lab Sample ID: MB 240-385321/1-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 386086
Prep Batch: 385321

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		06/10/19 12:00	06/13/19 12:08	1

Lab Sample ID: LCS 240-385321/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 385861
Prep Batch: 385321

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.33		ug/L		87	80 - 120

Lab Sample ID: LCS 240-385321/2-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 386086
Prep Batch: 385321

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.66		ug/L		93	80 - 120

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: 280-124645-1 MS | **Client Sample ID: MW-7**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 385861 | **Prep Batch: 385321**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		1.00	0.911		ug/L		91	80 - 120

Lab Sample ID: 280-124645-1 MS | **Client Sample ID: MW-7**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 386086 | **Prep Batch: 385321**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND	F1	1.00	1.30	F1 ^	ug/L		130	80 - 120

Lab Sample ID: 280-124645-1 MSD | **Client Sample ID: MW-7**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 385861 | **Prep Batch: 385321**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		1.00	0.934		ug/L		93	80 - 120	2	20

Lab Sample ID: 280-124645-1 MSD | **Client Sample ID: MW-7**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 386086 | **Prep Batch: 385321**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND	F1	1.00	1.31	F1 ^	ug/L		131	80 - 120	0	20

Method: 9040B - pH

Lab Sample ID: LCS 280-462887/53 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 462887

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-463419/6 | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 463419

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			07/02/19 17:15	1
Fluoride	ND		0.50	0.060	mg/L			07/02/19 17:15	1
Sulfate	ND		5.0	1.0	mg/L			07/02/19 17:15	1

Lab Sample ID: LCS 280-463419/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 463419

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	105		mg/L		105	90 - 110
Fluoride	5.00	4.87		mg/L		97	90 - 110

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

Lab Sample ID: LCS 280-463419/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 463419

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	101		mg/L		101	90 - 110

Lab Sample ID: LCSD 280-463419/5
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 463419

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	105		mg/L		105	90 - 110	0	10
Fluoride	5.00	4.87		mg/L		97	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	1	10

Lab Sample ID: MRL 280-463419/3
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 463419

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.68	J	mg/L		107	50 - 150
Fluoride	0.200	0.169	J	mg/L		84	50 - 150
Sulfate	2.50	2.57	J	mg/L		103	50 - 150

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

Lab Sample ID: MB 280-461166/1
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 461166

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			06/11/19 12:24	1

Lab Sample ID: LCS 280-461166/2
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 461166

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	506		mg/L		101	93 - 110

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-461227/2
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 461227

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			06/11/19 21:21	1

Lab Sample ID: LCS 280-461227/1
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 461227

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	105		mg/L		105	79 - 114

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: LCSD 280-461227/25
Matrix: Water
Analysis Batch: 461227
Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			100	106		mg/L		106	79 - 114	1	20

Lab Sample ID: 280-124645-1 DU
Matrix: Water
Analysis Batch: 461227
Client Sample ID: MW-7
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Suspended Solids	76			66.8	F3	mg/L				13	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-431743/23-A
Matrix: Water
Analysis Batch: 438262
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431743

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.05652	U	0.0417	0.0420	1.00	0.112	pCi/L	06/14/19 10:26	08/06/19 12:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.9*		*40 - 110*	*06/14/19 10:26*	*08/06/19 12:38*	*1*

Lab Sample ID: LCS 160-431743/1-A
Matrix: Water
Analysis Batch: 438000
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 431743

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226			11.4	10.86		1.12	1.00	0.112	pCi/L	96	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.8*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-431783/23-A
Matrix: Water
Analysis Batch: 436112
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 431783

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1145	U	0.199	0.200	1.00	0.338	pCi/L	06/14/19 14:38	07/23/19 09:59	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.9*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:59*	*1*
Y Carrier	*92.0*		*40 - 110*	*06/14/19 14:38*	*07/23/19 09:59*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-431783/1-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 436108 **Prep Batch: 431783**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.00	8.661		1.04	1.00	0.397	pCi/L	96	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.8*		*40 - 110*
Y Carrier	*84.5*		*40 - 110*

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-124645-1

Metals

Prep Batch: 385310

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total Recoverable	Water	3005A	
280-124645-2	MW-10	Total Recoverable	Water	3005A	
280-124645-3	MW-10D	Total Recoverable	Water	3005A	
MB 240-385310/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-385310/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-385310/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-124645-3 MS	MW-10D	Total Recoverable	Water	3005A	
280-124645-3 MS	MW-10D	Total Recoverable	Water	3005A	
280-124645-3 MSD	MW-10D	Total Recoverable	Water	3005A	
280-124645-3 MSD	MW-10D	Total Recoverable	Water	3005A	

Prep Batch: 385321

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	7470A	
280-124645-2	MW-10	Total/NA	Water	7470A	
280-124645-3	MW-10D	Total/NA	Water	7470A	
MB 240-385321/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-385321/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-124645-1 MS	MW-7	Total/NA	Water	7470A	
280-124645-1 MSD	MW-7	Total/NA	Water	7470A	

Analysis Batch: 385719

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total Recoverable	Water	6010C	385310
280-124645-2	MW-10	Total Recoverable	Water	6010C	385310
280-124645-3	MW-10D	Total Recoverable	Water	6010C	385310
MB 240-385310/1-A	Method Blank	Total Recoverable	Water	6010C	385310
LCS 240-385310/2-A	Lab Control Sample	Total Recoverable	Water	6010C	385310
280-124645-3 MS	MW-10D	Total Recoverable	Water	6010C	385310
280-124645-3 MSD	MW-10D	Total Recoverable	Water	6010C	385310

Analysis Batch: 385734

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total Recoverable	Water	6020A	385310
280-124645-2	MW-10	Total Recoverable	Water	6020A	385310
280-124645-3	MW-10D	Total Recoverable	Water	6020A	385310
MB 240-385310/1-A	Method Blank	Total Recoverable	Water	6020A	385310
LCS 240-385310/3-A	Lab Control Sample	Total Recoverable	Water	6020A	385310
280-124645-3 MS	MW-10D	Total Recoverable	Water	6020A	385310
280-124645-3 MSD	MW-10D	Total Recoverable	Water	6020A	385310

Analysis Batch: 385832

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total Recoverable	Water	6020A	385310
280-124645-2	MW-10	Total Recoverable	Water	6020A	385310
280-124645-3	MW-10D	Total Recoverable	Water	6020A	385310
MB 240-385310/1-A	Method Blank	Total Recoverable	Water	6020A	385310
LCS 240-385310/3-A	Lab Control Sample	Total Recoverable	Water	6020A	385310
280-124645-3 MS	MW-10D	Total Recoverable	Water	6020A	385310
280-124645-3 MSD	MW-10D	Total Recoverable	Water	6020A	385310

Metals

Analysis Batch: 385861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	7470A	385321
280-124645-2	MW-10	Total/NA	Water	7470A	385321
280-124645-3	MW-10D	Total/NA	Water	7470A	385321
MB 240-385321/1-A	Method Blank	Total/NA	Water	7470A	385321
LCS 240-385321/2-A	Lab Control Sample	Total/NA	Water	7470A	385321
280-124645-1 MS	MW-7	Total/NA	Water	7470A	385321
280-124645-1 MSD	MW-7	Total/NA	Water	7470A	385321

Analysis Batch: 386086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-385321/1-A	Method Blank	Total/NA	Water	7470A	385321
LCS 240-385321/2-A	Lab Control Sample	Total/NA	Water	7470A	385321
280-124645-1 MS	MW-7	Total/NA	Water	7470A	385321
280-124645-1 MSD	MW-7	Total/NA	Water	7470A	385321

General Chemistry

Analysis Batch: 461166

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	SM 2540C	
280-124645-2	MW-10	Total/NA	Water	SM 2540C	
280-124645-3	MW-10D	Total/NA	Water	SM 2540C	
MB 280-461166/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-461166/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 461227

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	SM 2540D	
280-124645-2	MW-10	Total/NA	Water	SM 2540D	
280-124645-3	MW-10D	Total/NA	Water	SM 2540D	
MB 280-461227/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-461227/1	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-461227/25	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
280-124645-1 DU	MW-7	Total/NA	Water	SM 2540D	

Analysis Batch: 462887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	9040B	
280-124645-2	MW-10	Total/NA	Water	9040B	
280-124645-3	MW-10D	Total/NA	Water	9040B	
LCS 280-462887/53	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 463419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	9056A	
280-124645-2	MW-10	Total/NA	Water	9056A	
280-124645-3	MW-10D	Total/NA	Water	9056A	
MB 280-463419/6	Method Blank	Total/NA	Water	9056A	
LCS 280-463419/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-463419/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-463419/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 431743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	PrecSep-21	
280-124645-2	MW-10	Total/NA	Water	PrecSep-21	
280-124645-3	MW-10D	Total/NA	Water	PrecSep-21	
MB 160-431743/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-431743/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 431783

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-124645-1	MW-7	Total/NA	Water	PrecSep_0	
280-124645-2	MW-10	Total/NA	Water	PrecSep_0	
280-124645-3	MW-10D	Total/NA	Water	PrecSep_0	
MB 160-431783/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-431783/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc

Job ID: 280-124645-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-7

Lab Sample ID: 280-124645-1

Date Collected: 06/04/19 10:00

Matrix: Water

Date Received: 06/04/19 13:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			385719	06/11/19 20:31	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385734	06/11/19 19:05	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385832	06/12/19 16:36	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	385321	06/10/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385861	06/12/19 19:06	AJC	TAL CAN
Total/NA	Analysis	9040B		1			462887	06/26/19 18:35	SGB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	463419	07/02/19 20:18	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	461166	06/11/19 12:24	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	461227	06/11/19 21:21	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			500.82 mL	1.0 g	431743	06/14/19 10:26	KAW	TAL SL
Total/NA	Analysis	9315		1			438290	08/06/19 12:37	KLS	TAL SL
Total/NA	Prep	PrecSep_0			500.82 mL	1.0 g	431783	06/14/19 14:38	KAW	TAL SL
Total/NA	Analysis	9320		1			436112	07/23/19 09:58	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			438566	08/07/19 08:30	SMP	TAL SL

Client Sample ID: MW-10

Lab Sample ID: 280-124645-2

Date Collected: 06/04/19 12:15

Matrix: Water

Date Received: 06/04/19 13:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			385719	06/11/19 20:35	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385734	06/11/19 19:08	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385832	06/12/19 16:39	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	385321	06/10/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385861	06/12/19 19:13	AJC	TAL CAN
Total/NA	Analysis	9040B		1			462887	06/26/19 18:31	SGB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	463419	07/02/19 20:37	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	461166	06/11/19 12:24	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	461227	06/11/19 21:21	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.23 mL	1.0 g	431743	06/14/19 10:26	KAW	TAL SL
Total/NA	Analysis	9315		1			438290	08/06/19 12:37	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.23 mL	1.0 g	431783	06/14/19 14:38	KAW	TAL SL
Total/NA	Analysis	9320		1			436112	07/23/19 09:58	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			438566	08/07/19 08:30	SMP	TAL SL

Client Sample ID: MW-10D **Lab Sample ID: 280-124645-3**
Date Collected: 06/04/19 12:20 **Matrix: Water**
Date Received: 06/04/19 13:22

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			385719	06/11/19 20:09	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385734	06/11/19 18:48	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	385310	06/10/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			385832	06/12/19 16:19	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	385321	06/10/19 12:00	SLD	TAL CAN
Total/NA	Analysis	7470A		1			385861	06/12/19 19:00	AJC	TAL CAN
Total/NA	Analysis	9040B		1			462887	06/26/19 18:28	SGB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	463419	07/02/19 21:33	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	461166	06/11/19 12:24	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	461227	06/11/19 21:21	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.07 mL	1.0 g	431743	06/14/19 10:26	KAW	TAL SL
Total/NA	Analysis	9315		1			438290	08/06/19 12:37	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.07 mL	1.0 g	431783	06/14/19 14:38	KAW	TAL SL
Total/NA	Analysis	9320		1			436112	07/23/19 09:58	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			438566	08/07/19 08:30	SMP	TAL SL

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Accreditation/Certification Summary

Client: HDR Inc Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	EPA Region	Identification Number	Expiration Date
Oregon	NELAP	10	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State		2927	02-23-20
California	State Program	9	2927	02-23-20
Connecticut	State		PH-0590	12-31-19
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-20
Illinois	NELAP	5	200004	07-31-20
Illinois	NELAP		004498	07-31-19
Iowa	State Program	7	421	06-01-21
Kansas	NELAP	7	E-10336	04-30-20
Kansas	NELAP		E-10336	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State		KY98016	12-31-19
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota	NELAP		OH00048	12-31-19
Minnesota (Petrofund)	State Program	1	3506	07-31-21
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-20
New York	NELAP	2	10975	03-31-20
New York	NELAP		10975	03-31-20
Ohio VAP	State		CL0024	06-05-21
Ohio VAP	State Program	5	CL0024	06-05-21
Oregon	NELAP	10	4062	02-23-20
Oregon	NELAP		4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Pennsylvania	NELAP		68-00340	08-31-19
Texas	NELAP	6	T104704517-19-11	08-31-20
Texas	NELAP		T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19 *
Virginia	NELAP		010101	09-14-19
Washington	State		C971	01-12-20
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State		210	12-31-19
West Virginia DEP	State Program	3	210	12-31-19

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	EPA Region	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP		L2305	04-06-22
ANAB	DoD		L2305	04-06-22
ANAB	DOE		L2305.01	04-06-22
Arizona	State		AZ0813	12-08-19
Arizona	State Program	9	AZ0813	12-08-19
California	State Program	9	2886	06-30-20
Connecticut	State Program	1	PH-0241	03-31-21
Florida	NELAP	4	E87689	06-30-20
Florida	NELAP		E87689	06-30-20
Hawaii	State Program	9	NA	06-30-19 *
Illinois	NELAP	5	200023	11-30-19
Illinois	NELAP		004553	11-30-19
Iowa	State Program	7	373	12-01-20
Kansas	NELAP	7	E-10236	10-31-19
Kentucky (DW)	State		KY90125	12-31-19
Kentucky (DW)	State Program	4	KY90125	12-31-19
Louisiana	NELAP	6	04080	06-30-20
Louisiana (DW)	NELAP	6	LA011	12-31-19
Louisiana (DW)	State		LA011	12-31-19
Maryland	State		310	09-30-20
Maryland	State Program	3	310	09-30-20
Michigan	State Program	5	9005	06-30-19 *
Missouri	State		780	06-30-22
Missouri	State Program	7	780	06-30-20
New Jersey	NELAP	2	MO002	06-30-20
New Jersey	NELAP		MO002	06-30-20
New York	NELAP	2	11616	03-31-20
New York	NELAP		11616	04-01-20
North Dakota	State Program	8	R207	06-30-20
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State		9997	08-31-19
Oklahoma	State Program	6	9997	08-31-19 *
Pennsylvania	NELAP	3	68-00540	02-28-20
Pennsylvania	NELAP		68-00540	02-28-20
South Carolina	State Program	4	85002001	06-30-20
Texas	NELAP	6	T104704193-18-13	07-31-19 *
Texas	NELAP		T104704193-19-13	07-31-20
US Fish & Wildlife	Federal		058448	07-31-20
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542018-10	07-31-19 *
Virginia	NELAP	3	460230	06-14-20
Virginia	NELAP		10310	06-14-20
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	08-31-19 *

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

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Denver #280

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Client Information			
Sampler: Emily Muñoz	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No:
Client Contact: Molly Reeves	Phone: 720 273 3436	E-Mail: darlene.bandy@testamericainc.com	Page: Page 1 of 1
Company: HDR Inc			Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:		
City: Englewood	TAT Requested (days): Standard		
State, Zip: CO, 80112			
Phone: 734-263-7138(Tel)	PO #:		
Email: anna.lundin@hdrinc.com	WO #:		
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371		
Site: Colorado	SSOW#:		

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	TDS	TSS	pH, Fluoride, Chloride, Sulfate	Ra226/Ra228 Combined	App III - Total Metals - Calcium, Boron	App IV - Total Metals (see list)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	D	D	D		
MW-7	06/04/19	1000	G	Water	N	N	X	X	X	X	X	X		
MW-10	06/04/19	1215	G	Water	N	N	X	X	X	X	X	X		
MW-10D	06/04/19	1220	G	Water	N	N	X	X	X	X	X	X		
MW-				Water										
MW-				Water										

EM 06/04

280-124645 Chain of Custody

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

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6-4-19 1322	HDR	[signature]	6/4/19 1322	TA DEN

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 3.9, +0, IR #9 by AP 6/4/19

Ver: 08/04/2016

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-486434.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-124645-1
Address: 13715 Rider Trail North,	Due Date Requested: 7/1/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPC/ (MOD) Local Method	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-7 (280-124645-1)	6/4/19	10:00 Mountain		Water			X	X	X	2	
MW-10 (280-124645-2)	6/4/19	12:15 Mountain		Water			X	X	X	2	
MW-10D (280-124645-3)	6/4/19	12:20 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) | Primary Deliverable Rank: 4 | Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: D Castro	Date/Time: 6-5-19 1700	Company: TAD	Received by: Michael Heum	Date/Time: 6-6-19 09:20	Company: TA STL
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

1-8/1.9

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-486435.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-124645-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 6/28/2019	**Analysis Requested**		**Preservation Codes:**
City: North Canton	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA; M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 13 T. Metals (w/collision cell)	6010C/3005A Boron	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note: ~~$40~~ 580
			Preservation Code:								
MW-7 (280-124645-1)	6/4/19	10:00 Mountain		Water			X	X	X	1	Use Collision Cell
MW-10 (280-124645-2)	6/4/19	12:15 Mountain		Water			X	X	X	1	Use Collision Cell
MW-10D (280-124645-3)	6/4/19	12:20 Mountain		Water			X	X	X	1	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*	
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*	
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4	Special Instructions/QC Requirements:	

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by: J Castro	Date/Time: 6-5-19 1700	Company: TAD	Received by: [signature]	Date/Time: 6/8/19 930	Company: TD
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Custody Seals Intact:	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : ____________

Canton Facility

Client TA Denver Site Name ____________ Cooler unpacked by:

Cooler Received on 6/7/19 Opened on 6/7/19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time ____________ Storage Location ____________

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ____________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ____________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF +0.1 °C) Observed Cooler Temp. 1.8 °C Corrected Cooler Temp. 1.9 °C
   IR GUN #36 (CF +0.6°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA — pH Strip Lot# **HC984738**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____________ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____________ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____________ Date ____________ by ____________ via Verbal Voice Mail Other

Concerning ____________

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____________ were received after the recommended holding time had expired.

Sample(s) ____________ were received in a broken container.

Sample(s) ____________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____________ were further preserved in the laboratory.

Time preserved: ____________ Preservative(s) added/Lot number(s): ____________

VOA Sample Preservation - Date/Time VOAs Frozen: ____________

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc — Job Number: 280-124645-1

Login Number: 124645 — **List Source: Eurofins TestAmerica, Denver**
List Number: 1
Creator: Paul, Amanda E

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-124645-1

Login Number: 124645
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 06/06/19 10:15 AM

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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.4
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	

Tracer/Carrier Summary

Client: HDR Inc　　　　Job ID: 280-124645-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
		Ba Carrier
Lab Sample ID	Client Sample ID	(40-110)
280-124645-1	MW-7	88.7
280-124645-2	MW-10	98.3
280-124645-3	MW-10D	98.9
LCS 160-431743/1-A	Lab Control Sample	91.8
MB 160-431743/23-A	Method Blank	96.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
		Ba Carrier	Y Carrier
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
280-124645-1	MW-7	88.7	89.0
280-124645-2	MW-10	98.3	87.9
280-124645-3	MW-10D	98.9	86.7
LCS 160-431783/1-A	Lab Control Sample	91.8	84.5
MB 160-431783/23-A	Method Blank	96.9	92.0

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

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TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-126505-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
9/11/2019 2:37:39 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Table of Contents

Definitions/Glossary

Qualifiers

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.

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)

Job ID: 280-126505-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-126505-1

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

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

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

RECEIPT

The samples were received on 7/23/2019 1:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.6º C.

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 07/29/2019 and analyzed on 07/30/2019.

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

TOTAL MERCURY

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 07/29/2019.

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

ANIONS (28 DAYS)

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 08/10/2019.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 07/26/2019 and analyzed on 09/10/2019.

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.

Job ID: 280-126505-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.
MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5), MW-16D (280-126505-6), (LCS 160-436668/1-A), (LCSD 160-436668/2-A) and (MB 160-436668/11-A)

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-228

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 07/26/2019 and analyzed on 09/06/2019.

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-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5), MW-16D (280-126505-6), (LCS 160-436668/1-A), (LCSD 160-436668/2-A) and (MB 160-436668/11-A)

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-226/RADIUM-228 (GFPC)

Samples MW-14 (280-126505-1), MW-15 (280-126505-2), MW-16 (280-126505-3), MW-17 (280-126505-4), MW-14EB (280-126505-5) and MW-16D (280-126505-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 09/11/2019.

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

Detection Summary

Client: HDR Inc

Job ID: 280-126505-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 Lab Sample ID: 280-126505-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0013	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.050		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.00060	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0066		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.027		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.00046	J	0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0063		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.072		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	2.0		0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: MW-15 Lab Sample ID: 280-126505-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0014	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0022	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.043		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0043		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.021		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.036		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.090		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	1.1		0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: MW-16 Lab Sample ID: 280-126505-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00071	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0038	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.052		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00030	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00054	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.020		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0098		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.068		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-16 (Continued)
Lab Sample ID: 280-126505-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.4		0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: MW-17
Lab Sample ID: 280-126505-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0041	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.043		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.0010		0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00033	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0057	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0064		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00028	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Lithium	0.040		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	1.1		0.50	0.17	mg/L	1		9056A	Total/NA

Client Sample ID: MW-14EB
Lab Sample ID: 280-126505-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Thallium	0.00036	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable

Client Sample ID: MW-16D
Lab Sample ID: 280-126505-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00069	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0039	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.051		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00029	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00053	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Molybdenum	0.019		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0094		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00031	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Lithium	0.068		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Fluoride	2.3		0.50	0.17	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: HDR Inc
Job ID: 280-126505-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-126505-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-126505-1	MW-14	Water	07/23/19 09:43	07/23/19 13:15	
280-126505-2	MW-15	Water	07/23/19 09:12	07/23/19 13:15	
280-126505-3	MW-16	Water	07/22/19 13:20	07/23/19 13:15	
280-126505-4	MW-17	Water	07/22/19 14:58	07/23/19 13:15	
280-126505-5	MW-14EB	Water	07/23/19 10:00	07/23/19 13:15	
280-126505-6	MW-16D	Water	07/22/19 13:25	07/23/19 13:15	

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-14 | **Lab Sample ID: 280-126505-1**
Date Collected: 07/23/19 09:43 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:31	1
Arsenic	**0.0013**	**J**	0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:31	1
Barium	**0.050**		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:31	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:31	1
Cadmium	ND		0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:31	1
Cobalt	**0.00060**	**J**	0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:31	1
Chromium	**0.0066**		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:31	1
Molybdenum	**0.027**		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:31	1
Lead	**0.00046**	**J**	0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:31	1
Selenium	**0.0063**		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:31	1
Thallium	ND		0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:31	1
Lithium	**0.072**		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:31	1

Client Sample ID: MW-15 | **Lab Sample ID: 280-126505-2**
Date Collected: 07/23/19 09:12 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0014**	**J**	0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:33	1
Arsenic	**0.0022**	**J**	0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:33	1
Barium	**0.043**		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:33	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:33	1
Cadmium	ND		0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:33	1
Cobalt	**0.0021**		0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:33	1
Chromium	**0.0043**		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:33	1
Molybdenum	**0.021**		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:33	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:33	1
Selenium	**0.036**		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:33	1
Thallium	ND		0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:33	1
Lithium	**0.090**		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:33	1

Client Sample ID: MW-16 | **Lab Sample ID: 280-126505-3**
Date Collected: 07/22/19 13:20 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00071**	**J**	0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:36	1
Arsenic	**0.0038**	**J**	0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:36	1
Barium	**0.052**		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:36	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:36	1
Cadmium	**0.00030**	**J**	0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:36	1
Cobalt	**0.00054**	**J**	0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:36	1
Chromium	ND		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:36	1
Molybdenum	**0.020**		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:36	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:36	1
Selenium	**0.0098**		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:36	1
Thallium	ND		0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:36	1
Lithium	**0.068**		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:36	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-17
Lab Sample ID: 280-126505-4
Date Collected: 07/22/19 14:58
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:38	1
Arsenic	**0.0041**	**J**	0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:38	1
Barium	**0.043**		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:38	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:38	1
Cadmium	**0.0010**		0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:38	1
Cobalt	**0.00033**	**J**	0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:38	1
Chromium	ND		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:38	1
Molybdenum	**0.0057**	**J**	0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:38	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:38	1
Selenium	**0.0064**		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:38	1
Thallium	**0.00028**	**J**	0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:38	1
Lithium	**0.040**		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:38	1

Client Sample ID: MW-14EB
Lab Sample ID: 280-126505-5
Date Collected: 07/23/19 10:00
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:41	1
Arsenic	ND		0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:41	1
Barium	ND		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:41	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:41	1
Cadmium	ND		0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:41	1
Cobalt	ND		0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:41	1
Chromium	ND		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:41	1
Molybdenum	ND		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:41	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:41	1
Selenium	ND		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:41	1
Thallium	**0.00036**	**J**	0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:41	1
Lithium	ND		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:41	1

Client Sample ID: MW-16D
Lab Sample ID: 280-126505-6
Date Collected: 07/22/19 13:25
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00069**	**J**	0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 12:43	1
Arsenic	**0.0039**	**J**	0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 12:43	1
Barium	**0.051**		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 12:43	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 12:43	1
Cadmium	**0.00029**	**J**	0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 12:43	1
Cobalt	**0.00053**	**J**	0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 12:43	1
Chromium	ND		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 12:43	1
Molybdenum	**0.019**		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 12:43	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 12:43	1
Selenium	**0.0094**		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 12:43	1
Thallium	**0.00031**	**J**	0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 12:43	1
Lithium	**0.068**		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 12:43	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 07/23/19 09:43
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:25	1

Client Sample ID: MW-15
Date Collected: 07/23/19 09:12
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:27	1

Client Sample ID: MW-16
Date Collected: 07/22/19 13:20
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:33	1

Client Sample ID: MW-17
Date Collected: 07/22/19 14:58
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:35	1

Client Sample ID: MW-14EB
Date Collected: 07/23/19 10:00
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:37	1

Client Sample ID: MW-16D
Date Collected: 07/22/19 13:25
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 17:39	1

General Chemistry

Client Sample ID: MW-14
Date Collected: 07/23/19 09:43
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.0**		0.50	0.17	mg/L			08/10/19 01:18	1

Client Sample ID: MW-15
Date Collected: 07/23/19 09:12
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**		0.50	0.17	mg/L			08/10/19 02:28	1

Client Sample ID: MW-16
Date Collected: 07/22/19 13:20
Date Received: 07/23/19 13:15
Lab Sample ID: 280-126505-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.4**		0.50	0.17	mg/L			08/10/19 03:20	1

General Chemistry

Client Sample ID: MW-17 | **Lab Sample ID: 280-126505-4**
Date Collected: 07/22/19 14:58 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**1.1**		0.50	0.17	mg/L			08/10/19 03:38	1

Client Sample ID: MW-14EB | **Lab Sample ID: 280-126505-5**
Date Collected: 07/23/19 10:00 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			08/10/19 03:55	1

Client Sample ID: MW-16D | **Lab Sample ID: 280-126505-6**
Date Collected: 07/22/19 13:25 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	**2.3**		0.50	0.17	mg/L			08/10/19 04:12	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14 | **Lab Sample ID: 280-126505-1**
Date Collected: 07/23/19 09:43 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0635	U	0.104	0.104	1.00	0.181	pCi/L	07/26/19 09:24	09/10/19 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.8*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:27*	*1*

Client Sample ID: MW-15 | **Lab Sample ID: 280-126505-2**
Date Collected: 07/23/19 09:12 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0781	U	0.103	0.103	1.00	0.172	pCi/L	07/26/19 09:24	09/10/19 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*83.6*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:27*	*1*

Client Sample ID: MW-16 | **Lab Sample ID: 280-126505-3**
Date Collected: 07/22/19 13:20 | **Matrix: Water**
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.164**		0.115	0.116	1.00	0.160	pCi/L	07/26/19 09:24	09/10/19 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.7*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:27*	*1*

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-17
Date Collected: 07/22/19 14:58
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.183**		0.119	0.121	1.00	0.159	pCi/L	07/26/19 09:24	09/10/19 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.9*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:27*	*1*

Client Sample ID: MW-14EB
Date Collected: 07/23/19 10:00
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0177	U	0.0905	0.0905	1.00	0.187	pCi/L	07/26/19 09:24	09/10/19 12:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.9*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:28*	*1*

Client Sample ID: MW-16D
Date Collected: 07/22/19 13:25
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00808	U	0.100	0.100	1.00	0.202	pCi/L	07/26/19 09:24	09/10/19 12:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*74.9*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:28*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 07/23/19 09:43
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.811**		0.405	0.412	1.00	0.609	pCi/L	07/26/19 10:02	09/06/19 16:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.8*		*40 - 110*	*07/26/19 10:02*	*09/06/19 16:19*	*1*
Y Carrier	*81.9*		*40 - 110*	*07/26/19 10:02*	*09/06/19 16:19*	*1*

Client Sample ID: MW-15
Date Collected: 07/23/19 09:12
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.685**		0.350	0.356	1.00	0.524	pCi/L	07/26/19 10:02	09/06/19 16:37	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	83.6		40 - 110	07/26/19 10:02	09/06/19 16:37	1
Y Carrier	80.7		40 - 110	07/26/19 10:02	09/06/19 16:37	1

Client Sample ID: MW-16
Date Collected: 07/22/19 13:20
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.05**		0.356	0.369	1.00	0.473	pCi/L	07/26/19 10:02	09/06/19 16:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	77.7		40 - 110	07/26/19 10:02	09/06/19 16:37	1
Y Carrier	86.0		40 - 110	07/26/19 10:02	09/06/19 16:37	1

Client Sample ID: MW-17
Date Collected: 07/22/19 14:58
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.452**		0.279	0.282	1.00	0.424	pCi/L	07/26/19 10:02	09/06/19 16:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.9		40 - 110	07/26/19 10:02	09/06/19 16:37	1
Y Carrier	87.5		40 - 110	07/26/19 10:02	09/06/19 16:37	1

Client Sample ID: MW-14EB
Date Collected: 07/23/19 10:00
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.225	U	0.331	0.332	1.00	0.554	pCi/L	07/26/19 10:02	09/06/19 16:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.9		40 - 110	07/26/19 10:02	09/06/19 16:37	1
Y Carrier	81.5		40 - 110	07/26/19 10:02	09/06/19 16:37	1

Client Sample ID: MW-16D
Date Collected: 07/22/19 13:25
Date Received: 07/23/19 13:15

Lab Sample ID: 280-126505-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.05**		0.390	0.401	1.00	0.543	pCi/L	07/26/19 10:02	09/06/19 16:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	74.9		40 - 110	07/26/19 10:02	09/06/19 16:38	1
Y Carrier	86.0		40 - 110	07/26/19 10:02	09/06/19 16:38	1

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

Client Sample ID: MW-14
Lab Sample ID: 280-126505-1
Date Collected: 07/23/19 09:43
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.874**		0.418	0.425	5.00	0.609	pCi/L		09/11/19 08:04	1

Client Sample ID: MW-15
Lab Sample ID: 280-126505-2
Date Collected: 07/23/19 09:12
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.763**		0.365	0.371	5.00	0.524	pCi/L		09/11/19 08:04	1

Client Sample ID: MW-16
Lab Sample ID: 280-126505-3
Date Collected: 07/22/19 13:20
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.22**		0.374	0.387	5.00	0.473	pCi/L		09/11/19 08:04	1

Client Sample ID: MW-17
Lab Sample ID: 280-126505-4
Date Collected: 07/22/19 14:58
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.635**		0.303	0.307	5.00	0.424	pCi/L		09/11/19 08:04	1

Client Sample ID: MW-14EB
Lab Sample ID: 280-126505-5
Date Collected: 07/23/19 10:00
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.207	U	0.343	0.344	5.00	0.554	pCi/L		09/11/19 08:04	1

Client Sample ID: MW-16D
Lab Sample ID: 280-126505-6
Date Collected: 07/22/19 13:25
Matrix: Water
Date Received: 07/23/19 13:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.04**		0.403	0.413	5.00	0.543	pCi/L		09/11/19 08:04	1

QC Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-126505-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-393302/1-A
Matrix: Water
Analysis Batch: 393702

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 393302

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/29/19 14:00	07/30/19 11:34	1
Arsenic	ND		0.0050	0.00075	mg/L		07/29/19 14:00	07/30/19 11:34	1
Barium	ND		0.0050	0.0022	mg/L		07/29/19 14:00	07/30/19 11:34	1
Beryllium	ND		0.0010	0.00031	mg/L		07/29/19 14:00	07/30/19 11:34	1
Cadmium	ND		0.0010	0.00021	mg/L		07/29/19 14:00	07/30/19 11:34	1
Cobalt	ND		0.0010	0.00019	mg/L		07/29/19 14:00	07/30/19 11:34	1
Chromium	ND		0.0020	0.00098	mg/L		07/29/19 14:00	07/30/19 11:34	1
Molybdenum	ND		0.010	0.0011	mg/L		07/29/19 14:00	07/30/19 11:34	1
Lead	ND		0.0010	0.00045	mg/L		07/29/19 14:00	07/30/19 11:34	1
Selenium	ND		0.0050	0.00089	mg/L		07/29/19 14:00	07/30/19 11:34	1
Thallium	ND		0.0010	0.00020	mg/L		07/29/19 14:00	07/30/19 11:34	1
Lithium	ND		0.0080	0.0017	mg/L		07/29/19 14:00	07/30/19 11:34	1

Lab Sample ID: LCS 240-393302/2-A
Matrix: Water
Analysis Batch: 393702

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 393302

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.103		mg/L		103	80 - 120
Arsenic	1.00	0.981		mg/L		98	80 - 120
Barium	1.00	1.07		mg/L		107	80 - 120
Beryllium	0.500	0.485		mg/L		97	80 - 120
Cadmium	0.500	0.507		mg/L		101	80 - 120
Cobalt	0.500	0.504		mg/L		101	80 - 120
Chromium	0.500	0.504		mg/L		101	80 - 120
Molybdenum	0.500	0.505		mg/L		101	80 - 120
Lead	0.500	0.549		mg/L		110	80 - 120
Selenium	1.00	0.895		mg/L		90	80 - 120
Thallium	1.00	1.04		mg/L		104	80 - 120
Lithium	0.500	0.485		mg/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-393307/1-A
Matrix: Water
Analysis Batch: 393486

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 393307

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/29/19 12:00	07/29/19 16:38	1

Lab Sample ID: LCS 240-393307/2-A
Matrix: Water
Analysis Batch: 393486

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 393307

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.37		ug/L		107	80 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-467139/47 **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.17	mg/L			08/10/19 01:01	1

Lab Sample ID: LCS 280-467139/45 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	5.00	4.84		mg/L		97	90 - 110

Lab Sample ID: LCSD 280-467139/46 **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	5.00	5.03		mg/L		101	90 - 110	4	10

Lab Sample ID: MRL 280-467139/3 **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.500	0.529		mg/L		106	50 - 150

Lab Sample ID: 280-126505-1 MS **Client Sample ID: MW-14**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.0		5.00	7.24		mg/L		104	80 - 120

Lab Sample ID: 280-126505-1 MSD **Client Sample ID: MW-14**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	2.0		5.00	7.14		mg/L		102	80 - 120	1	20

Lab Sample ID: 280-126505-1 DU **Client Sample ID: MW-14**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 467139

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Fluoride	2.0		1.97		mg/L		3	15

Client: HDR Inc
Job ID: 280-126505-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-436665/11-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 442559
Prep Batch: 436665

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.04226	U	0.0905	0.0906	1.00	0.194	pCi/L	07/26/19 09:24	09/10/19 12:28	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.7*		*40 - 110*	*07/26/19 09:24*	*09/10/19 12:28*	*1*

Lab Sample ID: LCS 160-436665/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 442562
Prep Batch: 436665

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	9.291		1.04	1.00	0.177	pCi/L	82	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*90.1*		*40 - 110*

Lab Sample ID: LCSD 160-436665/2-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 442562
Prep Batch: 436665

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	10.00		1.12	1.00	0.182	pCi/L	88	75 - 125	0.33	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.5*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-436668/11-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 441902
Prep Batch: 436668

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.08396	U	0.273	0.273	1.00	0.473	pCi/L	07/26/19 10:02	09/06/19 16:38	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.7*		*40 - 110*	*07/26/19 10:02*	*09/06/19 16:38*	*1*
Y Carrier	*84.5*		*40 - 110*	*07/26/19 10:02*	*09/06/19 16:38*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-436668/1-A
Matrix: Water
Analysis Batch: 441882

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 436668

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.61	11.04		1.30	1.00	0.501	pCi/L	115	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*90.1*		*40 - 110*
Y Carrier	*77.0*		*40 - 110*

Lab Sample ID: LCSD 160-436668/2-A
Matrix: Water
Analysis Batch: 441882

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 436668

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.61	10.97		1.31	1.00	0.515	pCi/L	114	75 - 125	0.03	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*82.5*		*40 - 110*
Y Carrier	*77.4*		*40 - 110*

Metals

Prep Batch: 393302

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total Recoverable	Water	3005A	
280-126505-2	MW-15	Total Recoverable	Water	3005A	
280-126505-3	MW-16	Total Recoverable	Water	3005A	
280-126505-4	MW-17	Total Recoverable	Water	3005A	
280-126505-5	MW-14EB	Total Recoverable	Water	3005A	
280-126505-6	MW-16D	Total Recoverable	Water	3005A	
MB 240-393302/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-393302/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 393307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total/NA	Water	7470A	
280-126505-2	MW-15	Total/NA	Water	7470A	
280-126505-3	MW-16	Total/NA	Water	7470A	
280-126505-4	MW-17	Total/NA	Water	7470A	
280-126505-5	MW-14EB	Total/NA	Water	7470A	
280-126505-6	MW-16D	Total/NA	Water	7470A	
MB 240-393307/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-393307/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 393486

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total/NA	Water	7470A	393307
280-126505-2	MW-15	Total/NA	Water	7470A	393307
280-126505-3	MW-16	Total/NA	Water	7470A	393307
280-126505-4	MW-17	Total/NA	Water	7470A	393307
280-126505-5	MW-14EB	Total/NA	Water	7470A	393307
280-126505-6	MW-16D	Total/NA	Water	7470A	393307
MB 240-393307/1-A	Method Blank	Total/NA	Water	7470A	393307
LCS 240-393307/2-A	Lab Control Sample	Total/NA	Water	7470A	393307

Analysis Batch: 393702

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total Recoverable	Water	6020A	393302
280-126505-2	MW-15	Total Recoverable	Water	6020A	393302
280-126505-3	MW-16	Total Recoverable	Water	6020A	393302
280-126505-4	MW-17	Total Recoverable	Water	6020A	393302
280-126505-5	MW-14EB	Total Recoverable	Water	6020A	393302
280-126505-6	MW-16D	Total Recoverable	Water	6020A	393302
MB 240-393302/1-A	Method Blank	Total Recoverable	Water	6020A	393302
LCS 240-393302/2-A	Lab Control Sample	Total Recoverable	Water	6020A	393302

General Chemistry

Analysis Batch: 467139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total/NA	Water	9056A	
280-126505-2	MW-15	Total/NA	Water	9056A	
280-126505-3	MW-16	Total/NA	Water	9056A	
280-126505-4	MW-17	Total/NA	Water	9056A	
280-126505-5	MW-14EB	Total/NA	Water	9056A	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

General Chemistry (Continued)

Analysis Batch: 467139 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-6	MW-16D	Total/NA	Water	9056A	
MB 280-467139/47	Method Blank	Total/NA	Water	9056A	
LCS 280-467139/45	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-467139/46	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-467139/3	Lab Control Sample	Total/NA	Water	9056A	
280-126505-1 MS	MW-14	Total/NA	Water	9056A	
280-126505-1 MSD	MW-14	Total/NA	Water	9056A	
280-126505-1 DU	MW-14	Total/NA	Water	9056A	

Rad

Prep Batch: 436665

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total/NA	Water	PrecSep-21	
280-126505-2	MW-15	Total/NA	Water	PrecSep-21	
280-126505-3	MW-16	Total/NA	Water	PrecSep-21	
280-126505-4	MW-17	Total/NA	Water	PrecSep-21	
280-126505-5	MW-14EB	Total/NA	Water	PrecSep-21	
280-126505-6	MW-16D	Total/NA	Water	PrecSep-21	
MB 160-436665/11-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-436665/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-436665/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 436668

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-126505-1	MW-14	Total/NA	Water	PrecSep_0	
280-126505-2	MW-15	Total/NA	Water	PrecSep_0	
280-126505-3	MW-16	Total/NA	Water	PrecSep_0	
280-126505-4	MW-17	Total/NA	Water	PrecSep_0	
280-126505-5	MW-14EB	Total/NA	Water	PrecSep_0	
280-126505-6	MW-16D	Total/NA	Water	PrecSep_0	
MB 160-436668/11-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-436668/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-436668/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: HDR Inc — Job ID: 280-126505-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 — Lab Sample ID: 280-126505-1

Date Collected: 07/23/19 09:43 — **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:31	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:25	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 01:18	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.50 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442562	09/10/19 12:27	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.50 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441882	09/06/19 16:19	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Client Sample ID: MW-15 — Lab Sample ID: 280-126505-2

Date Collected: 07/23/19 09:12 — **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:33	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:27	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 02:28	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.38 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442562	09/10/19 12:27	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.38 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441902	09/06/19 16:37	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Client Sample ID: MW-16 — Lab Sample ID: 280-126505-3

Date Collected: 07/22/19 13:20 — **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:36	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:33	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 03:20	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.45 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442562	09/10/19 12:27	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.45 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441902	09/06/19 16:37	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Client Sample ID: MW-17 Lab Sample ID: 280-126505-4

Date Collected: 07/22/19 14:58 **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:38	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:35	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 03:38	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.54 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442562	09/10/19 12:27	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.54 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441902	09/06/19 16:37	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Client Sample ID: MW-14EB Lab Sample ID: 280-126505-5

Date Collected: 07/23/19 10:00 **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:41	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:37	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 03:55	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.67 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442562	09/10/19 12:28	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.67 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441902	09/06/19 16:37	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Client Sample ID: MW-16D Lab Sample ID: 280-126505-6

Date Collected: 07/22/19 13:25 **Matrix: Water**
Date Received: 07/23/19 13:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	393302	07/29/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			393702	07/30/19 12:43	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	393307	07/29/19 12:00	MRL	TAL CAN
Total/NA	Analysis	7470A		1			393486	07/29/19 17:39	DTN	TAL CAN
Total/NA	Analysis	9056A		1	5 mL	5 mL	467139	08/10/19 04:12	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.07 mL	1.0 g	436665	07/26/19 09:24	KAW	TAL SL
Total/NA	Analysis	9315		1			442559	09/10/19 12:28	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.07 mL	1.0 g	436668	07/26/19 10:02	KAW	TAL SL
Total/NA	Analysis	9320		1			441902	09/06/19 16:38	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			442649	09/11/19 08:04	SMP	TAL SL

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-126505-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025	01-08-20

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
California	State Program	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Connecticut	State Program	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Georgia	State Program	N/A	02-23-20
Illinois	NELAP	200004	07-31-20
Iowa	State Program	421	06-01-21
Kansas	NELAP	E-10336	04-30-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State Program	58	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Kentucky (WW)	State Program	98016	12-31-19
Minnesota	NELAP	039-999-348	12-31-19 *
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
Nevada	State Program	OH00048	07-31-19
New Jersey	NELAP	OH001	06-30-20
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Ohio VAP	State Program	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-19-11	08-31-20
USDA	Federal	P330-16-00404	12-28-19
Virginia	NELAP	460175	09-14-19 *
Virginia	NELAP	010101	09-14-19
Washington	State	C971	01-12-20
Washington	State Program	C971	01-12-20 *
West Virginia DEP	State	210	12-31-19
West Virginia DEP	State Program	210	12-31-19

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

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	DoD	L2305	04-06-22
ANAB	DOE	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
Arizona	State Program	AZ0813	12-08-19
California	State	2886	06-30-20
California	State Program	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Connecticut	State Program	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
Florida	NELAP	E87689	06-30-20
Hawaii	State Program	NA	06-30-20
Illinois	NELAP	200023	11-30-19
Illinois	NELAP	004553	11-30-19
Iowa	State Program	373	12-01-20
Kansas	NELAP	E-10236	10-31-19
Kentucky (DW)	State	KY90125	12-31-19
Kentucky (DW)	State Program	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	NELAP	LA011	12-31-19
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
Maryland	State Program	310	09-30-20
Michigan	State Program	9005	06-30-20
Missouri	State	780	06-30-22
Missouri	State Program	780	06-30-20
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	03-31-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
North Dakota	State Program	R207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Oklahoma	State Program	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State Program	85002001	06-30-20
Texas	NELAP	T104704193-19-14	07-31-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	Federal	058448	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	Federal	P330-17-0028	02-02-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	460230	06-14-20
Virginia	NELAP	10310	06-14-20

Laboratory: Eurofins TestAmerica, St. Louis (Continued)

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

Authority	Program	Identification Number	Expiration Date
Washington	State Program	C592	08-30-19 *
West Virginia DEP	State Program	381	08-31-19 *

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

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

Denver #280

eurofins Environment Testing TestAmerica

Client Information	Sampler: Austin Morgan	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-90051-28124.1
Client Contact: Anna Lundin	Phone: 832-418-3307	E-Mail: darlene.bandy@testamericainc.com		Page: Page 1 of 1
Company: HDR Inc				Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			
City: Englewood	TAT Requested (days):			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #: DEN-018			
Email: anna.lundin@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Colorado	SSOW#:			

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	App IV - Total Metals	Ra226/Ra228 Combined	Anions	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
~~MW-13~~				Water							Am
MW-14	7-23-19	0943	G	Water	N	N	X	X	X	4	Contact Molly Reeves
MW-15	7-23-19	0912	G	Water	N	N	X	X	X	4	with questions:
MW-16	7-22-19	1320	G	Water	N	N	X	X	X	4	734-263-7138
MW-17	7-22-19	1458	G	Water	N	N	X	X	X	4	
~~EB~~ Am MW-14 EB	7-23-19	1000	G	Water	N	N	X	X	X	4	
~~DUP~~ Am MW-16D	7-22-19	1325	G	Water	N	N	X	X	X	4	

280-126505 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: [signature]	Date/Time: 7-23-19 1315	Company: HDR	Received by: [signature]	Date/Time: 7-23-19 1315	Company: TA-DEN
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.6, to, IR8, CAP 7-23-19

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-492340.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-126505-1
Address: 13715 Rider Trail North,	Due Date Requested: 8/21/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method 3 of 3	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14 (280-126505-1)	7/23/19	09:43 Mountain		Water			X	X	X	2	
MW-15 (280-126505-2)	7/23/19	09:12 Mountain		Water			X	X	X	2	
MW-16 (280-126505-3)	7/22/19	13:20 Mountain		Water			X	X	X	2	
MW-17 (280-126505-4)	7/22/19	14:58 Mountain		Water			X	X	X	2	
MW-14EB (280-126505-5)	7/23/19	10:00 Mountain		Water			X	X	X	2	
MW-16D (280-126505-6)	7/22/19	13:25 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:		Method of Shipment:	
Relinquished by: Ale Nielsen	Date/Time: 7/24/19 1521	Company: TA Den	Received by: Michael Heun	Date/Time: 7-25-19 05:30	Company: TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

18.6/18.7

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-492339.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-126505-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 8/16/2019			
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

543

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 12 T. Metals (w/collision cell) - ApplV	7470A/7470A_Prep Mercury	Total Number of containers	Special Instructions/Note:
				Preservation Code:						
MW-14 (280-126505-1)	7/23/19	09:43 Mountain		Water			X	X	1	Use Collision Cell
MW-15 (280-126505-2)	7/23/19	09:12 Mountain		Water			X	X	1	Use Collision Cell
MW-16 (280-126505-3)	7/22/19	13:20 Mountain		Water			X	X	1	Use Collision Cell
MW-17 (280-126505-4)	7/22/19	14:58 Mountain		Water			X	X	1	Use Collision Cell
MW-14EB (280-126505-5)	7/23/19	10:00 Mountain		Water			X	X	1	Use Collision Cell
MW-16D (280-126505-6)	7/22/19	13:25 Mountain		Water			X	X	1	Use Collision Cell

800

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:		
Relinquished by: A Nielsen	Date/Time: 7/24/19 1515	Company: TADen	Received by: Terry Burns	Date/Time: 7/25/19 0930	Company: ETAC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Login # : ______________
Canton Facility

Client TA Denver Site Name ______________ Cooler unpacked by:

Cooler Received on 7/25/19 Opened on 7/26/19 Terry Burns

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other ______

Receipt After-hours: Drop-off Date/Time ______________ Storage Location ______________

TestAmerica Cooler # TA Foam Box Client Cooler Box Other ______________

Packing material used: Bubble Wrap Foam Plastic Bag None Other ______________

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-8 (CF **+0.1** °C) Observed Cooler Temp. 18.6 °C Corrected Cooler Temp. 18.7 °C
   IR GUN #36 (CF **+0.6**°C) Observed Cooler Temp. ______ °C Corrected Cooler Temp. ______ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   - Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   - Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA — pH Strip Lot# **HC984738**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ______________ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ______________ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ______________ Date ______________ by ______________ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

____

18. SAMPLE CONDITION

Sample(s) ______________ were received after the recommended holding time had expired.

Sample(s) ______________ were received in a broken container.

Sample(s) ______________ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ______________ were further preserved in the laboratory.

Time preserved: ______________ Preservative(s) added/Lot number(s): ______________

VOA Sample Preservation - Date/Time VOAs Frozen: ______________

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-126505-1

Login Number: 126505
List Number: 1
Creator: Zimmerman, Steven M

List Source: Eurofins TestAmerica, Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-126505-1

Login Number: 126505
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 07/25/19 10:29 AM

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	18.0
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	

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Method: 9315 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
		Ba Carrier
Lab Sample ID	Client Sample ID	(40-110)
280-126505-1	MW-14	76.8
280-126505-2	MW-15	83.6
280-126505-3	MW-16	77.7
280-126505-4	MW-17	81.9
280-126505-5	MW-14EB	85.9
280-126505-6	MW-16D	74.9
LCS 160-436665/1-A	Lab Control Sample	90.1
LCSD 160-436665/2-A	Lab Control Sample Dup	82.5
MB 160-436665/11-A	Method Blank	90.7

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
		Ba Carrier	Y Carrier
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
280-126505-1	MW-14	76.8	81.9
280-126505-2	MW-15	83.6	80.7
280-126505-3	MW-16	77.7	86.0
280-126505-4	MW-17	81.9	87.5
280-126505-5	MW-14EB	85.9	81.5
280-126505-6	MW-16D	74.9	86.0
LCS 160-436668/1-A	Lab Control Sample	90.1	77.0
LCSD 160-436668/2-A	Lab Control Sample Dup	82.5	77.4
MB 160-436668/11-A	Method Blank	90.7	84.5

Tracer/Carrier Legend

Ba Carrier = Ba Carrier
Y Carrier = Y Carrier

eurofins

Environment Testing
TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-130046-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
12/5/2019 11:30:06 AM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

LINKS

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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

Client: HDR Inc

Job ID: 280-130046-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Qualifiers

Metals

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

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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)

Job ID: 280-130046-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-130046-1

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

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

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

RECEIPT
The samples were received on 10/25/2019; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was C.

The samples were received on 10/25/2019 8:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.8º C and 2.1º C.

Receipt Exceptions

Beryllium was not logged for the requested Metals analysis per client instruction on the COC. Mercury was also not logged per this instruction note.

TOTAL RECOVERABLE METALS
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/30/2019 and analyzed on 11/01/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 10/30/2019 and analyzed on 10/31/2019.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. Refer to the QC report for details.

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

TOTAL DISSOLVED SOLIDS
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The

Job ID: 280-130046-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

samples were analyzed on 10/28/2019.

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

CORROSIVITY (PH)
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 11/13/2019 and 11/14/2019.

The following sample pH did not equilibrate to 0.05 pH units after three measurements: MW-16EB (280-130046-6). This was observed in a previous batch thus the sample was not rerun.

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

ANIONS (28 DAYS)
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 11/19/2019.

Samples MW-15 (280-130046-1)[5X], MW-13 (280-130046-2)[5X], MW-16 (280-130046-3)[5X], MW-17 (280-130046-4)[5X], MW-14 (280-130046-5)[5X] and MW-16FD (280-130046-7)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample was prepared and loaded on the instrument within hold time, but was not analyzed within hold due to the length of the batch: MW-15 (280-130046-1). It is noted that the sample was analyzed within 3½ hours after the hold time had expired.

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

RADIUM-226 (GFPC)
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 11/08/2019 and analyzed on 12/02/2019.

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-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6), MW-16FD (280-130046-7), (LCS 160-449610/1-A) and (MB 160-449610/11-A)

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

RADIUM-228
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 11/08/2019 and analyzed on 11/14/2019.

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-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6), MW-16FD (280-130046-7), (LCS 160-449610/1-A) and (MB 160-449610/11-A)

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

Job ID: 280-130046-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-15 (280-130046-1), MW-13 (280-130046-2), MW-16 (280-130046-3), MW-17 (280-130046-4), MW-14 (280-130046-5), MW-16EB (280-130046-6) and MW-16FD (280-130046-7) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 12/04/2019.

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

Detection Summary

Client: HDR Inc — Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-15 — Lab Sample ID: 280-130046-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3.7		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.0019	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0017	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.036		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	190		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0051		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0093		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.090		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.071		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.036		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00044	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	310	H	15	5.1	mg/L	5		9056A	Total/NA
Fluoride	1.5	H	0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	660	H	25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1800		20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-13 — Lab Sample ID: 280-130046-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.46		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.073		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	130		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0016	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00046	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.037		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0033	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00048	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	150		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	0.86		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	180		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	880		20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-16   Lab Sample ID: 280-130046-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.64		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00081	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0032	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.036		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	140		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0016	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00028	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.058		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.018		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0085		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	240		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	2.1		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	360		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1200		20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17   Lab Sample ID: 280-130046-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.67		0.10	0.023	mg/L	1		6010C	Total Recoverable
Arsenic	0.0041	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.029		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00081	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Calcium	74		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.00025	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.035		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0061	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0057		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.0	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	88		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	220		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	630		20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc — Job ID: 280-130046-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-14 — Lab Sample ID: 280-130046-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.039		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	160		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0014	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00027	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.068		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.022		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0060		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	290		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	1.8		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	260		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1200		20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-16EB — Lab Sample ID: 280-130046-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	6.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

Client Sample ID: MW-16FD — Lab Sample ID: 280-130046-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.62		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00067	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0031	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.033		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	130		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0014	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00026	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.055		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.017		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0076		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	260		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	2.1		0.50	0.17	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-16FD (Continued)

Lab Sample ID: 280-130046-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	410		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1200		20	9.4	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-130046-1	MW-15	Water	10/21/19 15:00	10/25/19 08:15	
280-130046-2	MW-13	Water	10/22/19 09:25	10/25/19 08:15	
280-130046-3	MW-16	Water	10/22/19 11:20	10/25/19 08:15	
280-130046-4	MW-17	Water	10/22/19 14:40	10/25/19 08:15	
280-130046-5	MW-14	Water	10/22/19 15:30	10/25/19 08:15	
280-130046-6	MW-16EB	Water	10/22/19 11:20	10/25/19 08:15	
280-130046-7	MW-16FD	Water	10/22/19 11:20	10/25/19 08:15	

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-15 | **Lab Sample ID: 280-130046-1**
Date Collected: 10/21/19 15:00 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3.7		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:22	1

Client Sample ID: MW-13 | **Lab Sample ID: 280-130046-2**
Date Collected: 10/22/19 09:25 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.46		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:26	1

Client Sample ID: MW-16 | **Lab Sample ID: 280-130046-3**
Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.64		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:31	1

Client Sample ID: MW-17 | **Lab Sample ID: 280-130046-4**
Date Collected: 10/22/19 14:40 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.67		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:35	1

Client Sample ID: MW-14 | **Lab Sample ID: 280-130046-5**
Date Collected: 10/22/19 15:30 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:40	1

Client Sample ID: MW-16EB | **Lab Sample ID: 280-130046-6**
Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:52	1

Client Sample ID: MW-16FD | **Lab Sample ID: 280-130046-7**
Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.62		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 14:57	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-15 | **Lab Sample ID: 280-130046-1**
Date Collected: 10/21/19 15:00 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0019	J	0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:33	1
Arsenic	0.0017	J	0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:33	1
Barium	0.036		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:33	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:33	1
Calcium	190		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:33	1
Chromium	0.0051		0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:33	1
Cobalt	0.0093		0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:33	1

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

Client Sample ID: MW-15
Lab Sample ID: 280-130046-1
Date Collected: 10/21/19 15:00
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:33	1
Lithium	**0.090**		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:33	1
Molybdenum	**0.071**		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:33	1
Selenium	**0.036**		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:33	1
Thallium	**0.00044**	**J**	0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:33	1

Client Sample ID: MW-13
Lab Sample ID: 280-130046-2
Date Collected: 10/22/19 09:25
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:43	1
Arsenic	ND		0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:43	1
Barium	**0.073**		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:43	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:43	1
Calcium	**130**		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:43	1
Chromium	**0.0016**	**J**	0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:43	1
Cobalt	**0.00046**	**J**	0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:43	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:43	1
Lithium	**0.037**		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:43	1
Molybdenum	**0.0033**	**J**	0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:43	1
Selenium	**0.0033**	**J**	0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:43	1
Thallium	**0.00048**	**J**	0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:43	1

Client Sample ID: MW-16
Lab Sample ID: 280-130046-3
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00081**	**J**	0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:46	1
Arsenic	**0.0032**	**J**	0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:46	1
Barium	**0.036**		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:46	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:46	1
Calcium	**140**		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:46	1
Chromium	**0.0016**	**J**	0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:46	1
Cobalt	**0.00028**	**J**	0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:46	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:46	1
Lithium	**0.058**		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:46	1
Molybdenum	**0.018**		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:46	1
Selenium	**0.0085**		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:46	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:46	1

Client Sample ID: MW-17
Lab Sample ID: 280-130046-4
Date Collected: 10/22/19 14:40
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:53	1
Arsenic	**0.0041**	**J**	0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:53	1
Barium	**0.029**		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:53	1
Cadmium	**0.00081**	**J**	0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:53	1
Calcium	**74**		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:53	1
Chromium	ND		0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:53	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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

Client Sample ID: MW-17
Date Collected: 10/22/19 14:40
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	**0.00025**	**J**	0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:53	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:53	1
Lithium	**0.035**		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:53	1
Molybdenum	**0.0061**	**J**	0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:53	1
Selenium	**0.0057**		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:53	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:53	1

Client Sample ID: MW-14
Date Collected: 10/22/19 15:30
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:55	1
Arsenic	ND		0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:55	1
Barium	**0.039**		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:55	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:55	1
Calcium	**160**		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:55	1
Chromium	**0.0014**	**J**	0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:55	1
Cobalt	**0.00027**	**J**	0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:55	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:55	1
Lithium	**0.068**		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:55	1
Molybdenum	**0.022**		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:55	1
Selenium	**0.0060**		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:55	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:55	1

Client Sample ID: MW-16EB
Date Collected: 10/22/19 11:20
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:58	1
Arsenic	ND		0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:58	1
Barium	ND		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:58	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:58	1
Calcium	ND		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:58	1
Chromium	ND		0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:58	1
Cobalt	ND		0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:58	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:58	1
Lithium	ND		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:58	1
Molybdenum	ND		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:58	1
Selenium	ND		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:58	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:58	1

Client Sample ID: MW-16FD
Date Collected: 10/22/19 11:20
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00067**	**J**	0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 15:00	1
Arsenic	**0.0031**	**J**	0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 15:00	1
Barium	**0.033**		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 15:00	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 15:00	1
Calcium	**130**		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 15:00	1

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

Client Sample ID: MW-16FD
Lab Sample ID: 280-130046-7
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.0014	J	0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 15:00	1
Cobalt	0.00026	J	0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 15:00	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 15:00	1
Lithium	0.055		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 15:00	1
Molybdenum	0.017		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 15:00	1
Selenium	0.0076		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 15:00	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 15:00	1

General Chemistry

Client Sample ID: MW-15
Lab Sample ID: 280-130046-1
Date Collected: 10/21/19 15:00
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU			11/13/19 14:32	1
Temperature	22.7	HF	1.0	1.0	Degrees C			11/13/19 14:32	1
Chloride	310	H	15	5.1	mg/L			11/19/19 03:14	5
Fluoride	1.5	H	0.50	0.17	mg/L			11/19/19 02:57	1
Sulfate	660	H	25	5.2	mg/L			11/19/19 03:14	5
Total Dissolved Solids (TDS)	1800		20	9.4	mg/L			10/28/19 11:05	1

Client Sample ID: MW-13
Lab Sample ID: 280-130046-2
Date Collected: 10/22/19 09:25
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU			11/13/19 14:40	1
Temperature	22.3	HF	1.0	1.0	Degrees C			11/13/19 14:40	1
Chloride	150		3.0	1.0	mg/L			11/19/19 03:32	1
Fluoride	0.86		0.50	0.17	mg/L			11/19/19 03:32	1
Sulfate	180		25	5.2	mg/L			11/19/19 03:49	5
Total Dissolved Solids (TDS)	880		20	9.4	mg/L			10/28/19 11:05	1

Client Sample ID: MW-16
Lab Sample ID: 280-130046-3
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU			11/13/19 14:46	1
Temperature	22.3	HF	1.0	1.0	Degrees C			11/13/19 14:46	1
Chloride	240		15	5.1	mg/L			11/19/19 05:16	5
Fluoride	2.1		0.50	0.17	mg/L			11/19/19 04:59	1
Sulfate	360		25	5.2	mg/L			11/19/19 05:16	5
Total Dissolved Solids (TDS)	1200		20	9.4	mg/L			10/28/19 11:05	1

Client Sample ID: MW-17
Lab Sample ID: 280-130046-4
Date Collected: 10/22/19 14:40
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.0	HF	0.1	0.1	SU			11/13/19 14:51	1
Temperature	22.5	HF	1.0	1.0	Degrees C			11/13/19 14:51	1
Chloride	88		3.0	1.0	mg/L			11/19/19 05:34	1
Fluoride	1.2		0.50	0.17	mg/L			11/19/19 05:34	1

General Chemistry (Continued)

Client Sample ID: MW-17 **Lab Sample ID: 280-130046-4**
Date Collected: 10/22/19 14:40 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	**220**		25	5.2	mg/L			11/19/19 05:51	5
Total Dissolved Solids (TDS)	**630**		20	9.4	mg/L			10/28/19 11:05	1

Client Sample ID: MW-14 **Lab Sample ID: 280-130046-5**
Date Collected: 10/22/19 15:30 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.4**	**HF**	0.1	0.1	SU			11/13/19 14:56	1
Temperature	**22.8**	**HF**	1.0	1.0	Degrees C			11/13/19 14:56	1
Chloride	**290**		15	5.1	mg/L			11/19/19 06:26	5
Fluoride	**1.8**		0.50	0.17	mg/L			11/19/19 06:09	1
Sulfate	**260**		25	5.2	mg/L			11/19/19 06:26	5
Total Dissolved Solids (TDS)	**1200**		20	9.4	mg/L			10/28/19 11:05	1

Client Sample ID: MW-16EB **Lab Sample ID: 280-130046-6**
Date Collected: 10/22/19 11:20 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**6.6**	**HF**	0.1	0.1	SU			11/14/19 11:49	1
Temperature	**20.1**	**HF**	1.0	1.0	Degrees C			11/14/19 11:49	1
Chloride	ND		3.0	1.0	mg/L			11/19/19 04:06	1
Fluoride	ND		0.50	0.17	mg/L			11/19/19 04:06	1
Sulfate	ND		5.0	1.0	mg/L			11/19/19 04:06	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			10/28/19 11:05	1

Client Sample ID: MW-16FD **Lab Sample ID: 280-130046-7**
Date Collected: 10/22/19 11:20 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.4**	**HF**	0.1	0.1	SU			11/13/19 15:08	1
Temperature	**22.3**	**HF**	1.0	1.0	Degrees C			11/13/19 15:08	1
Chloride	**260**		15	5.1	mg/L			11/19/19 07:01	5
Fluoride	**2.1**		0.50	0.17	mg/L			11/19/19 06:43	1
Sulfate	**410**		25	5.2	mg/L			11/19/19 07:01	5
Total Dissolved Solids (TDS)	**1200**		20	9.4	mg/L			10/28/19 11:05	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-15 **Lab Sample ID: 280-130046-1**
Date Collected: 10/21/19 15:00 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0145	U	0.0781	0.0782	1.00	0.159	pCi/L	11/08/19 15:28	12/02/19 08:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.8*		*40 - 110*	*11/08/19 15:28*	*12/02/19 08:32*	*1*

Client: HDR Inc Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-13 **Lab Sample ID: 280-130046-2**
Date Collected: 10/22/19 09:25 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.264**		0.117	0.120	1.00	0.146	pCi/L	11/08/19 15:28	12/02/19 08:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.2*		*40 - 110*	*11/08/19 15:28*	*12/02/19 08:32*	*1*

Client Sample ID: MW-16 **Lab Sample ID: 280-130046-3**
Date Collected: 10/22/19 11:20 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0102	U	0.0732	0.0733	1.00	0.139	pCi/L	11/08/19 15:28	12/02/19 08:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.5*		*40 - 110*	*11/08/19 15:28*	*12/02/19 08:32*	*1*

Client Sample ID: MW-17 **Lab Sample ID: 280-130046-4**
Date Collected: 10/22/19 14:40 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0558	U	0.0723	0.0725	1.00	0.164	pCi/L	11/08/19 15:28	12/02/19 08:32	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*68.9*		*40 - 110*	*11/08/19 15:28*	*12/02/19 08:32*	*1*

Client Sample ID: MW-14 **Lab Sample ID: 280-130046-5**
Date Collected: 10/22/19 15:30 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.170**		0.103	0.104	1.00	0.141	pCi/L	11/08/19 15:28	12/02/19 08:33	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.3*		*40 - 110*	*11/08/19 15:28*	*12/02/19 08:33*	*1*

Client Sample ID: MW-16EB **Lab Sample ID: 280-130046-6**
Date Collected: 10/22/19 11:20 **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0475	U	0.0574	0.0576	1.00	0.135	pCi/L	11/08/19 15:28	12/02/19 10:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*76.6*		*40 - 110*	*11/08/19 15:28*	*12/02/19 10:41*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-16FD
Date Collected: 10/22/19 11:20
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0276	U	0.0749	0.0749	1.00	0.157	pCi/L	11/08/19 15:28	12/02/19 10:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*70.3*		*40 - 110*	*11/08/19 15:28*	*12/02/19 10:41*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-15
Date Collected: 10/21/19 15:00
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0932	U	0.336	0.336	1.00	0.584	pCi/L	11/08/19 15:55	11/14/19 18:21	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*71.8*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:21*	*1*
Y Carrier	*80.7*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:21*	*1*

Client Sample ID: MW-13
Date Collected: 10/22/19 09:25
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.273	U	0.319	0.320	1.00	0.527	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.2*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*83.7*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Client Sample ID: MW-16
Date Collected: 10/22/19 11:20
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.743**		0.354	0.361	1.00	0.520	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.5*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*78.9*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Client Sample ID: MW-17
Date Collected: 10/22/19 14:40
Date Received: 10/25/19 08:15

Lab Sample ID: 280-130046-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.991**		0.494	0.502	1.00	0.730	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Method: 9320 - Radium-228 (GFPC)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*68.9*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*64.3*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Client Sample ID: MW-14 | **Lab Sample ID: 280-130046-5**
Date Collected: 10/22/19 15:30 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.611**		0.356	0.361	1.00	0.536	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*76.3*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*72.5*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Client Sample ID: MW-16EB | **Lab Sample ID: 280-130046-6**
Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.517	U	0.355	0.358	1.00	0.550	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*76.6*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*72.9*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Client Sample ID: MW-16FD | **Lab Sample ID: 280-130046-7**
Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.149	U	0.323	0.324	1.00	0.601	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*70.3*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*80.7*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

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

Client Sample ID: MW-15 | **Lab Sample ID: 280-130046-1**
Date Collected: 10/21/19 15:00 | **Matrix: Water**
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0787	U	0.345	0.345	5.00	0.584	pCi/L		12/04/19 09:09	1

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

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

Client Sample ID: MW-13
Lab Sample ID: 280-130046-2
Date Collected: 10/22/19 09:25
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.537**		0.340	0.342	5.00	0.527	pCi/L		12/04/19 09:09	1

Client Sample ID: MW-16
Lab Sample ID: 280-130046-3
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.754**		0.361	0.368	5.00	0.520	pCi/L		12/04/19 09:09	1

Client Sample ID: MW-17
Lab Sample ID: 280-130046-4
Date Collected: 10/22/19 14:40
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.935**		0.499	0.507	5.00	0.730	pCi/L		12/04/19 09:09	1

Client Sample ID: MW-14
Lab Sample ID: 280-130046-5
Date Collected: 10/22/19 15:30
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.781**		0.371	0.376	5.00	0.536	pCi/L		12/04/19 09:09	1

Client Sample ID: MW-16EB
Lab Sample ID: 280-130046-6
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.469	U	0.360	0.363	5.00	0.550	pCi/L		12/04/19 09:09	1

Client Sample ID: MW-16FD
Lab Sample ID: 280-130046-7
Date Collected: 10/22/19 11:20
Matrix: Water
Date Received: 10/25/19 08:15

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.176	U	0.332	0.333	5.00	0.601	pCi/L		12/04/19 09:09	1

Client: HDR Inc Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-408320/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 408949 **Prep Batch: 408320**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		10/30/19 14:00	11/01/19 13:18	1

Lab Sample ID: LCS 240-408320/2-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 408949 **Prep Batch: 408320**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.04		mg/L		104	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-408320/1-A **Client Sample ID: Method Blank**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 408622 **Prep Batch: 408320**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/30/19 14:00	10/31/19 14:28	1
Arsenic	ND		0.0050	0.00075	mg/L		10/30/19 14:00	10/31/19 14:28	1
Barium	ND		0.0050	0.0022	mg/L		10/30/19 14:00	10/31/19 14:28	1
Cadmium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:28	1
Calcium	ND		1.0	0.58	mg/L		10/30/19 14:00	10/31/19 14:28	1
Chromium	ND		0.0020	0.00098	mg/L		10/30/19 14:00	10/31/19 14:28	1
Cobalt	ND		0.0010	0.00019	mg/L		10/30/19 14:00	10/31/19 14:28	1
Lead	ND		0.0010	0.00045	mg/L		10/30/19 14:00	10/31/19 14:28	1
Lithium	ND		0.0080	0.0017	mg/L		10/30/19 14:00	10/31/19 14:28	1
Molybdenum	ND		0.010	0.0011	mg/L		10/30/19 14:00	10/31/19 14:28	1
Selenium	ND		0.0050	0.00089	mg/L		10/30/19 14:00	10/31/19 14:28	1
Thallium	ND		0.0010	0.00020	mg/L		10/30/19 14:00	10/31/19 14:28	1

Lab Sample ID: LCS 240-408320/3-A **Client Sample ID: Lab Control Sample**
Matrix: Water **Prep Type: Total Recoverable**
Analysis Batch: 408622 **Prep Batch: 408320**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.104		mg/L		104	80 - 120
Arsenic	1.00	0.965		mg/L		97	80 - 120
Barium	1.00	1.00		mg/L		100	80 - 120
Cadmium	0.500	0.484		mg/L		97	80 - 120
Calcium	25.0	24.7		mg/L		99	80 - 120
Chromium	0.500	0.484		mg/L		97	80 - 120
Cobalt	0.500	0.490		mg/L		98	80 - 120
Lead	0.500	0.498		mg/L		100	80 - 120
Lithium	0.500	0.570		mg/L		114	80 - 120
Molybdenum	0.500	0.484		mg/L		97	80 - 120
Selenium	1.00	0.931		mg/L		93	80 - 120
Thallium	1.00	0.960		mg/L		96	80 - 120

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

Lab Sample ID: 280-130046-1 MS | **Client Sample ID: MW-15**
Matrix: Water | **Prep Type: Total Recoverable**
Analysis Batch: 408622 | **Prep Batch: 408320**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.0019	J	0.100	0.108		mg/L		106	75 - 125
Arsenic	0.0017	J	1.00	1.04		mg/L		104	75 - 125
Barium	0.036		1.00	1.06		mg/L		103	75 - 125
Cadmium	ND		0.500	0.466		mg/L		93	75 - 125
Calcium	190		25.0	212	4	mg/L		107	75 - 125
Chromium	0.0051		0.500	0.489		mg/L		97	75 - 125
Cobalt	0.0093		0.500	0.519		mg/L		102	75 - 125
Lead	ND		0.500	0.483		mg/L		97	75 - 125
Lithium	0.090		0.500	0.673		mg/L		117	75 - 125
Molybdenum	0.071		0.500	0.595		mg/L		105	75 - 125
Selenium	0.036		1.00	0.972		mg/L		94	75 - 125
Thallium	0.00044	J	1.00	0.921		mg/L		92	75 - 125

Lab Sample ID: 280-130046-1 MSD | **Client Sample ID: MW-15**
Matrix: Water | **Prep Type: Total Recoverable**
Analysis Batch: 408622 | **Prep Batch: 408320**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.0019	J	0.100	0.107		mg/L		105	75 - 125	1	20
Arsenic	0.0017	J	1.00	1.02		mg/L		102	75 - 125	2	20
Barium	0.036		1.00	1.04		mg/L		101	75 - 125	2	20
Cadmium	ND		0.500	0.463		mg/L		93	75 - 125	1	20
Calcium	190		25.0	206	4	mg/L		81	75 - 125	3	20
Chromium	0.0051		0.500	0.481		mg/L		95	75 - 125	2	20
Cobalt	0.0093		0.500	0.511		mg/L		100	75 - 125	2	20
Lead	ND		0.500	0.482		mg/L		96	75 - 125	0	20
Lithium	0.090		0.500	0.665		mg/L		115	75 - 125	1	20
Molybdenum	0.071		0.500	0.591		mg/L		104	75 - 125	1	20
Selenium	0.036		1.00	0.957		mg/L		92	75 - 125	2	20
Thallium	0.00044	J	1.00	0.923		mg/L		92	75 - 125	0	20

Method: 9040B - pH

Lab Sample ID: LCS 280-477561/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 477561

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.1		SU		101	99 - 101

Lab Sample ID: 280-130046-1 DU | **Client Sample ID: MW-15**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 477561

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.9	HF	7.9		SU		0.3	5
Temperature	22.7	HF	22.1		Degrees C		3	10

Method: 9040B - pH (Continued)

Lab Sample ID: LCS 280-477662/4
Matrix: Water
Analysis Batch: 477662

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.1		SU		101	99 - 101

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-478055/13
Matrix: Water
Analysis Batch: 478055

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			11/18/19 17:20	1
Fluoride	ND		0.50	0.17	mg/L			11/18/19 17:20	1
Sulfate	ND		5.0	1.0	mg/L			11/18/19 17:20	1

Lab Sample ID: LCS 280-478055/11
Matrix: Water
Analysis Batch: 478055

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.6		mg/L		100	90 - 110
Fluoride	5.00	5.21		mg/L		104	90 - 110
Sulfate	100	99.0		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-478055/12
Matrix: Water
Analysis Batch: 478055

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.7		mg/L		100	90 - 110	0	10
Fluoride	5.00	4.93		mg/L		99	90 - 110	5	10
Sulfate	100	98.8		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-478055/10
Matrix: Water
Analysis Batch: 478055

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.56		mg/L		91	50 - 150
Fluoride	0.500	0.487	J	mg/L		97	50 - 150
Sulfate	5.00	4.25	J	mg/L		85	50 - 150

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

Lab Sample ID: MB 280-475579/1
Matrix: Water
Analysis Batch: 475579

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 (TDS)	ND		10	4.7	mg/L			10/28/19 11:05	1

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

Lab Sample ID: LCS 280-475579/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 475579

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	494		mg/L		99	93 - 110

Lab Sample ID: LCSD 280-475579/3 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 475579

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	500	481		mg/L		96	93 - 110	3	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-449607/11-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452597 — **Prep Batch: 449607**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.004293	U	0.0703	0.0703	1.00	0.136	pCi/L	11/08/19 15:28	12/02/19 10:42	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.4*		*40 - 110*	*11/08/19 15:28*	*12/02/19 10:42*	*1*

Lab Sample ID: LCS 160-449607/1-A — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 452597 — **Prep Batch: 449607**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.3	11.21		1.16	1.00	0.136	pCi/L	99	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*74.9*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-449610/11-A — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 450352 — **Prep Batch: 449610**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.04944	U	0.301	0.302	1.00	0.547	pCi/L	11/08/19 15:55	11/14/19 18:22	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.4*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*
Y Carrier	*73.6*		*40 - 110*	*11/08/19 15:55*	*11/14/19 18:22*	*1*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCS 160-449610/1-A | **Client Sample ID: Lab Control Sample**

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

Analysis Batch: 450352 | **Prep Batch: 449610**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.40	10.67		1.29	1.00	0.557	pCi/L	114	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*74.9*		*40 - 110*
Y Carrier	*80.7*		*40 - 110*

Metals

Prep Batch: 408320

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total Recoverable	Water	3005A	
280-130046-2	MW-13	Total Recoverable	Water	3005A	
280-130046-3	MW-16	Total Recoverable	Water	3005A	
280-130046-4	MW-17	Total Recoverable	Water	3005A	
280-130046-5	MW-14	Total Recoverable	Water	3005A	
280-130046-6	MW-16EB	Total Recoverable	Water	3005A	
280-130046-7	MW-16FD	Total Recoverable	Water	3005A	
MB 240-408320/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-408320/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-408320/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-130046-1 MS	MW-15	Total Recoverable	Water	3005A	
280-130046-1 MSD	MW-15	Total Recoverable	Water	3005A	

Analysis Batch: 408622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total Recoverable	Water	6020A	408320
280-130046-2	MW-13	Total Recoverable	Water	6020A	408320
280-130046-3	MW-16	Total Recoverable	Water	6020A	408320
280-130046-4	MW-17	Total Recoverable	Water	6020A	408320
280-130046-5	MW-14	Total Recoverable	Water	6020A	408320
280-130046-6	MW-16EB	Total Recoverable	Water	6020A	408320
280-130046-7	MW-16FD	Total Recoverable	Water	6020A	408320
MB 240-408320/1-A	Method Blank	Total Recoverable	Water	6020A	408320
LCS 240-408320/3-A	Lab Control Sample	Total Recoverable	Water	6020A	408320
280-130046-1 MS	MW-15	Total Recoverable	Water	6020A	408320
280-130046-1 MSD	MW-15	Total Recoverable	Water	6020A	408320

Analysis Batch: 408949

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total Recoverable	Water	6010C	408320
280-130046-2	MW-13	Total Recoverable	Water	6010C	408320
280-130046-3	MW-16	Total Recoverable	Water	6010C	408320
280-130046-4	MW-17	Total Recoverable	Water	6010C	408320
280-130046-5	MW-14	Total Recoverable	Water	6010C	408320
280-130046-6	MW-16EB	Total Recoverable	Water	6010C	408320
280-130046-7	MW-16FD	Total Recoverable	Water	6010C	408320
MB 240-408320/1-A	Method Blank	Total Recoverable	Water	6010C	408320
LCS 240-408320/2-A	Lab Control Sample	Total Recoverable	Water	6010C	408320

General Chemistry

Analysis Batch: 475579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total/NA	Water	SM 2540C	
280-130046-2	MW-13	Total/NA	Water	SM 2540C	
280-130046-3	MW-16	Total/NA	Water	SM 2540C	
280-130046-4	MW-17	Total/NA	Water	SM 2540C	
280-130046-5	MW-14	Total/NA	Water	SM 2540C	
280-130046-6	MW-16EB	Total/NA	Water	SM 2540C	
280-130046-7	MW-16FD	Total/NA	Water	SM 2540C	
MB 280-475579/1	Method Blank	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 475579 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-475579/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-475579/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Analysis Batch: 477561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total/NA	Water	9040B	
280-130046-2	MW-13	Total/NA	Water	9040B	
280-130046-3	MW-16	Total/NA	Water	9040B	
280-130046-4	MW-17	Total/NA	Water	9040B	
280-130046-5	MW-14	Total/NA	Water	9040B	
280-130046-7	MW-16FD	Total/NA	Water	9040B	
LCS 280-477561/4	Lab Control Sample	Total/NA	Water	9040B	
280-130046-1 DU	MW-15	Total/NA	Water	9040B	

Analysis Batch: 477662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-6	MW-16EB	Total/NA	Water	9040B	
LCS 280-477662/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 478055

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total/NA	Water	9056A	
280-130046-1	MW-15	Total/NA	Water	9056A	
280-130046-2	MW-13	Total/NA	Water	9056A	
280-130046-2	MW-13	Total/NA	Water	9056A	
280-130046-3	MW-16	Total/NA	Water	9056A	
280-130046-3	MW-16	Total/NA	Water	9056A	
280-130046-4	MW-17	Total/NA	Water	9056A	
280-130046-4	MW-17	Total/NA	Water	9056A	
280-130046-5	MW-14	Total/NA	Water	9056A	
280-130046-5	MW-14	Total/NA	Water	9056A	
280-130046-6	MW-16EB	Total/NA	Water	9056A	
280-130046-7	MW-16FD	Total/NA	Water	9056A	
280-130046-7	MW-16FD	Total/NA	Water	9056A	
MB 280-478055/13	Method Blank	Total/NA	Water	9056A	
LCS 280-478055/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-478055/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-478055/10	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 449607

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total/NA	Water	PrecSep-21	
280-130046-2	MW-13	Total/NA	Water	PrecSep-21	
280-130046-3	MW-16	Total/NA	Water	PrecSep-21	
280-130046-4	MW-17	Total/NA	Water	PrecSep-21	
280-130046-5	MW-14	Total/NA	Water	PrecSep-21	
280-130046-6	MW-16EB	Total/NA	Water	PrecSep-21	
280-130046-7	MW-16FD	Total/NA	Water	PrecSep-21	
MB 160-449607/11-A	Method Blank	Total/NA	Water	PrecSep-21	

Rad (Continued)

Prep Batch: 449607 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 160-449607/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 449610

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-130046-1	MW-15	Total/NA	Water	PrecSep_0	
280-130046-2	MW-13	Total/NA	Water	PrecSep_0	
280-130046-3	MW-16	Total/NA	Water	PrecSep_0	
280-130046-4	MW-17	Total/NA	Water	PrecSep_0	
280-130046-5	MW-14	Total/NA	Water	PrecSep_0	
280-130046-6	MW-16EB	Total/NA	Water	PrecSep_0	
280-130046-7	MW-16FD	Total/NA	Water	PrecSep_0	
MB 160-449610/11-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-449610/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

Client: HDR Inc | Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-15 | Lab Sample ID: 280-130046-1

Date Collected: 10/21/19 15:00 | **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:22	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:33	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 14:32	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 02:57	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 03:14	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.31 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 08:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.31 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:21	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-13 | Lab Sample ID: 280-130046-2

Date Collected: 10/22/19 09:25 | **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:26	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:43	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 14:40	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 03:32	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 03:49	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.39 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 08:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.39 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-16 | Lab Sample ID: 280-130046-3

Date Collected: 10/22/19 11:20 | **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:31	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:46	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 14:46	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 04:59	JAP	TAL DEN

Client Sample ID: MW-16 Lab Sample ID: 280-130046-3
Date Collected: 10/22/19 11:20 **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 05:16	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.57 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 08:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.57 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-17 Lab Sample ID: 280-130046-4
Date Collected: 10/22/19 14:40 **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:35	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:53	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 14:51	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 05:34	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 05:51	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.40 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 08:32	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.40 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-14 Lab Sample ID: 280-130046-5
Date Collected: 10/22/19 15:30 **Matrix: Water**
Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:40	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:55	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 14:56	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 06:09	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 06:26	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.54 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 08:33	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.54 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL

Client Sample ID: MW-14 Lab Sample ID: 280-130046-5

Date Collected: 10/22/19 15:30 **Matrix: Water**

Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-16EB Lab Sample ID: 280-130046-6

Date Collected: 10/22/19 11:20 **Matrix: Water**

Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:52	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 14:58	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477662	11/14/19 11:49	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 04:06	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.01 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 10:41	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.01 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Client Sample ID: MW-16FD Lab Sample ID: 280-130046-7

Date Collected: 10/22/19 11:20 **Matrix: Water**

Date Received: 10/25/19 08:15

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6010C		1			408949	11/01/19 14:57	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	408320	10/30/19 14:00	MRL	TAL CAN
Total Recoverable	Analysis	6020A		1			408622	10/31/19 15:00	KLC	TAL CAN
Total/NA	Analysis	9040B		1			477561	11/13/19 15:08	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	478055	11/19/19 06:43	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	478055	11/19/19 07:01	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	475579	10/28/19 11:05	FRG	TAL DEN
Total/NA	Prep	PrecSep-21			1000.60 mL	1.0 g	449607	11/08/19 15:28	ORM	TAL SL
Total/NA	Analysis	9315		1			452597	12/02/19 10:41	SCB	TAL SL
Total/NA	Prep	PrecSep_0			1000.60 mL	1.0 g	449610	11/08/19 15:55	ORM	TAL SL
Total/NA	Analysis	9320		1			450352	11/14/19 18:22	CJQ	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			452895	12/04/19 09:09	SMP	TAL SL

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Client: HDR Inc
Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-19
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-19
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-19
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

Denver #280

eurofins Environment Testing TestAmerica

Client Information	Sampler: Travis Snyder	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 2
Client Contact: Anna Lundin	Phone: 720-838-6065	E-Mail: darlene.bandy@testamericainc.com		Page:
Company: HDR Inc		Analysis Requested		Job #:
Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:			Preservation Codes:
City: Englewood	TAT Requested (days): 10 days			
State, Zip: CO, 80112				
Phone: 734-263-7138(Tel)	PO #: DEN-018			
Email: ~~anna.lundin@hdrinc.com~~ mollyreeves@hdrinc.com	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Colorado	SSOW#:			Other:

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Boron / 6020A - Calcium (App III)	6020A - 12 Metals (App IV)	9315_Ra226, 9320_Ra228, Ra226Ra228_GFPC	9056A_28D - Cl, S, Fl / 9040B pH	2540C_Calc - TDS	Total Number of containers	Special Instructions/Note:
				Preservation Code:			D	D	D	N	N		
MW-15	10/21/19	1500	G	W	N	N	X	X	X	X	X		Sub metals to Canton / Sub RAD to St. Louis
MW-13	10/22/19	0925	G	W	N	N	X	X	X	X	X		No analysis
MW-16	10/22/19	1120	G	W	N	N	X	X	X	X	X		for Be and
MW-17	10/22/19	1440	G	W	N	N	X	X	X	X	X		Hg metals
MW-14	10/22/19	1530	G	W	N	N	X	X	X	X	X		
MW-16EB	10/22/19	1120	G	W	N	N	X	X	X	X	X		
MW-16FD	10/22/19	1120	G	W	N	N	X	X	X	X	X		

280-130046 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10/25/19 0815	HDR	[signature]	10-25-19 815	TALDEN

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 2.4 1.8, to, IR8, S6, 10/25/19

Ver: 01/16/2019

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-503806.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-130046-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 11/22/2019			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

Analysis Requested

Preservation Codes:

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

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
MW-15 (280-130046-1)	10/21/19	15:00 Mountain		Water			X	X	X	2	
MW-13 (280-130046-2)	10/22/19	09:25 Mountain		Water			X	X	X	2	
MW-16 (280-130046-3)	10/22/19	11:20 Mountain		Water			X	X	X	2	
MW-17 (280-130046-4)	10/22/19	14:40 Mountain		Water			X	X	X	2	
MW-14 (280-130046-5)	10/22/19	15:30 Mountain		Water			X	X	X	2	
MW-16EB (280-130046-6)	10/22/19	11:20 Mountain		Water			X	X	X	2	
MW-16FD (280-130046-7)	10/22/19	11:20 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10/28/19 1500		[signature]	10/29/19 9:05	TASTL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-503804.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-130046-1
Address: 4101 Shuffel Street NW, ,	Due Date Requested: 11/18/2019	**Analysis Requested**		**Preservation Codes:**
City: North Canton	TAT Requested (days):			
State, Zip: OH, 44720				
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			Other:

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

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C/3005A Boron	6020A/3005A 13 T. Metals (w/collision cell)	Total Number of containers	Special Instructions/Note: 541
			Preservation Code:							
MW-15 (280-130046-1)	10/21/19	15:00 Mountain		Water			X	X	2	, Use Collision Cell
MW-13 (280-130046-2)	10/22/19	09:25 Mountain		Water			X	X	2	, Use Collision Cell
MW-16 (280-130046-3)	10/22/19	11:20 Mountain		Water			X	X	2	, Use Collision Cell
MW-17 (280-130046-4)	10/22/19	14:40 Mountain		Water			X	X	2	, Use Collision Cell
MW-14 (280-130046-5)	10/22/19	15:30 Mountain		Water			X	X	2	, Use Collision Cell
MW-16EB (280-130046-6)	10/22/19	11:20 Mountain		Water			X	X	2	, Use Collision Cell
MW-16FD (280-130046-7)	10/22/19	11:20 Mountain		Water			X	X	2	, Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification *Unconfirmed*		*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For ______ Months*
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	10-28-19 15:55	TA-DEN	[signature]	10-29-19 930	ETA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 01/16/2019

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :**

Canton Facility

Client ETA Denver Site Name Cooler unpacked by: [illegible]

Cooler Received on 10-29-19 Opened on 10-29-19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-10 (CF +0.7 °C) Observed Cooler Temp. 3.6 °C Corrected Cooler Temp. 4.3 °C
   IR GUN #IR-11 (CF +0.9°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 — Yes No
   -Were the seals on the outside of the cooler(s) signed & dated? — Yes No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? — Yes No
   -Were tamper/custody seals intact and uncompromised? — Yes No NA
3. Shippers' packing slip attached to the cooler(s)? — Yes No
4. Did custody papers accompany the sample(s)? — Yes No
5. Were the custody papers relinquished & signed in the appropriate place? — Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? — Yes No
7. Did all bottles arrive in good condition (Unbroken)? — Yes No
8. Could all bottle labels be reconciled with the COC? — Yes No
9. Were correct bottle(s) used for the test(s) indicated? — Yes No
10. Sufficient quantity received to perform indicated analyses? — Yes No
11. Are these work share samples? — Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# **HC991818**
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ — Yes No
16. Was a LL Hg or Me Hg trip blank present? ____ — Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.

Sample(s) ____ were received in a broken container.

Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.

Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-130046-1

Login Number: 130046
List Number: 1
Creator: Zimmerman, Steven M

List Source: Eurofins TestAmerica, Denver

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
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	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-130046-1

Login Number: 130046
List Number: 2
Creator: Harris, Lorin C

List Source: Eurofins TestAmerica, St. Louis
List Creation: 10/29/19 12:41 PM

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.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
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	

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-130046-1

Login Number: 130046
List Number: 4
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 11/07/19 01:07 PM

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	24.0
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	

Tracer/Carrier Summary

Client: HDR Inc
Job ID: 280-130046-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

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

		Percent Yield (Acceptance Limits)
Lab Sample ID	**Client Sample ID**	**Ba Carrier (40-110)**
280-130046-1	MW-15	71.8
280-130046-2	MW-13	78.2
280-130046-3	MW-16	78.5
280-130046-4	MW-17	68.9
280-130046-5	MW-14	76.3
280-130046-6	MW-16EB	76.6
280-130046-7	MW-16FD	70.3
LCS 160-449607/1-A	Lab Control Sample	74.9
MB 160-449607/11-A	Method Blank	81.4

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

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

		Percent Yield (Acceptance Limits)	
Lab Sample ID	**Client Sample ID**	**Ba Carrier (40-110)**	**Y Carrier (40-110)**
280-130046-1	MW-15	71.8	80.7
280-130046-2	MW-13	78.2	83.7
280-130046-3	MW-16	78.5	78.9
280-130046-4	MW-17	68.9	64.3
280-130046-5	MW-14	76.3	72.5
280-130046-6	MW-16EB	76.6	72.9
280-130046-7	MW-16FD	70.3	80.7
LCS 160-449610/1-A	Lab Control Sample	74.9	80.7
MB 160-449610/11-A	Method Blank	81.4	73.6

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

eurofins | Environment Testing
TestAmerica

ANALYTICAL REPORT

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

Laboratory Job ID: 280-131793-1
Client Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

For:
HDR Inc
1670 Broadway, Suite 3400
Denver, Colorado 80202

Attn: Molly Reeves

Darlene Bandy

Authorized for release by:
1/13/2020 2:11:23 PM

Darlene Bandy, Project Manager I
(303)736-0188
darlene.bandy@testamericainc.com

The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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.

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Table of Contents

Definitions/Glossary

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Qualifiers

Metals

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.
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
B	Compound was found in the blank and sample.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

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)

Job ID: 280-131793-1

Laboratory: Eurofins TestAmerica, Denver

Narrative

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CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-131793-1

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

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

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

RECEIPT
The samples were received on 12/10/2019 2:36 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.7º C and 4.1º C.

TOTAL RECOVERABLE METALS (ICP)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 12/13/2019 and analyzed on 12/16/2019.

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

TOTAL RECOVERABLE METALS (ICPMS)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 12/13/2019 and analyzed on 12/17/2019 and 12/19/2019.

Calcium failed the recovery criteria low for the MS/MSD of sample MW-10D (280-131793-3) in batch 240-416149. The presence of the '4' qualifier indicates that the concentration in the unspiked sample exceeded four times the spiking amount; therefore, control limits are not applicable. Refer to the QC report for details. The acceptable LCS data indicate that the analytical system was operating within control.

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

TOTAL DISSOLVED SOLIDS
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 12/11/2019.

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

TOTAL SUSPENDED SOLIDS
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 12/11/2019.

Job ID: 280-131793-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

Total Suspended Solids was detected in method blank MB 280-480268/1 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

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

CORROSIVITY (PH)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 12/13/2019 and 12/30/2019.

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

ANIONS (28 DAYS)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/27/2019.

Samples MW-7 (280-131793-1)[5X], MW-10 (280-131793-2)[20X], MW-10 (280-131793-2)[5X], MW-10D (280-131793-3)[20X], MW-10D (280-131793-3)[5X] and MW-13 (280-131793-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Fluoride failed the recovery criteria low for the batch MS of sample 280-131784-2 in batch 280-481618. The acceptable LCS data indicate that the analytical system was operating within control.

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

RADIUM-226 (GFPC)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 12/13/2019 and analyzed on 01/07/2020.

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.

The following samples were prepared at a reduced aliquot due to discoloration and heavy sediment levels: MW-7 (280-131793-1).

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-228
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 12/13/2019 and analyzed on 12/19/2019.

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.

The following samples were prepared at a reduced aliquot due to discoloration and heavy sediment levels: MW-7 (280-131793-1).

Job ID: 280-131793-1 (Continued)

Laboratory: Eurofins TestAmerica, Denver (Continued)

Insufficient sample volume was available to perform a sample duplicate for the following samples: MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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

RADIUM-226/RADIUM-228 (GFPC)
Samples MW-7 (280-131793-1), MW-10 (280-131793-2), MW-10D (280-131793-3), MW-10EB (280-131793-4) and MW-13 (280-131793-5) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 01/09/2020.

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

Client Sample ID: MW-7 Lab Sample ID: 280-131793-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.2		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.0019	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0033	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.061		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.00066	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00024	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Calcium	120		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.015		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0030		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.0089		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.036		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.024		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.022		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00082	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	180		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	1.4		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	380		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1400		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	210	B	10	2.8	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-10 Lab Sample ID: 280-131793-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00096	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0015	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.061		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00020	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0019	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0055		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.090		0.0080	0.0017	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-10 (Continued) Lab Sample ID: 280-131793-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.071		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0042	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	370		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	0.94		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	900		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2100		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J B	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-10D Lab Sample ID: 280-131793-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3.0		0.10	0.023	mg/L	1		6010C	Total Recoverable
Antimony	0.00092	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0016	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.064		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00020	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Calcium	320		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0020		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0058		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.093		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.072		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0048	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	370		15	5.1	mg/L	5		9056A	Total/NA
Fluoride	0.97		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	890		100	21	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2100		40	19	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-10EB Lab Sample ID: 280-131793-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.0011	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	5.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-13
Lab Sample ID: 280-131793-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.51		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.079		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	140		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.00036	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.036		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0029	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	160		3.0	1.0	mg/L	1		9056A	Total/NA
Fluoride	0.68		0.50	0.17	mg/L	1		9056A	Total/NA
Sulfate	200		25	5.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	960		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	39	B	4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
9040B	pH	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	TAL DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	TAL DEN
SM 2540D	Solids, Total Suspended (TSS)	SM	TAL DEN
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	TAL SL
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL CAN
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

None = None

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

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

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Sample Summary

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
280-131793-1	MW-7	Ground Water	12/10/19 09:35	12/10/19 14:36	
280-131793-2	MW-10	Ground Water	12/10/19 12:50	12/10/19 14:36	
280-131793-3	MW-10D	Water	12/10/19 12:55	12/10/19 14:36	
280-131793-4	MW-10EB	Water	12/10/19 11:50	12/10/19 14:36	
280-131793-5	MW-13	Water	12/09/19 11:30	12/10/19 14:36	

Method: 6010C - Metals (ICP) - Total Recoverable

Client Sample ID: MW-7
Lab Sample ID: 280-131793-1
Date Collected: 12/10/19 09:35
Matrix: Ground Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**1.2**		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 13:41	1

Client Sample ID: MW-10
Lab Sample ID: 280-131793-2
Date Collected: 12/10/19 12:50
Matrix: Ground Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**3.1**		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 14:02	1

Client Sample ID: MW-10D
Lab Sample ID: 280-131793-3
Date Collected: 12/10/19 12:55
Matrix: Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**3.0**		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 14:32	1

Client Sample ID: MW-10EB
Lab Sample ID: 280-131793-4
Date Collected: 12/10/19 11:50
Matrix: Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 14:37	1

Client Sample ID: MW-13
Lab Sample ID: 280-131793-5
Date Collected: 12/09/19 11:30
Matrix: Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	**0.51**		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 14:41	1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-7
Lab Sample ID: 280-131793-1
Date Collected: 12/10/19 09:35
Matrix: Ground Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0019**	**J**	0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:14	1
Arsenic	**0.0033**	**J**	0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 21:23	1
Barium	**0.061**		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 21:23	1
Beryllium	**0.00066**	**J**	0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 21:23	1
Cadmium	**0.00024**	**J**	0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:23	1
Calcium	**120**		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 21:23	1
Chromium	**0.015**		0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 21:23	1
Cobalt	**0.0030**		0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 21:23	1
Lead	**0.0089**		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 21:23	1
Lithium	**0.036**		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 21:23	1
Molybdenum	**0.024**		0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:14	1
Selenium	**0.022**		0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 21:23	1
Thallium	**0.00082**	**J**	0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:23	1

Client Sample ID: MW-10
Lab Sample ID: 280-131793-2
Date Collected: 12/10/19 12:50
Matrix: Ground Water
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00096**	**J**	0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:16	1

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

Client Sample ID: MW-10
Date Collected: 12/10/19 12:50
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-2
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0015**	**J**	0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 21:27	1
Barium	**0.061**		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 21:27	1
Beryllium	ND		0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 21:27	1
Cadmium	**0.00020**	**J**	0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:27	1
Calcium	**300**		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 21:27	1
Chromium	**0.0019**	**J**	0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 21:27	1
Cobalt	**0.0055**		0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 21:27	1
Lead	ND		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 21:27	1
Lithium	**0.090**		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 21:27	1
Molybdenum	**0.071**		0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:16	1
Selenium	**0.0042**	**J**	0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 21:27	1
Thallium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:27	1

Client Sample ID: MW-10D
Date Collected: 12/10/19 12:55
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.00092**	**J**	0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:18	1
Arsenic	**0.0016**	**J**	0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 21:31	1
Barium	**0.064**		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 21:31	1
Beryllium	ND		0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 21:31	1
Cadmium	**0.00020**	**J**	0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:31	1
Calcium	**320**		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 21:31	1
Chromium	**0.0020**		0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 21:31	1
Cobalt	**0.0058**		0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 21:31	1
Lead	ND		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 21:31	1
Lithium	**0.093**		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 21:31	1
Molybdenum	**0.072**		0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:18	1
Selenium	**0.0048**	**J**	0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 21:31	1
Thallium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:31	1

Client Sample ID: MW-10EB
Date Collected: 12/10/19 11:50
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:29	1
Arsenic	ND		0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 22:01	1
Barium	ND		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 22:01	1
Beryllium	ND		0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 22:01	1
Cadmium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 22:01	1
Calcium	ND		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 22:01	1
Chromium	ND		0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 22:01	1
Cobalt	ND		0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 22:01	1
Lead	ND		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 22:01	1
Lithium	ND		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 22:01	1
Molybdenum	**0.0011**	**J**	0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:29	1
Selenium	ND		0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 22:01	1
Thallium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 22:01	1

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-131793-1

Method: 6020A - Metals (ICP/MS) - Total Recoverable

Client Sample ID: MW-13
Date Collected: 12/09/19 11:30
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:31	1
Arsenic	ND		0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 22:05	1
Barium	**0.079**		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 22:05	1
Beryllium	ND		0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 22:05	1
Cadmium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 22:05	1
Calcium	**140**		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 22:05	1
Chromium	ND		0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 22:05	1
Cobalt	**0.00036**	**J**	0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 22:05	1
Lead	ND		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 22:05	1
Lithium	**0.036**		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 22:05	1
Molybdenum	**0.0034**	**J**	0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:31	1
Selenium	**0.0029**	**J**	0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 22:05	1
Thallium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 22:05	1

General Chemistry

Client Sample ID: MW-7
Date Collected: 12/10/19 09:35
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-1
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.8**	**HF**	0.1	0.1	SU			12/13/19 15:50	1
Temperature	**22.0**	**HF**	1.0	1.0	Degrees C			12/13/19 15:50	1
Chloride	**180**		15	5.1	mg/L			12/27/19 17:22	5
Fluoride	**1.4**		0.50	0.17	mg/L			12/27/19 17:06	1
Sulfate	**380**		25	5.2	mg/L			12/27/19 17:22	5
Total Dissolved Solids (TDS)	**1400**		20	9.4	mg/L			12/11/19 14:11	1
Total Suspended Solids	**210**	**B**	10	2.8	mg/L			12/11/19 15:46	1

Client Sample ID: MW-10
Date Collected: 12/10/19 12:50
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-2
Matrix: Ground Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**8.2**	**HF**	0.1	0.1	SU			12/13/19 15:54	1
Temperature	**22.0**	**HF**	1.0	1.0	Degrees C			12/13/19 15:54	1
Chloride	**370**		15	5.1	mg/L			12/27/19 18:11	5
Fluoride	**0.94**		0.50	0.17	mg/L			12/27/19 17:55	1
Sulfate	**900**		100	21	mg/L			12/27/19 18:28	20
Total Dissolved Solids (TDS)	**2100**		40	19	mg/L			12/11/19 14:11	1
Total Suspended Solids	**3.2**	**J B**	4.0	1.1	mg/L			12/11/19 15:46	1

Client Sample ID: MW-10D
Date Collected: 12/10/19 12:55
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**8.2**	**HF**	0.1	0.1	SU			12/13/19 15:57	1
Temperature	**22.4**	**HF**	1.0	1.0	Degrees C			12/13/19 15:57	1
Chloride	**370**		15	5.1	mg/L			12/27/19 22:01	5
Fluoride	**0.97**		0.50	0.17	mg/L			12/27/19 21:44	1
Sulfate	**890**		100	21	mg/L			12/27/19 22:17	20
Total Dissolved Solids (TDS)	**2100**		40	19	mg/L			12/11/19 14:11	1

General Chemistry (Continued)

Client Sample ID: MW-10D
Date Collected: 12/10/19 12:55
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			12/11/19 15:46	1

Client Sample ID: MW-10EB
Date Collected: 12/10/19 11:50
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**5.7**	**HF**	0.1	0.1	SU			12/30/19 20:16	1
Temperature	**24.1**	**HF**	1.0	1.0	Degrees C			12/30/19 20:16	1
Chloride	ND		3.0	1.0	mg/L			12/27/19 22:34	1
Fluoride	ND		0.50	0.17	mg/L			12/27/19 22:34	1
Sulfate	ND		5.0	1.0	mg/L			12/27/19 22:34	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			12/11/19 14:11	1
Total Suspended Solids	ND		4.0	1.1	mg/L			12/11/19 15:46	1

Client Sample ID: MW-13
Date Collected: 12/09/19 11:30
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	**7.8**	**HF**	0.1	0.1	SU			12/30/19 20:26	1
Temperature	**24.7**	**HF**	1.0	1.0	Degrees C			12/30/19 20:26	1
Chloride	**160**		3.0	1.0	mg/L			12/27/19 13:31	1
Fluoride	**0.68**		0.50	0.17	mg/L			12/27/19 13:31	1
Sulfate	**200**		25	5.2	mg/L			12/27/19 13:47	5
Total Dissolved Solids (TDS)	**960**		20	9.4	mg/L			12/11/19 14:11	1
Total Suspended Solids	**39**	**B**	4.0	1.1	mg/L			12/11/19 15:46	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-7
Date Collected: 12/10/19 09:35
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-1
Matrix: Ground Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.310**		0.162	0.165	1.00	0.219	pCi/L	12/13/19 08:54	01/07/20 11:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*70.4*		*40 - 110*	*12/13/19 08:54*	*01/07/20 11:18*	*1*

Client Sample ID: MW-10
Date Collected: 12/10/19 12:50
Date Received: 12/10/19 14:36

Lab Sample ID: 280-131793-2
Matrix: Ground Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0625	U	0.107	0.107	1.00	0.186	pCi/L	12/13/19 08:54	01/07/20 11:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*54.0*		*40 - 110*	*12/13/19 08:54*	*01/07/20 11:18*	*1*

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-10D **Lab Sample ID: 280-131793-3**
Date Collected: 12/10/19 12:55 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0280	U	0.0689	0.0689	1.00	0.124	pCi/L	12/13/19 08:54	01/07/20 11:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.9*		*40 - 110*	*12/13/19 08:54*	*01/07/20 11:18*	*1*

Client Sample ID: MW-10EB **Lab Sample ID: 280-131793-4**
Date Collected: 12/10/19 11:50 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0174	U	0.0566	0.0566	1.00	0.117	pCi/L	12/13/19 08:54	01/07/20 11:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*106*		*40 - 110*	*12/13/19 08:54*	*01/07/20 11:18*	*1*

Client Sample ID: MW-13 **Lab Sample ID: 280-131793-5**
Date Collected: 12/09/19 11:30 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.338**		0.103	0.107	1.00	0.0968	pCi/L	12/13/19 08:54	01/07/20 13:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.1*		*40 - 110*	*12/13/19 08:54*	*01/07/20 13:05*	*1*

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-7 **Lab Sample ID: 280-131793-1**
Date Collected: 12/10/19 09:35 **Matrix: Ground Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.651	U	0.492	0.495	1.00	0.774	pCi/L	12/13/19 09:26	12/19/19 17:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*70.4*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*
Y Carrier	*89.0*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*

Client Sample ID: MW-10 **Lab Sample ID: 280-131793-2**
Date Collected: 12/10/19 12:50 **Matrix: Ground Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.257	U	0.464	0.464	1.00	0.786	pCi/L	12/13/19 09:26	12/19/19 17:27	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*54.0*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*
Y Carrier	*89.9*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*

Client Sample ID: MW-10D | **Lab Sample ID: 280-131793-3**
Date Collected: 12/10/19 12:55 | **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.307	U	0.269	0.271	1.00	0.431	pCi/L	12/13/19 09:26	12/19/19 17:27	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*92.9*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*
Y Carrier	*88.1*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:27*	*1*

Client Sample ID: MW-10EB | **Lab Sample ID: 280-131793-4**
Date Collected: 12/10/19 11:50 | **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.217	U	0.242	0.242	1.00	0.397	pCi/L	12/13/19 09:26	12/19/19 17:28	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*106*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:28*	*1*
Y Carrier	*86.9*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:28*	*1*

Client Sample ID: MW-13 | **Lab Sample ID: 280-131793-5**
Date Collected: 12/09/19 11:30 | **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.199	U	0.237	0.237	1.00	0.390	pCi/L	12/13/19 09:26	12/19/19 17:29	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	*94.1*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:29*	*1*
Y Carrier	*88.4*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:29*	*1*

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

Client Sample ID: MW-7 | **Lab Sample ID: 280-131793-1**
Date Collected: 12/10/19 09:35 | **Matrix: Ground Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.960**		0.518	0.522	5.00	0.774	pCi/L		01/09/20 08:35	1

Client: HDR Inc Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

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

Client Sample ID: MW-10 **Lab Sample ID: 280-131793-2**
Date Collected: 12/10/19 12:50 **Matrix: Ground Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.319	U	0.476	0.476	5.00	0.786	pCi/L		01/09/20 08:35	1

Client Sample ID: MW-10D **Lab Sample ID: 280-131793-3**
Date Collected: 12/10/19 12:55 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.335	U	0.278	0.280	5.00	0.431	pCi/L		01/09/20 08:35	1

Client Sample ID: MW-10EB **Lab Sample ID: 280-131793-4**
Date Collected: 12/10/19 11:50 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.200	U	0.249	0.249	5.00	0.397	pCi/L		01/09/20 08:35	1

Client Sample ID: MW-13 **Lab Sample ID: 280-131793-5**
Date Collected: 12/09/19 11:30 **Matrix: Water**
Date Received: 12/10/19 14:36

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.537**		0.258	0.260	5.00	0.390	pCi/L		01/09/20 08:35	1

QC Sample Results

Client: HDR Inc
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Job ID: 280-131793-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-415426/1-A
Matrix: Water
Analysis Batch: 415919

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		12/13/19 14:00	12/16/19 13:33	1

Lab Sample ID: LCS 240-415426/2-A
Matrix: Water
Analysis Batch: 415919

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.00		mg/L		100	80 - 120

Lab Sample ID: 280-131793-1 MS
Matrix: Ground Water
Analysis Batch: 415919

Client Sample ID: MW-7
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.2		1.00	2.20		mg/L		99	75 - 125

Lab Sample ID: 280-131793-1 MSD
Matrix: Ground Water
Analysis Batch: 415919

Client Sample ID: MW-7
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.2		1.00	2.18		mg/L		97	75 - 125	1	20

Lab Sample ID: 280-131793-2 MS
Matrix: Ground Water
Analysis Batch: 415919

Client Sample ID: MW-10
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	3.1		1.00	4.29		mg/L		123	75 - 125

Lab Sample ID: 280-131793-2 MSD
Matrix: Ground Water
Analysis Batch: 415919

Client Sample ID: MW-10
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	3.1		1.00	4.18		mg/L		113	75 - 125	2	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-415426/1-A
Matrix: Water
Analysis Batch: 416149

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.00075	mg/L		12/13/19 14:00	12/17/19 21:14	1
Barium	ND		0.0050	0.0022	mg/L		12/13/19 14:00	12/17/19 21:14	1
Beryllium	ND		0.0010	0.00031	mg/L		12/13/19 14:00	12/17/19 21:14	1
Cadmium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:14	1
Calcium	ND		1.0	0.58	mg/L		12/13/19 14:00	12/17/19 21:14	1
Chromium	ND		0.0020	0.00098	mg/L		12/13/19 14:00	12/17/19 21:14	1

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

Lab Sample ID: MB 240-415426/1-A
Matrix: Water
Analysis Batch: 416149

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		0.0010	0.00019	mg/L		12/13/19 14:00	12/17/19 21:14	1
Lead	ND		0.0010	0.00045	mg/L		12/13/19 14:00	12/17/19 21:14	1
Lithium	ND		0.0080	0.0017	mg/L		12/13/19 14:00	12/17/19 21:14	1
Selenium	ND		0.0050	0.00089	mg/L		12/13/19 14:00	12/17/19 21:14	1
Thallium	ND		0.0010	0.00020	mg/L		12/13/19 14:00	12/17/19 21:14	1

Lab Sample ID: MB 240-415426/1-A
Matrix: Water
Analysis Batch: 416464

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		12/13/19 14:00	12/19/19 18:05	1
Molybdenum	ND		0.010	0.0011	mg/L		12/13/19 14:00	12/19/19 18:05	1

Lab Sample ID: LCS 240-415426/3-A
Matrix: Water
Analysis Batch: 416149

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	1.00	1.05		mg/L		105	80 - 120
Barium	1.00	0.979		mg/L		98	80 - 120
Beryllium	0.500	0.519		mg/L		104	80 - 120
Cadmium	0.500	0.506		mg/L		101	80 - 120
Calcium	25.0	25.0		mg/L		100	80 - 120
Chromium	0.500	0.514		mg/L		103	80 - 120
Cobalt	0.500	0.519		mg/L		104	80 - 120
Lead	0.500	0.498		mg/L		100	80 - 120
Lithium	0.500	0.499		mg/L		100	80 - 120
Selenium	1.00	1.02		mg/L		102	80 - 120
Thallium	1.00	0.994		mg/L		99	80 - 120

Lab Sample ID: LCS 240-415426/3-A
Matrix: Water
Analysis Batch: 416464

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.108		mg/L		108	80 - 120
Molybdenum	0.500	0.504		mg/L		101	80 - 120

Lab Sample ID: 280-131793-3 MS
Matrix: Water
Analysis Batch: 416149

Client Sample ID: MW-10D
Prep Type: Total Recoverable
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	0.0016	J	1.00	1.09		mg/L		109	75 - 125
Barium	0.064		1.00	1.10		mg/L		103	75 - 125
Beryllium	ND		0.500	0.599		mg/L		120	75 - 125
Cadmium	0.00020	J	0.500	0.501		mg/L		100	75 - 125
Calcium	320		25.0	320	4	mg/L		-2	75 - 125
Chromium	0.0020		0.500	0.523		mg/L		104	75 - 125

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

Lab Sample ID: 280-131793-3 MS
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 416149
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Cobalt	0.0058		0.500	0.526		mg/L		104	75 - 125
Lead	ND		0.500	0.493		mg/L		99	75 - 125
Lithium	0.093		0.500	0.660		mg/L		113	75 - 125
Selenium	0.0048	J	1.00	1.02		mg/L		102	75 - 125
Thallium	ND		1.00	0.997		mg/L		100	75 - 125

Lab Sample ID: 280-131793-3 MS
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 416464
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.00092	J	0.100	0.118		mg/L		117	75 - 125
Molybdenum	0.072		0.500	0.646		mg/L		115	75 - 125

Lab Sample ID: 280-131793-3 MSD
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 416149
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Arsenic	0.0016	J	1.00	1.08		mg/L		108	75 - 125	1	20
Barium	0.064		1.00	1.09		mg/L		103	75 - 125	0	20
Beryllium	ND		0.500	0.549		mg/L		110	75 - 125	9	20
Cadmium	0.00020	J	0.500	0.498		mg/L		99	75 - 125	1	20
Calcium	320		25.0	318	4	mg/L		-12	75 - 125	1	20
Chromium	0.0020		0.500	0.519		mg/L		103	75 - 125	1	20
Cobalt	0.0058		0.500	0.524		mg/L		104	75 - 125	0	20
Lead	ND		0.500	0.492		mg/L		98	75 - 125	0	20
Lithium	0.093		0.500	0.610		mg/L		103	75 - 125	8	20
Selenium	0.0048	J	1.00	1.02		mg/L		102	75 - 125	0	20
Thallium	ND		1.00	0.995		mg/L		99	75 - 125	0	20

Lab Sample ID: 280-131793-3 MSD
Client Sample ID: MW-10D
Matrix: Water
Prep Type: Total Recoverable
Analysis Batch: 416464
Prep Batch: 415426

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	0.00092	J	0.100	0.117		mg/L		116	75 - 125	1	20
Molybdenum	0.072		0.500	0.638		mg/L		113	75 - 125	1	20

Method: 9040B - pH

Lab Sample ID: LCS 280-480631/4
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 480631

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Method: 9040B - pH (Continued)

Lab Sample ID: LCS 280-482006/56 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 482006

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: 280-131793-4 DU | **Client Sample ID: MW-10EB**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 482006

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	5.7	HF	5.7		SU		0.5	5
Temperature	24.1	HF	24.3		Degrees C		0.5	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-481618/6 | **Client Sample ID: Method Blank**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 481618

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			12/26/19 12:08	1
Fluoride	ND		0.50	0.17	mg/L			12/26/19 12:08	1
Sulfate	ND		5.0	1.0	mg/L			12/26/19 12:08	1

Lab Sample ID: LCS 280-481618/4 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 481618

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	99.6		mg/L		100	90 - 110
Fluoride	5.00	4.93		mg/L		99	90 - 110
Sulfate	100	97.7		mg/L		98	90 - 110

Lab Sample ID: LCSD 280-481618/5 | **Client Sample ID: Lab Control Sample Dup**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 481618

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	99.6		mg/L		100	90 - 110	0	10
Fluoride	5.00	4.93		mg/L		99	90 - 110	0	10
Sulfate	100	97.8		mg/L		98	90 - 110	0	10

Lab Sample ID: MRL 280-481618/3 | **Client Sample ID: Lab Control Sample**
Matrix: Water | **Prep Type: Total/NA**
Analysis Batch: 481618

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	4.10		mg/L		82	50 - 150
Fluoride	0.500	0.502		mg/L		100	50 - 150
Sulfate	5.00	4.37	J	mg/L		87	50 - 150

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

Lab Sample ID: MB 280-481740/6 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 481740

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	1.0	mg/L			12/27/19 16:44	1
Fluoride	ND		0.50	0.17	mg/L			12/27/19 16:44	1
Sulfate	ND		5.0	1.0	mg/L			12/27/19 16:44	1

Lab Sample ID: LCS 280-481740/4 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 481740

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	95.0		mg/L		95	90 - 110
Fluoride	5.00	4.73		mg/L		95	90 - 110
Sulfate	100	97.8		mg/L		98	90 - 110

Lab Sample ID: LCSD 280-481740/5 — **Client Sample ID: Lab Control Sample Dup**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 481740

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	100	95.2		mg/L		95	90 - 110	0	10
Fluoride	5.00	4.77		mg/L		95	90 - 110	1	10
Sulfate	100	98.1		mg/L		98	90 - 110	0	10

Lab Sample ID: MRL 280-481740/3 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 481740

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	5.00	3.99		mg/L		80	50 - 150
Fluoride	0.500	0.520		mg/L		104	50 - 150
Sulfate	5.00	4.31	J	mg/L		86	50 - 150

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

Lab Sample ID: MB 280-480260/1 — **Client Sample ID: Method Blank**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 480260

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			12/11/19 14:11	1

Lab Sample ID: LCS 280-480260/2 — **Client Sample ID: Lab Control Sample**
Matrix: Water — **Prep Type: Total/NA**
Analysis Batch: 480260

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	494		mg/L		99	93 - 110

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

Lab Sample ID: LCSD 280-480260/3　　**Client Sample ID: Lab Control Sample Dup**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 480260

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)			501	492		mg/L		98	93 - 110	0	20

Lab Sample ID: 280-131793-5 DU　　**Client Sample ID: MW-13**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 480260

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids (TDS)	960			950		mg/L				0.6	10

Method: SM 2540D - Solids, Total Suspended (TSS)

Lab Sample ID: MB 280-480268/1　　**Client Sample ID: Method Blank**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 480268

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	1.20	J	4.0	1.1	mg/L			12/11/19 15:46	1

Lab Sample ID: LCS 280-480268/2　　**Client Sample ID: Lab Control Sample**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 480268

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids			100	84.0		mg/L		84	79 - 114

Lab Sample ID: LCSD 280-480268/3　　**Client Sample ID: Lab Control Sample Dup**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 480268

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Suspended Solids			100	92.0		mg/L		92	79 - 114	9	20

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-454191/12-A　　**Client Sample ID: Method Blank**
Matrix: Water　　**Prep Type: Total/NA**
Analysis Batch: 456037　　**Prep Batch: 454191**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.005168	U	0.0512	0.0512	1.00	0.103	pCi/L	12/13/19 08:54	01/07/20 13:05	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*12/13/19 08:54*	*01/07/20 13:05*	*1*

QC Sample Results

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

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

Lab Sample ID: LCS 160-454191/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 456037
Prep Batch: 454191

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.3	9.358		0.959	1.00	0.0698	pCi/L	82	75 - 125

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

Lab Sample ID: LCSD 160-454191/2-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 456037
Prep Batch: 454191

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.3	10.31		1.05	1.00	0.101	pCi/L	91	75 - 125	0.48	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*107*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-454195/12-A
Client Sample ID: Method Blank
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 454804
Prep Batch: 454195

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.04247	U	0.173	0.173	1.00	0.308	pCi/L	12/13/19 09:26	12/19/19 17:29	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*104*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:29*	*1*
Y Carrier	*88.1*		*40 - 110*	*12/13/19 09:26*	*12/19/19 17:29*	*1*

Lab Sample ID: LCS 160-454195/1-A
Client Sample ID: Lab Control Sample
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 454790
Prep Batch: 454195

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.29	9.468		1.09	1.00	0.414	pCi/L	102	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*106*		*40 - 110*
Y Carrier	*91.4*		*40 - 110*

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: LCSD 160-454195/2-A **Client Sample ID: Lab Control Sample Dup**
Matrix: Water **Prep Type: Total/NA**
Analysis Batch: 454790 **Prep Batch: 454195**

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			9.29	9.513		1.11	1.00	0.471	pCi/L	102	75 - 125	0.02	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*107*		*40 - 110*
Y Carrier	*88.7*		*40 - 110*

Metals

Prep Batch: 415426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total Recoverable	Ground Water	3005A	
280-131793-2	MW-10	Total Recoverable	Ground Water	3005A	
280-131793-3	MW-10D	Total Recoverable	Water	3005A	
280-131793-4	MW-10EB	Total Recoverable	Water	3005A	
280-131793-5	MW-13	Total Recoverable	Water	3005A	
MB 240-415426/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-415426/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-415426/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-131793-1 MS	MW-7	Total Recoverable	Ground Water	3005A	
280-131793-1 MSD	MW-7	Total Recoverable	Ground Water	3005A	
280-131793-2 MS	MW-10	Total Recoverable	Ground Water	3005A	
280-131793-2 MSD	MW-10	Total Recoverable	Ground Water	3005A	
280-131793-3 MS	MW-10D	Total Recoverable	Water	3005A	
280-131793-3 MSD	MW-10D	Total Recoverable	Water	3005A	

Analysis Batch: 415919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total Recoverable	Ground Water	6010C	415426
280-131793-2	MW-10	Total Recoverable	Ground Water	6010C	415426
280-131793-3	MW-10D	Total Recoverable	Water	6010C	415426
280-131793-4	MW-10EB	Total Recoverable	Water	6010C	415426
280-131793-5	MW-13	Total Recoverable	Water	6010C	415426
MB 240-415426/1-A	Method Blank	Total Recoverable	Water	6010C	415426
LCS 240-415426/2-A	Lab Control Sample	Total Recoverable	Water	6010C	415426
280-131793-1 MS	MW-7	Total Recoverable	Ground Water	6010C	415426
280-131793-1 MSD	MW-7	Total Recoverable	Ground Water	6010C	415426
280-131793-2 MS	MW-10	Total Recoverable	Ground Water	6010C	415426
280-131793-2 MSD	MW-10	Total Recoverable	Ground Water	6010C	415426

Analysis Batch: 416149

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total Recoverable	Ground Water	6020A	415426
280-131793-2	MW-10	Total Recoverable	Ground Water	6020A	415426
280-131793-3	MW-10D	Total Recoverable	Water	6020A	415426
280-131793-4	MW-10EB	Total Recoverable	Water	6020A	415426
280-131793-5	MW-13	Total Recoverable	Water	6020A	415426
MB 240-415426/1-A	Method Blank	Total Recoverable	Water	6020A	415426
LCS 240-415426/3-A	Lab Control Sample	Total Recoverable	Water	6020A	415426
280-131793-3 MS	MW-10D	Total Recoverable	Water	6020A	415426
280-131793-3 MSD	MW-10D	Total Recoverable	Water	6020A	415426

Analysis Batch: 416464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total Recoverable	Ground Water	6020A	415426
280-131793-2	MW-10	Total Recoverable	Ground Water	6020A	415426
280-131793-3	MW-10D	Total Recoverable	Water	6020A	415426
280-131793-4	MW-10EB	Total Recoverable	Water	6020A	415426
280-131793-5	MW-13	Total Recoverable	Water	6020A	415426
MB 240-415426/1-A	Method Blank	Total Recoverable	Water	6020A	415426
LCS 240-415426/3-A	Lab Control Sample	Total Recoverable	Water	6020A	415426
280-131793-3 MS	MW-10D	Total Recoverable	Water	6020A	415426

Metals (Continued)

Analysis Batch: 416464 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-3 MSD	MW-10D	Total Recoverable	Water	6020A	415426

General Chemistry

Analysis Batch: 480260

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	SM 2540C	
280-131793-2	MW-10	Total/NA	Ground Water	SM 2540C	
280-131793-3	MW-10D	Total/NA	Water	SM 2540C	
280-131793-4	MW-10EB	Total/NA	Water	SM 2540C	
280-131793-5	MW-13	Total/NA	Water	SM 2540C	
MB 280-480260/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-480260/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-480260/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	
280-131793-5 DU	MW-13	Total/NA	Water	SM 2540C	

Analysis Batch: 480268

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	SM 2540D	
280-131793-2	MW-10	Total/NA	Ground Water	SM 2540D	
280-131793-3	MW-10D	Total/NA	Water	SM 2540D	
280-131793-4	MW-10EB	Total/NA	Water	SM 2540D	
280-131793-5	MW-13	Total/NA	Water	SM 2540D	
MB 280-480268/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-480268/2	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-480268/3	Lab Control Sample Dup	Total/NA	Water	SM 2540D	

Analysis Batch: 480631

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	9040B	
280-131793-2	MW-10	Total/NA	Ground Water	9040B	
280-131793-3	MW-10D	Total/NA	Water	9040B	
LCS 280-480631/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 481618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-5	MW-13	Total/NA	Water	9056A	
280-131793-5	MW-13	Total/NA	Water	9056A	
MB 280-481618/6	Method Blank	Total/NA	Water	9056A	
LCS 280-481618/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-481618/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-481618/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 481740

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	9056A	
280-131793-1	MW-7	Total/NA	Ground Water	9056A	
280-131793-2	MW-10	Total/NA	Ground Water	9056A	
280-131793-2	MW-10	Total/NA	Ground Water	9056A	
280-131793-2	MW-10	Total/NA	Ground Water	9056A	
280-131793-3	MW-10D	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 481740 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-3	MW-10D	Total/NA	Water	9056A	
280-131793-3	MW-10D	Total/NA	Water	9056A	
280-131793-4	MW-10EB	Total/NA	Water	9056A	
MB 280-481740/6	Method Blank	Total/NA	Water	9056A	
LCS 280-481740/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-481740/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-481740/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 482006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-4	MW-10EB	Total/NA	Water	9040B	
280-131793-5	MW-13	Total/NA	Water	9040B	
LCS 280-482006/56	Lab Control Sample	Total/NA	Water	9040B	
280-131793-4 DU	MW-10EB	Total/NA	Water	9040B	

Rad

Prep Batch: 454191

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	PrecSep-21	
280-131793-2	MW-10	Total/NA	Ground Water	PrecSep-21	
280-131793-3	MW-10D	Total/NA	Water	PrecSep-21	
280-131793-4	MW-10EB	Total/NA	Water	PrecSep-21	
280-131793-5	MW-13	Total/NA	Water	PrecSep-21	
MB 160-454191/12-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-454191/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-454191/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 454195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-131793-1	MW-7	Total/NA	Ground Water	PrecSep_0	
280-131793-2	MW-10	Total/NA	Ground Water	PrecSep_0	
280-131793-3	MW-10D	Total/NA	Water	PrecSep_0	
280-131793-4	MW-10EB	Total/NA	Water	PrecSep_0	
280-131793-5	MW-13	Total/NA	Water	PrecSep_0	
MB 160-454195/12-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-454195/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-454195/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

Client: HDR Inc

Job ID: 280-131793-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-7

Lab Sample ID: 280-131793-1

Date Collected: 12/10/19 09:35

Matrix: Ground Water

Date Received: 12/10/19 14:36

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			415919	12/16/19 13:41	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416149	12/17/19 21:23	DTN	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416464	12/19/19 18:14	DSH	TAL CAN
Total/NA	Analysis	9040B		1			480631	12/13/19 15:50	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	481740	12/27/19 17:06	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	481740	12/27/19 17:22	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	480260	12/11/19 14:11	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	100 mL	250 mL	480268	12/11/19 15:46	ECL	TAL DEN
Total/NA	Prep	PrecSep-21			750.32 mL	1.0 g	454191	12/13/19 08:54	RBR	TAL SL
Total/NA	Analysis	9315		1			456037	01/07/20 11:18	KLS	TAL SL
Total/NA	Prep	PrecSep_0			750.32 mL	1.0 g	454195	12/13/19 09:26	RBR	TAL SL
Total/NA	Analysis	9320		1			454790	12/19/19 17:27	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			456276	01/09/20 08:35	SMP	TAL SL

Client Sample ID: MW-10

Lab Sample ID: 280-131793-2

Date Collected: 12/10/19 12:50

Matrix: Ground Water

Date Received: 12/10/19 14:36

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			415919	12/16/19 14:02	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416149	12/17/19 21:27	DTN	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416464	12/19/19 18:16	DSH	TAL CAN
Total/NA	Analysis	9040B		1			480631	12/13/19 15:54	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	481740	12/27/19 17:55	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	481740	12/27/19 18:11	JAP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	481740	12/27/19 18:28	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	480260	12/11/19 14:11	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	480268	12/11/19 15:46	ECL	TAL DEN
Total/NA	Prep	PrecSep-21			999.69 mL	1.0 g	454191	12/13/19 08:54	RBR	TAL SL
Total/NA	Analysis	9315		1			456037	01/07/20 11:18	KLS	TAL SL
Total/NA	Prep	PrecSep_0			999.69 mL	1.0 g	454195	12/13/19 09:26	RBR	TAL SL
Total/NA	Analysis	9320		1			454790	12/19/19 17:27	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			456276	01/09/20 08:35	SMP	TAL SL

Lab Chronicle

Client: HDR Inc — Job ID: 280-131793-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-10D — Lab Sample ID: 280-131793-3

Date Collected: 12/10/19 12:55 — **Matrix: Water**

Date Received: 12/10/19 14:36

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			415919	12/16/19 14:32	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416149	12/17/19 21:31	DTN	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416464	12/19/19 18:18	DSH	TAL CAN
Total/NA	Analysis	9040B		1			480631	12/13/19 15:57	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	481740	12/27/19 21:44	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	481740	12/27/19 22:01	JAP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	481740	12/27/19 22:17	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	480260	12/11/19 14:11	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	480268	12/11/19 15:46	ECL	TAL DEN
Total/NA	Prep	PrecSep-21			1000.74 mL	1.0 g	454191	12/13/19 08:54	RBR	TAL SL
Total/NA	Analysis	9315		1			456037	01/07/20 11:18	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.74 mL	1.0 g	454195	12/13/19 09:26	RBR	TAL SL
Total/NA	Analysis	9320		1			454790	12/19/19 17:27	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			456276	01/09/20 08:35	SMP	TAL SL

Client Sample ID: MW-10EB — Lab Sample ID: 280-131793-4

Date Collected: 12/10/19 11:50 — **Matrix: Water**

Date Received: 12/10/19 14:36

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			415919	12/16/19 14:37	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416149	12/17/19 22:01	DTN	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416464	12/19/19 18:29	DSH	TAL CAN
Total/NA	Analysis	9040B		1			482006	12/30/19 20:16	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	481740	12/27/19 22:34	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	480260	12/11/19 14:11	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	480268	12/11/19 15:46	ECL	TAL DEN
Total/NA	Prep	PrecSep-21			1000.54 mL	1.0 g	454191	12/13/19 08:54	RBR	TAL SL
Total/NA	Analysis	9315		1			456037	01/07/20 11:18	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.54 mL	1.0 g	454195	12/13/19 09:26	RBR	TAL SL
Total/NA	Analysis	9320		1			454790	12/19/19 17:28	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			456276	01/09/20 08:35	SMP	TAL SL

Lab Chronicle

Client: HDR Inc Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Client Sample ID: MW-13 **Lab Sample ID: 280-131793-5**
Date Collected: 12/09/19 11:30 **Matrix: Water**
Date Received: 12/10/19 14:36

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6010C		1			415919	12/16/19 14:41	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416149	12/17/19 22:05	DTN	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	415426	12/13/19 14:00	SLD	TAL CAN
Total Recoverable	Analysis	6020A		1			416464	12/19/19 18:31	DSH	TAL CAN
Total/NA	Analysis	9040B		1			482006	12/30/19 20:26	SPG	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	481618	12/27/19 13:31	JAP	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	481618	12/27/19 13:47	JAP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	480260	12/11/19 14:11	ECL	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	480268	12/11/19 15:46	ECL	TAL DEN
Total/NA	Prep	PrecSep-21			1000.56 mL	1.0 g	454191	12/13/19 08:54	RBR	TAL SL
Total/NA	Analysis	9315		1			456037	01/07/20 13:05	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.56 mL	1.0 g	454195	12/13/19 09:26	RBR	TAL SL
Total/NA	Analysis	9320		1			454804	12/19/19 17:29	KLS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			456276	01/09/20 08:35	SMP	TAL SL

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

TAL DEN = Eurofins TestAmerica, Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

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

Accreditation/Certification Summary

Client: HDR Inc — Job ID: 280-131793-1

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, Denver

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

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025	01-08-20

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

Analysis Method	Prep Method	Matrix	Analyte
9040B		Ground Water	Temperature
9040B		Water	Temperature

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Accreditation/Certification Summary

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Laboratory: Eurofins TestAmerica, St. Louis

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2305	04-06-22
ANAB	Dept. of Energy	L2305.01	04-06-22
ANAB	ISO/IEC 17025	L2305	04-06-22
Arizona	State	AZ0813	12-08-20
California	Los Angeles County Sanitation Districts	10259	06-30-20
California	State	2886	06-30-20
Connecticut	State	PH-0241	03-31-21
Florida	NELAP	E87689	06-30-20
HI - RadChem Recognition	State	n/a	06-30-20
Iowa	State	373	09-17-20
Kansas	NELAP	E-10236	10-31-20
Kentucky (DW)	State	KY90125	12-31-20
Louisiana	NELAP	04080	06-30-20
Louisiana (DW)	State	LA011	12-31-20
Maryland	State	310	09-30-20
MI - RadChem Recognition	State	9005	06-30-20
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-20
New Jersey	NELAP	MO002	06-30-20
New York	NELAP	11616	04-01-20
North Dakota	State	R-207	06-30-20
NRC	NRC	24-24817-01	12-31-22
Oklahoma	State	9997	08-31-20
Pennsylvania	NELAP	68-00540	02-28-20
South Carolina	State	85002001	06-30-20
Texas	NELAP	T104704193-19-13	07-31-20
US Fish & Wildlife	US Federal Programs	058448	07-31-20
USDA	US Federal Programs	P330-17-00028	02-02-20
Utah	NELAP	MO000542019-11	07-31-20
Virginia	NELAP	10310	06-14-20
Washington	State	C592	08-30-20
West Virginia DEP	State	381	10-31-20

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

Denver eurofins Environment Testing TestAmerica
#280

280-131793 Chain of Custody

Client Information	Sampler: Emily Muñoz	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No:
Client Contact: ~~Anna Lundin~~ Molly Reeves	Phone: (720) 273-3436	E-Mail: darlene.bandy@testamericainc.com		Page:
Company: HDR Inc				Job #:

Address: 9781 S. Meridian Blvd Suite 400	Due Date Requested:
City: Englewood	TAT Requested (days):
State, Zip: CO, 80112	
Phone: 734-263-7138(Tel)	PO #: DEN-018
Email: molly.reeves ~~anna.lundin~~@hdrinc.com	WO #:
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371
Site: Colorado	SSOW#:

Analysis Requested

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

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6010C - Boron / 6020A - Calcium (App III)	6020A - 12 Metals (App IV)	9315_Ra226, 9320_Ra228, Ra226Ra228_GFPC	9056A_28D - Cl, S, Fl / 9040B pH	2540C_Calc - TDS	2540D - TSS	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	D	N	N	N		
MW-7	12/10/19	0935	G	W	N	U	X	X	X	X	X	X	7	Sub metals to Canton / Sub RAD to St. Louis
MW-10	12/10/19	1250	G	W	N	N	X	X	X	X	X	X	7	
MW-10D	12/10/19	1255	G	W	N	N	X	X	X	X	X	X	7	
MW-10EB	12/10/19	1150	G	W	N	N	X	X	X	X	X	X	7	
MW-13	12/09/19	1130	G	W	N	N	X	X	X	X	X	X	7	

EM RLR

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	12/10/19 1436	HDR	[signature]	12-10-2019 1436	TAL DEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 3.2, 0.8, CF+0.9, IR8 EM 12/10/19

Ver: 01/16/2019

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-509471.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-131793-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 1/10/2020			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			

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

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPC/ (MOD) Local Method	Total Number of containers	Special Instructions/Note:
				Preservation Code:							
MW-7 (280-131793-1)	12/10/19	09:35 Mountain		Water			X	X	X	2	
MW-10 (280-131793-2)	12/10/19	12:50 Mountain		Water			X	X	X	2	
MW-10D (280-131793-3)	12/10/19	12:55 Mountain		Water			X	X	X	2	
MW-10EB (280-131793-4)	12/10/19	11:50 Mountain		Water			X	X	X	2	
MW-13 (280-131793-5)	12/9/19	11:30 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: [signature]	Date/Time: 12/11/19 1430	Company	Received by: MH	Date/Time: 12-12-19 11:05	Company: TA SL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Eurofins TestAmerica, Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

36 C4.3

Chain of Custody Record

eurofins | Environment Testing TestAmerica

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Bandy, Darlene F	Carrier Tracking No(s):	COC No: 280-509470.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: darlene.bandy@testamericainc.com	State of Origin: Colorado	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-131793-1
Address: 4101 Shuffel Street NW,	Due Date Requested: 1/7/2020	**Analysis Requested**		**Preservation Codes:**
City: North Canton	TAT Requested (days):			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
State, Zip: OH, 44720				M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
Phone: 330-497-9396(Tel) 330-497-0772(Fax)	PO #:			
Email:	WO #:			
Project Name: Xcel Energy GW CCR Monitoring - Cherokee	Project #: 28014371			
Site: Xcel Energy CCR - Cherokee Station	SSOW#:			Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 13 T. Metals (w/collision cell)	6010C/3005A Boron	Total Number of containers	Special Instructions/Note: S85
			Preservation Code:							
MW-7 (280-131793-1)	12/10/19	09:35 Mountain		Water			X	X	2	Use Collision Cell
MW-10 (280-131793-2)	12/10/19	12:50 Mountain		Water			X	X	2	Use Collision Cell
MW-10D (280-131793-3)	12/10/19	12:55 Mountain		Water			X	X	2	Use Collision Cell
MW-10EB (280-131793-4)	12/10/19	11:50 Mountain		Water			X	X	2	Use Collision Cell
MW-13 (280-131793-5)	12/9/19	11:30 Mountain		Water			X	X	2	Use Collision Cell

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

Possible Hazard Identification — *Unconfirmed*	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) — Primary Deliverable Rank: 4	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:		Time:	Method of Shipment:	
Relinquished by: [signature]	Date/Time: 12/11/19 1530	Company	Received by: [signature]	Date/Time: 12-12-19 910	Company: ETAC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		

Ver: 01/16/2019

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # :**
Canton Facility

Client ETA Denver Site Name

Cooler unpacked by:

Cooler Received on 12-12-19 Opened on 12-12-19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time Storage Location

TestAmerica Cooler # 7A Foam Box Client Cooler Box Other

Packing material used: Bubble Wrap Foam Plastic Bag None Other

COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-10 (CF **+0.7** °C) Observed Cooler Temp. 3.6 °C Corrected Cooler Temp. 4.3 °C
   IR GUN #IR-11 (CF **+0.9**°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
   - Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
   - Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
   - Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# **HC995364**
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? ⬤ ⬅ Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____ Yes No
16. Was a LL Hg or Me Hg trip blank present? ____ Yes No

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by:

18. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-131793-1

Login Number: 131793
List Number: 1
Creator: Awolaja, Oluwademilade A

List Source: Eurofins TestAmerica, Denver

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

Login Sample Receipt Checklist

Client: HDR Inc | Job Number: 280-131793-1

Login Number: 131793
List Number: 2
Creator: Hellm, Michael

List Source: Eurofins TestAmerica, St. Louis
List Creation: 12/12/19 02:08 PM

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.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.7
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	

Tracer/Carrier Summary

Client: HDR Inc
Job ID: 280-131793-1
Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

Method: 9315 - Radium-226 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-131793-1	MW-7	70.4
280-131793-2	MW-10	54.0

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)
280-131793-3	MW-10D	92.9
280-131793-4	MW-10EB	106
280-131793-5	MW-13	94.1
LCS 160-454191/1-A	Lab Control Sample	106
LCSD 160-454191/2-A	Lab Control Sample Dup	107
MB 160-454191/12-A	Method Blank	104

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Ground Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-131793-1	MW-7	70.4	89.0
280-131793-2	MW-10	54.0	89.9

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba Carrier (40-110)	Y Carrier (40-110)
280-131793-3	MW-10D	92.9	88.1
280-131793-4	MW-10EB	106	86.9
280-131793-5	MW-13	94.1	88.4
LCS 160-454195/1-A	Lab Control Sample	106	91.4
LCSD 160-454195/2-A	Lab Control Sample Dup	107	88.7
MB 160-454195/12-A	Method Blank	104	88.1

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier