



2018 Annual Groundwater Monitoring and Corrective Action Report

for Compliance with the Coal Combustion
Residuals (CCR) Rule

Cherokee Station

Public Service Company of Colorado



January 30, 2019



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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

2018 Groundwater Monitoring and Corrective Action Annual Report for Cherokee Station

I hereby certify to the best of my knowledge that this groundwater monitoring and corrective action 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.



Matthew Rohr, PE
Colorado PE License 0053467
License renewal date October 31, 2019

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: 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 2018, groundwater monitoring was conducted at Cherokee to collect background samples for the (closed) CTRP. 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 (closed) ash impoundments, detection monitoring water quality data collected in 2017 were compared against the background threshold values (BTVs) as specified under CCR Rule Part 257.94, and groundwater monitoring was conducted for assessment monitoring as specified under Part 257.95. This Annual Groundwater Monitoring Report presents the sampling and analysis completed in 2018:

- The status of the groundwater monitoring program for the (closed) West, Center, and East ash impoundments at the end of 2018 is in assessment monitoring.
- The status of the groundwater monitoring program for the (closed) CTRP at the end of 2018 is in background 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 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 will be certified by a Professional Engineer in early 2019.

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 initially 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 CCR units operation and monitoring 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 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 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 West, Center, and East ash impoundments (**Figure 2**). No ash impoundment monitoring wells were installed or abandoned in 2018.

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 (**Figure 2**).

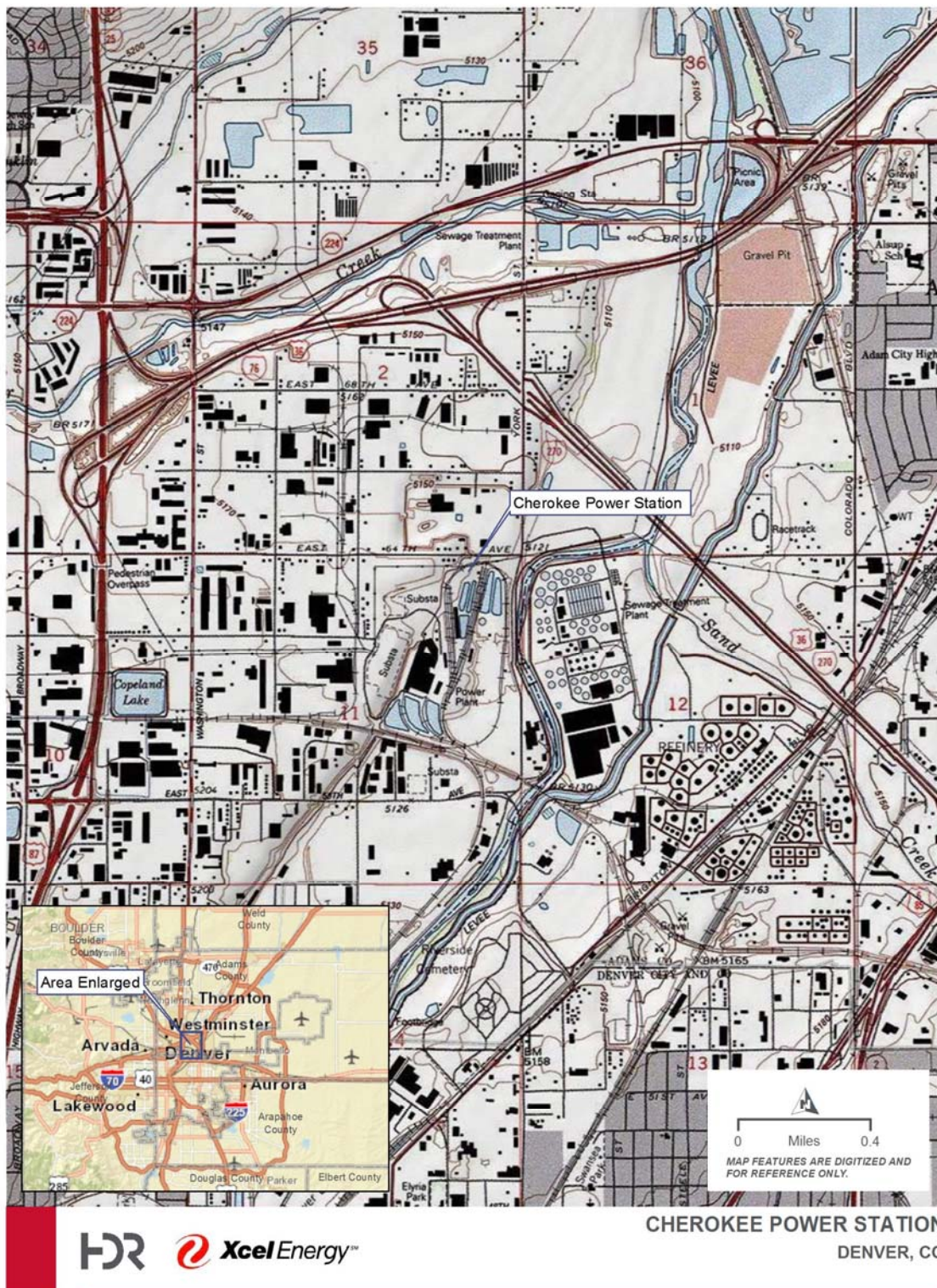


Figure 1. Vicinity map for Cherokee Station.

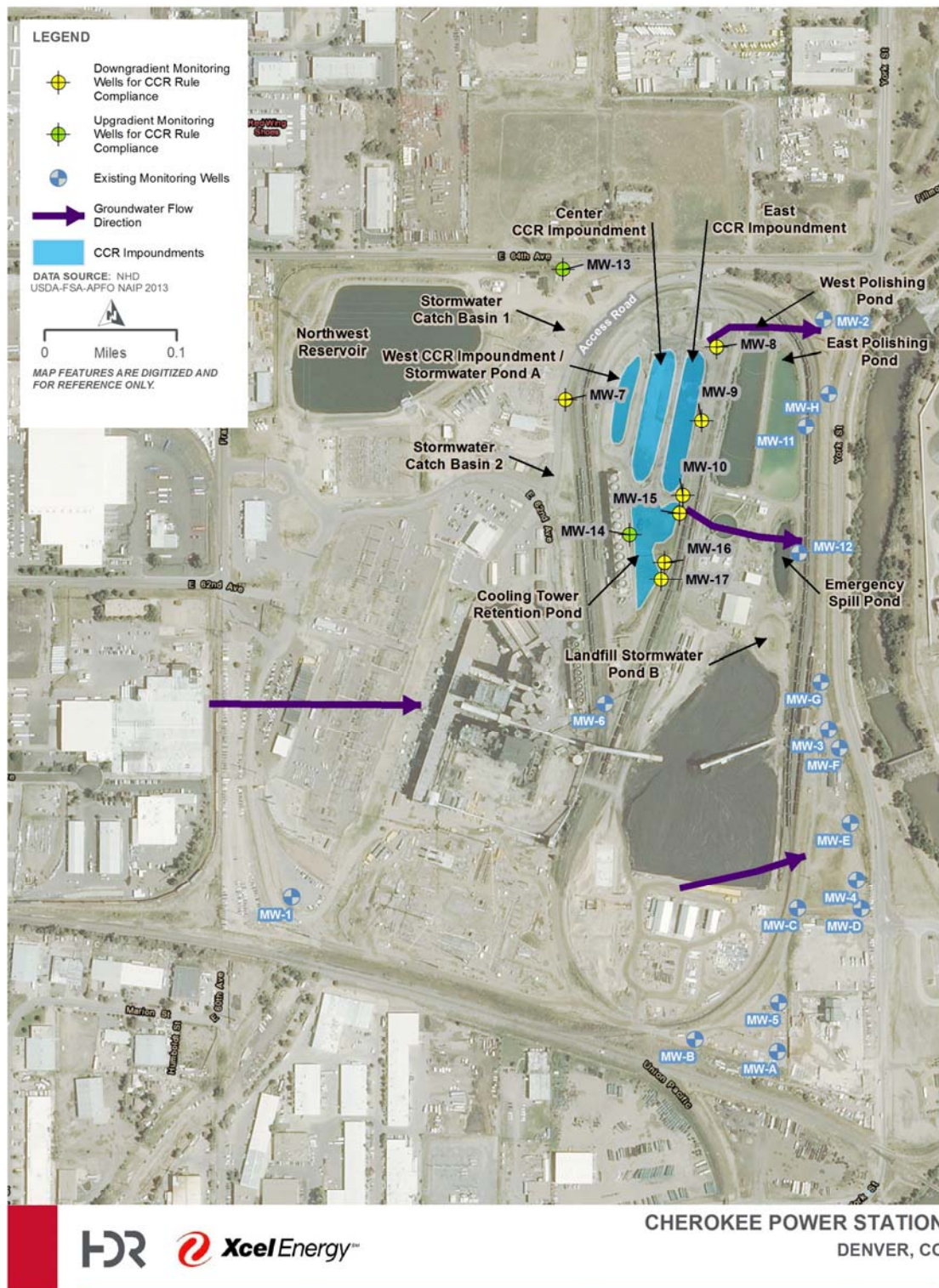


Figure 2. Cherokee Station – CCR unit and monitoring well location map.

3.0 Monitoring

3.1 Frequency

3.1.1 West, Center, and East Ash Impoundments

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 at the ash impoundments were compared against the BTVs and several COIs were shown to have SSIs over BTVs (upper prediction limit). The SSIs triggered the assessment monitoring program for the three ash impoundments. The initial assessment monitoring event was completed March 7, 2018 to sample all of the monitoring wells around the impoundments for Appendix IV constituents (**Table 1**). Samples were collected from the monitoring network of wells (MW-8, MW-9, MW-10, and MW-13; MW-7 was dry). **Table 2** provides the well identification, number of samples collected, dates samples were collected in 2018, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))). **Appendix A** provides distinctions for the different types of monitoring events and the CCR Rule Part under which the monitoring event was conducted. All Appendix IV constituents were detected in at least one well with the exception of beryllium and thallium.

On June 5-7, 2018, the first semi-annual assessment monitoring samples were collected from all five of the ash impoundment monitoring wells. Samples were analyzed for Appendix III and detected Appendix IV COIs plus TSS. **Table 2** provides the well identification, number of samples collected, dates samples were collected in 2018, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))). Closure of the three CCR impoundments was completed in the fourth quarter of 2018. Removal of CCR, and all areas affected by releases of CCR, was completed in December 2018.

On December 12, 2018, the second semi-annual assessment monitoring event was conducted at the ash impoundment wells. Samples were collected from only two of the monitoring network of wells (MW-10 and MW-13; MW-7, MW-8 and MW-9 were all dry). Samples were analyzed for Appendix III and detected Appendix IV COIs plus TSS.



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 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	Dry	Initial Assessment Monitoring
		June 7, 2018	Semi-Annual Assessment Monitoring
		Dry	Semi-Annual Assessment Monitoring
MW-8	Downgradient	March 7, 2018	Initial Assessment Monitoring
		June 7, 2018	Semi-Annual Assessment Monitoring
		Dry	Semi-Annual Assessment Monitoring
MW-9	Downgradient	March 7, 2018	Initial Assessment Monitoring
		June 6, 2018	Semi-Annual Assessment Monitoring
		Dry	Semi-Annual Assessment Monitoring
MW-10	Downgradient	March 7, 2018	Initial Assessment Monitoring
		June 5, 2018	Semi-Annual Assessment Monitoring
		December 12, 2018	Semi-Annual Assessment Monitoring
MW-13	Upgradient / Background	March 7, 2018	Initial Assessment Monitoring
		June 6, 2018	Semi-Annual Assessment Monitoring
		December 12, 2018	Semi-Annual Assessment Monitoring

¹Hydraulically 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), eight rounds of background groundwater sampling were initiated in 2018 for the CTRP, to be completed before April 17, 2019. Sampling was conducted between August 29 and December 27, 2018, for collection of seven samples in 2018. Samples were analyzed for Appendix III and IV COIs plus TSS. **Table 3** provides the well identification, number of samples collected, dates samples were collected in 2018, and whether the sample was required by the detection monitoring or assessment monitoring programs (per (257.90(e)(3))). **Appendix A** provides distinctions for the different types of monitoring events and the CCR Rule Part under which the monitoring event was conducted.

Table 3. Number and dates of groundwater samples collected in 2018 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	Downgradient	August 29, 2018 September 20, 2018 October 10, 2018 October 25, 2018 November 16, 2018 December 11, 2018 December 27, 2018	Background Monitoring (Post-CCR Removal)
MW-15	Downgradient	August 29, 2018 September 20, 2018 October 10, 2018 October 26, 2018 November 16, 2018 December 11, 2018 December 27, 2018	Background Monitoring (Post-CCR Removal)
MW-16	Downgradient	August 29, 2018 September 20, 2018 October 9, 2018 October 25, 2018 November 16, 2018 December 11, 2018 December 27, 2018	Background Monitoring (Post-CCR Removal)
MW-17	Upgradient / Background	August 29, 2018 September 20, 2018 October 9, 2018 October 25, 2018 November 16, 2018 December 11, 2018 December 27, 2018	Background Monitoring (Post-CCR Removal)

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. Initial assessment monitoring, and subsequent annual assessment monitoring samples are analyzed for all

Appendix IV COIs to determine what COIs are detected. The semi-annual assessment monitoring samples are analyzed for all Appendix III and detected Appendix IV COIs. Which COIs were detected is described in Section 4.2. 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) 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 slightly greater than 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. 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 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.

During the periods that the ash impoundments are drained, wells MW-8, MW-9, and MW-7 are dry. This indicates that the water levels in the ash impoundments are controlling the groundwater levels in the monitoring wells surrounding the CCR ponds, which caused groundwater mounding beneath the pond(s).

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 West, Center, and East ash impoundments. The background sampling was described in detail in the *Background Water Quality Statistical Certification* (HDR 2018). 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. 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 February 2018 and consisted of sampling all of the monitoring wells around the ash impoundments for Appendix IV constituents. Laboratory reports are provided in **Appendix C**. The Appendix IV constituents that were not detected in at least one well were beryllium and thallium. The list of detected Appendix IV COIs for future assessment monitoring and for which GPS were established include:

- antimony
- arsenic,
- barium,
- cadmium,
- chromium,
- cobalt,
- fluoride,
- lead,
- lithium,
- molybdenum,
- selenium, and
- combined radium 226/228.

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

On June 6-7, 2018, the second assessment monitoring samples (first semi-annual assessment monitoring sample event) were collected from all of the impoundment wells. Samples were analyzed for Appendix III and detected Appendix IV COIs. Laboratory reports are provided in **Appendix C**. In accordance with CCR Rule 257.95(e), downgradient well concentrations from the second assessment monitoring event 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 to exceed GPS. Therefore, in accordance with CCR Rule 257.95(g), downgradient well concentrations were statistically evaluated to determine “if one or more constituents in appendix IV to this part are detected at statistically significant levels above the groundwater protection standard.” As described in *Groundwater Protection Standards and Determination of no SSLs per 257.95(g)*, **no** downgradient wells were found to have concentrations at SSLs above the GPS. Therefore, in accordance with CCR Rule 257.95(f) PSCo will remain in assessment monitoring at the ash impoundments.

Closure of the 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.

On December 12, 2018, the second semi-annual assessment monitoring samples were collected from the impoundment monitoring wells. Wells MW-7, MW-8, and MW-9 were all dry. This was expected due to the ponds being dry for the ongoing closure excavation. Samples for MW-10 and MW-13 were analyzed for Appendix III and detected Appendix IV COIs. Laboratory reports for this event had not been received as of the end of 2018.

In 2019, PSCo will continue to monitor groundwater in accordance with the assessment monitoring program to evaluate whether clean closure criteria in groundwater have been met.

4.2.2 Cooling Tower Retention Pond

Seven groundwater sampling events of both upgradient and downgradient wells at the CTRP occurred between August 29, 2018 and the end of 2018 for background monitoring. At the CTRP, all four wells (MW-14, MW-15, MW-16, and MW-17) were sampled during the seven events. Groundwater was analyzed for CCR Rule Appendix III and IV COIs plus TSS. Laboratory reports are provided in **Appendix C**. Background monitoring will be completed in early 2019, and statistical evaluation will be conducted to calculate a background threshold value (BTv) for each Appendix III COI before April 17, 2019. The first detection monitoring sampling will occur prior to April 17, 2019, and results will be evaluated to determine if there is an SSI of any Appendix III COI. Closure of the CTRP per 257.102(e)(i) was completed in March 2017, with removal of CCR, and all areas affected by releases of CCR. Therefore it is important to note that all groundwater monitoring at the CTRP reflects post-CCR removal conditions.

5.0 Summary

The following observations are based on CCR Rule compliance monitoring data collected during the 2018 and prior sample events:

West, Center, and East Ash Impoundments

- Detection monitoring data from the ash impoundments was statistically evaluated and SSIs over background were detected at wells MW-7, MW-9, and MW-10.
- The certified well network wells for the impoundments were sampled in March 2018 for the first assessment monitoring event to determine the detected Appendix IV COIs (MW-7 was dry).
- The ash impoundment wells were sampled in June 2018 for the first semi-annual assessment monitoring event.
- GPS were established for all detected Appendix IV constituents.
- Assessment monitoring data from the impoundments was statistically evaluated and no SSLs above the GPS were observed.
- Wells MW-13 and MW-10 were sampled in December 2018 for semi-annual assessment monitoring; and MW-7, MW-8, and MW-9 were all dry in response to the ponds being dry during closure by final CCR removal.
- All CCR waste was removed from the three ash impoundments by December 2018. Groundwater monitoring will continue in 2019 and will evaluate the post-closure groundwater quality.

- Cherokee Station ash impoundments status at the end of 2018 is assessment monitoring. Assessment monitoring will continue in 2019 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.
- Four CCR certified monitoring wells were installed in 2018 to monitor groundwater at the CTRP.
- All of the CCR monitoring wells that make up the certified well network for the CTRP were sampled 7 times between August and December 2018 for background water quality. Background water quality monitoring will continue into 2019.
- Groundwater flow direction under the CTRP is generally to the east.
- Cherokee Station CTRP current status is in background monitoring; however because the pond has been closed all monitoring reflects post-CCR removal groundwater conditions. Once background monitoring has been completed, the CTRP network will transition to detection monitoring and 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, 2018. Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule. Updated January 15, 2018.

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

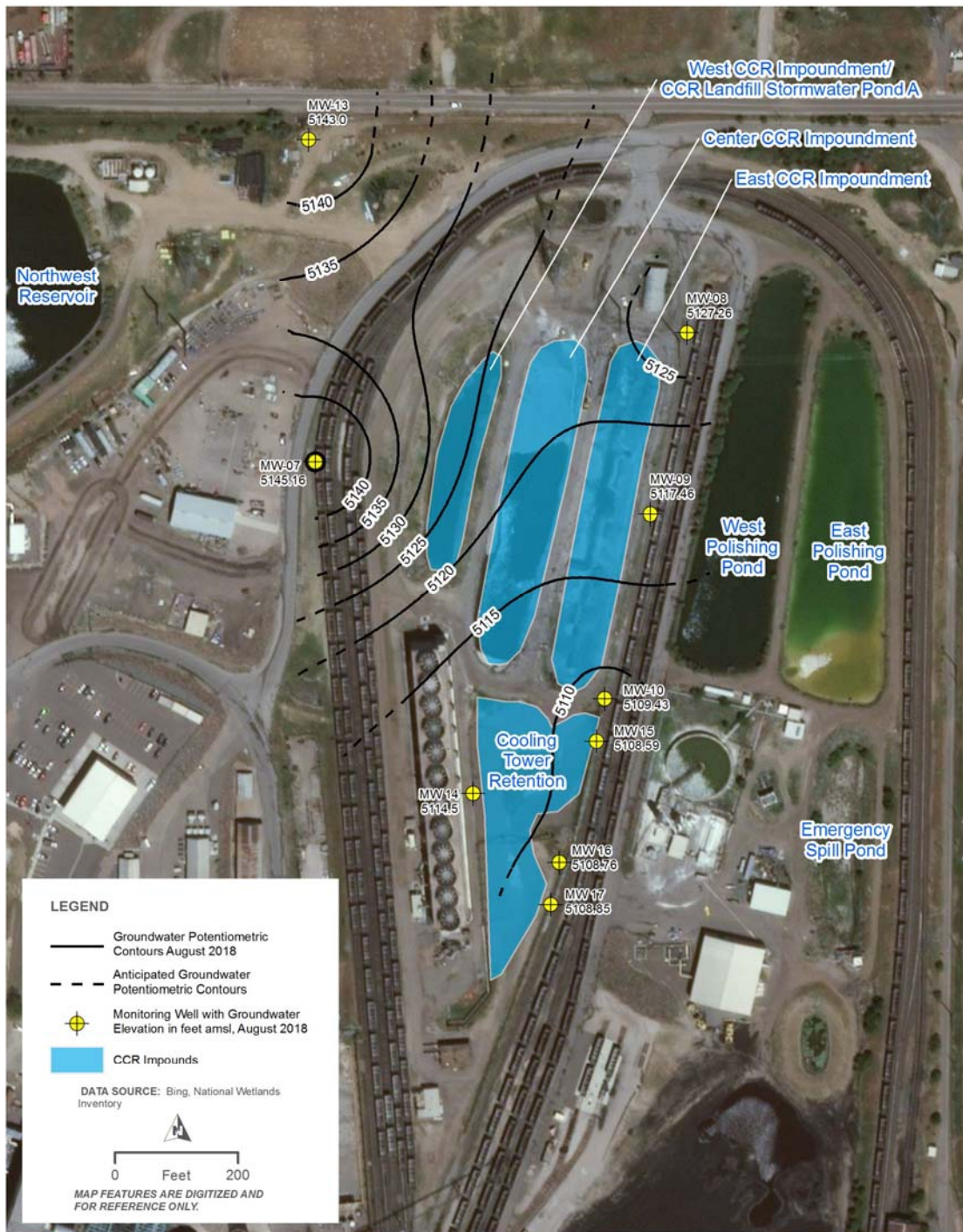
Appendix A

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



CHEROKEE POWER STATION
ADAMS COUNTY, CO

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: 280-107134-1

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:

4/4/2018 4:09:37 PM

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Definitions/Glossary

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

TestAmerica Job ID: 280-107134-1

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.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-107134-1

Job ID: 280-107134-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-107134-1

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 3/8/2018 at 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.2° C, 1.7° C and 4.6° C.

The Dissolved Metals analyses will be reported under SDG 280-107134-2. All other analyses will be reported under SDG 280-107134-1.

TOTAL RECOVERABLE METALS (ICPMS)

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 03/12/2018 and analyzed on 03/15/2018 and 03/16/2018.

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

TOTAL MERCURY

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/09/2018.

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

TOTAL SUSPENDED SOLIDS

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 03/13/2018.

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

ANIONS (28 DAYS)

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 04/02/2018 and 04/03/2018.

Fluoride failed the recovery criteria low for the MS and MSD of sample 280-107426-19 in batch 280-409871. Refer to the QC report for details.

Case Narrative

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

TestAmerica Job ID: 280-107134-1

Job ID: 280-107134-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

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

RADIUM-226 (GFPC)

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 03/13/2018 and analyzed on 04/04/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-355276.

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

RADIUM-228

Samples MW-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 03/13/2018 and analyzed on 03/20/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-355297.

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-8 (280-107134-1), MW-9 (280-107134-2), MW-10 (280-107134-3), MW-13 (280-107134-4), MW-10D (280-107134-5) and MW-7EB (280-107134-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 04/04/2018.

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

TestAmerica Job ID: 280-107134-1

Client Sample ID: MW-8

Lab Sample ID: 280-107134-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Arsenic	0.0030	J	0.0050	0.00075	mg/L	1			6020A	Total Recoverable
Barium	0.046		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Cobalt	0.0038		0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Chromium	0.013		0.0020	0.00098	mg/L	1			6020A	Total Recoverable
Molybdenum	0.011		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Lead	0.00082	J	0.0010	0.00045	mg/L	1			6020A	Total Recoverable
Selenium	0.12		0.0050	0.00089	mg/L	1			6020A	Total Recoverable
Lithium	0.11		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Fluoride	0.94		0.50	0.060	mg/L	1			9056A	Total/NA
Total Suspended Solids	59		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-9

Lab Sample ID: 280-107134-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Antimony	0.0012	J	0.0020	0.00057	mg/L	1			6020A	Total Recoverable
Arsenic	0.0041	J	0.0050	0.00075	mg/L	1			6020A	Total Recoverable
Barium	0.058		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Cadmium	0.0012		0.0010	0.00021	mg/L	1			6020A	Total Recoverable
Cobalt	0.0017		0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Chromium	0.0030		0.0020	0.00098	mg/L	1			6020A	Total Recoverable
Molybdenum	0.020		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Lead	0.0047		0.0010	0.00045	mg/L	1			6020A	Total Recoverable
Selenium	0.0063		0.0050	0.00089	mg/L	1			6020A	Total Recoverable
Lithium	0.073		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Fluoride	1.6		0.50	0.060	mg/L	1			9056A	Total/NA
Total Suspended Solids	36		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 280-107134-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Antimony	0.00078	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	0.077		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Cadmium	0.00026	J	0.0010	0.00021	mg/L	1			6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-107134-1

Client Sample ID: MW-10 (Continued)

Lab Sample ID: 280-107134-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Cobalt	0.00075	J	0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Chromium	0.0027		0.0020	0.00098	mg/L	1			6020A	Total Recoverable
Molybdenum	0.017		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Selenium	0.0035	J	0.0050	0.00089	mg/L	1			6020A	Total Recoverable
Lithium	0.056		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Fluoride	1.1		0.50	0.060	mg/L	1			9056A	Total/NA
Total Suspended Solids	27		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-13

Lab Sample ID: 280-107134-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Barium	0.080		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Cadmium	0.00025	J	0.0010	0.00021	mg/L	1			6020A	Total Recoverable
Cobalt	0.00047	J	0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Chromium	0.0036		0.0020	0.00098	mg/L	1			6020A	Total Recoverable
Molybdenum	0.0031	J	0.010	0.0011	mg/L	1			6020A	Total Recoverable
Lead	0.00080	J	0.0010	0.00045	mg/L	1			6020A	Total Recoverable
Selenium	0.0079		0.0050	0.00089	mg/L	1			6020A	Total Recoverable
Lithium	0.041		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Mercury	0.000030	J	0.00020	0.000027	mg/L	1			7470A	Total/NA
Fluoride	1.3		0.50	0.060	mg/L	1			9056A	Total/NA
Total Suspended Solids	14		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-10D

Lab Sample ID: 280-107134-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Antimony	0.00076	J	0.0020	0.00057	mg/L	1			6020A	Total Recoverable
Arsenic	0.0024	J	0.0050	0.00075	mg/L	1			6020A	Total Recoverable
Barium	0.073		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Cadmium	0.00022	J	0.0010	0.00021	mg/L	1			6020A	Total Recoverable
Cobalt	0.00062	J	0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Chromium	0.0014	J	0.0020	0.00098	mg/L	1			6020A	Total Recoverable
Molybdenum	0.017		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Selenium	0.0041	J	0.0050	0.00089	mg/L	1			6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-107134-1

Client Sample ID: MW-10D (Continued)

Lab Sample ID: 280-107134-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.057		0.0080	0.0017	mg/L	1		6020A	Total
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Recoverable
Total Suspended Solids	51		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-7EB

Lab Sample ID: 280-107134-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	4.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

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

TestAmerica Job ID: 280-107134-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
9056A	Anions, Ion Chromatography	SW846	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

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.
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: 280-107134-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-107134-1	MW-8	Water	03/07/18 15:45	03/08/18 09:00
280-107134-2	MW-9	Water	03/07/18 12:45	03/08/18 09:00
280-107134-3	MW-10	Water	03/07/18 14:40	03/08/18 09:00
280-107134-4	MW-13	Water	03/06/18 10:55	03/08/18 09:00
280-107134-5	MW-10D	Water	03/07/18 14:55	03/08/18 09:00
280-107134-6	MW-7EB	Water	03/06/18 12:40	03/08/18 09:00

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 19:24	1
Arsenic	0.0030	J	0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 19:24	1
Barium	0.046		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 19:24	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 19:24	1
Cadmium	ND		0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 19:24	1
Cobalt	0.0038		0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 19:24	1
Chromium	0.013		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 19:24	1
Molybdenum	0.011		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 19:24	1
Lead	0.00082	J	0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 19:24	1
Selenium	0.12		0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 19:24	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 19:24	1
Lithium	0.11		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 12:24	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0012	J	0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 19:33	1
Arsenic	0.0041	J	0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 19:33	1
Barium	0.058		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 19:33	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 19:33	1
Cadmium	0.0012		0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 19:33	1
Cobalt	0.0017		0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 19:33	1
Chromium	0.0030		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 19:33	1
Molybdenum	0.020		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 19:33	1
Lead	0.0047		0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 19:33	1
Selenium	0.0063		0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 19:33	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 19:33	1
Lithium	0.073		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 12:33	1

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00078	J	0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 19:37	1
Arsenic	0.0023	J	0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 19:37	1
Barium	0.077		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 19:37	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 19:37	1
Cadmium	0.00026	J	0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 19:37	1
Cobalt	0.00075	J	0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 19:37	1
Chromium	0.0027		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 19:37	1
Molybdenum	0.017		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 19:37	1
Lead	ND		0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 19:37	1
Selenium	0.0035	J	0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 19:37	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 19:37	1
Lithium	0.056		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 12:37	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 19:55	1
Arsenic	ND		0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 19:55	1
Barium	0.080		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 19:55	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 19:55	1
Cadmium	0.00025	J	0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 19:55	1
Cobalt	0.00047	J	0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 19:55	1
Chromium	0.0036		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 19:55	1
Molybdenum	0.0031	J	0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 19:55	1
Lead	0.00080	J	0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 19:55	1
Selenium	0.0079		0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 19:55	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 19:55	1
Lithium	0.041		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 12:46	1

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00076	J	0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 20:04	1
Arsenic	0.0024	J	0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 20:04	1
Barium	0.073		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 20:04	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 20:04	1
Cadmium	0.00022	J	0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 20:04	1
Cobalt	0.00062	J	0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 20:04	1
Chromium	0.0014	J	0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 20:04	1
Molybdenum	0.017		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 20:04	1
Lead	ND		0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 20:04	1
Selenium	0.0041	J	0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 20:04	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 20:04	1
Lithium	0.057		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 12:55	1

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 20:13	1
Arsenic	ND		0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 20:13	1
Barium	ND		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 20:13	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 20:13	1
Cadmium	ND		0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 20:13	1
Cobalt	ND		0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 20:13	1
Chromium	ND		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 20:13	1
Molybdenum	ND		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 20:13	1
Lead	ND		0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 20:13	1
Selenium	ND		0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 20:13	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 20:13	1
Lithium	ND		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 13:04	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:26	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:33	1

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:35	1

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000030	J	0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:37	1

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:40	1

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L	-	03/09/18 11:52	03/09/18 20:42	1

General Chemistry

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	0.94		0.50	0.060	mg/L	-		04/03/18 01:29	1
Total Suspended Solids	59		4.0	1.1	mg/L	-		03/13/18 08:23	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.6		0.50	0.060	mg/L	-		04/03/18 02:13	1
Total Suspended Solids	36		4.0	1.1	mg/L	-		03/13/18 08:23	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

General Chemistry

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.1		0.50	0.060	mg/L			04/03/18 03:42	1
Total Suspended Solids	27		4.0	1.1	mg/L			03/13/18 08:23	1

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.3		0.50	0.060	mg/L			04/02/18 15:25	1
Total Suspended Solids	14		4.0	1.1	mg/L			03/13/18 08:23	1

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.1		0.50	0.060	mg/L			04/03/18 04:27	1
Total Suspended Solids	51		4.0	1.1	mg/L			03/13/18 08:23	1

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.060	mg/L			04/02/18 17:12	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			03/13/18 08:23	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.187		0.0746	0.0764	1.00	0.0709	pCi/L	03/13/18 10:51	04/04/18 08:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					03/13/18 10:51	04/04/18 08:48	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0868		0.0615	0.0620	1.00	0.0840	pCi/L	03/13/18 10:51	04/04/18 08:48	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.8		40 - 110					03/13/18 10:51	04/04/18 08:48	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.126		0.0630	0.0640	1.00	0.0686	pCi/L	03/13/18 10:51	04/04/18 08:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110					03/13/18 10:51	04/04/18 08:50	1

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.241		0.0878	0.0904	1.00	0.0870	pCi/L	03/13/18 10:51	04/04/18 08:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.3		40 - 110					03/13/18 10:51	04/04/18 08:51	1

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0674	U	0.0514	0.0517	1.00	0.0701	pCi/L	03/13/18 10:51	04/04/18 08:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.5		40 - 110					03/13/18 10:51	04/04/18 08:51	1

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0227	U	0.0337	0.0338	1.00	0.0581	pCi/L	03/13/18 10:51	04/04/18 08:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					03/13/18 10:51	04/04/18 08:51	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.54		0.312	0.343	1.00	0.334	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					03/13/18 12:19	03/20/18 14:35	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Carrier	%Yield	Qualifier	Limits
Y Carrier	91.2		40 - 110

Prepared	Analyzed	Dil Fac
03/13/18 12:19	03/20/18 14:35	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.332	U	0.248	0.250	1.00	0.391	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	93.8		40 - 110							
Y Carrier	92.7		40 - 110							
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	93.8		40 - 110							
Y Carrier	92.7		40 - 110							

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.951		0.273	0.287	1.00	0.352	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	99.1		40 - 110							
Y Carrier	93.5		40 - 110							
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	99.1		40 - 110							
Y Carrier	93.5		40 - 110							

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.466		0.219	0.224	1.00	0.314	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	97.3		40 - 110							
Y Carrier	93.5		40 - 110							
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	97.3		40 - 110							
Y Carrier	93.5		40 - 110							

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.556		0.239	0.244	1.00	0.340	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	98.5		40 - 110							
Y Carrier	95.7		40 - 110							
Carrier	%Yield	Qualifier	Limits							
Ba Carrier	98.5		40 - 110							
Y Carrier	95.7		40 - 110							

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.156	U	0.156	0.157	1.00	0.312	pCi/L	03/13/18 12:19	03/20/18 14:35	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					03/13/18 12:19	03/20/18 14:35	1
Y Carrier	95.7		40 - 110					03/13/18 12:19	03/20/18 14:35	1

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

Client Sample ID: MW-8
Date Collected: 03/07/18 15:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.73		0.321	0.351	5.00	0.334	pCi/L		04/04/18 16:12	1

Client Sample ID: MW-9
Date Collected: 03/07/18 12:45
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.419		0.256	0.258	5.00	0.391	pCi/L		04/04/18 16:12	1

Client Sample ID: MW-10
Date Collected: 03/07/18 14:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.08		0.280	0.294	5.00	0.352	pCi/L		04/04/18 16:12	1

Client Sample ID: MW-13
Date Collected: 03/06/18 10:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.706		0.236	0.242	5.00	0.314	pCi/L		04/04/18 16:12	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Client Sample ID: MW-10D
Date Collected: 03/07/18 14:55
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.623		0.244	0.249	5.00	0.340	pCi/L		04/04/18 16:12	1

Client Sample ID: MW-7EB
Date Collected: 03/06/18 12:40
Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.133	U	0.160	0.161	5.00	0.312	pCi/L		04/04/18 16:12	1

QC Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-318078/1-A
Matrix: Water
Analysis Batch: 318781

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 318078

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		03/12/18 14:00	03/15/18 18:17	1
Arsenic	ND		0.0050	0.00075	mg/L		03/12/18 14:00	03/15/18 18:17	1
Barium	ND		0.0050	0.0022	mg/L		03/12/18 14:00	03/15/18 18:17	1
Beryllium	ND		0.0010	0.00031	mg/L		03/12/18 14:00	03/15/18 18:17	1
Cadmium	ND		0.0010	0.00021	mg/L		03/12/18 14:00	03/15/18 18:17	1
Cobalt	ND		0.0010	0.00019	mg/L		03/12/18 14:00	03/15/18 18:17	1
Chromium	ND		0.0020	0.00098	mg/L		03/12/18 14:00	03/15/18 18:17	1
Molybdenum	ND		0.010	0.0011	mg/L		03/12/18 14:00	03/15/18 18:17	1
Lead	ND		0.0010	0.00045	mg/L		03/12/18 14:00	03/15/18 18:17	1
Selenium	ND		0.0050	0.00089	mg/L		03/12/18 14:00	03/15/18 18:17	1
Thallium	ND		0.0010	0.00020	mg/L		03/12/18 14:00	03/15/18 18:17	1
Lithium	ND		0.0080	0.0017	mg/L		03/12/18 14:00	03/15/18 18:17	1

Lab Sample ID: MB 240-318078/1-A
Matrix: Water
Analysis Batch: 318907

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 318078

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0080	0.0017	mg/L		03/12/18 14:00	03/16/18 11:30	1

Lab Sample ID: LCS 240-318078/3-A
Matrix: Water
Analysis Batch: 318781

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 318078

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0919		mg/L		92	80 - 120
Arsenic	1.00	0.977		mg/L		98	80 - 120
Barium	1.00	1.00		mg/L		100	80 - 120
Beryllium	1.00	1.15		mg/L		115	80 - 120
Cadmium	1.00	0.966		mg/L		97	80 - 120
Cobalt	1.00	1.04		mg/L		104	80 - 120
Chromium	1.00	0.998		mg/L		100	80 - 120
Molybdenum	0.100	0.103		mg/L		103	80 - 120
Lead	1.00	1.11		mg/L		111	80 - 120
Selenium	1.00	1.01		mg/L		101	80 - 120
Thallium	0.250	0.265		mg/L		106	80 - 120
Lithium	0.100	0.100		mg/L		100	80 - 120

Lab Sample ID: LCS 240-318078/3-A
Matrix: Water
Analysis Batch: 318907

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 318078

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.100	0.0842		mg/L		84	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-407351/1-A
Matrix: Water
Analysis Batch: 407523

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 407351

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/09/18 11:52	03/09/18 19:44	1

Lab Sample ID: LCS 280-407351/2-A
Matrix: Water
Analysis Batch: 407523

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 407351

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00500	0.00534		mg/L		107	84 - 120

Lab Sample ID: 280-107134-1 MS
Matrix: Water
Analysis Batch: 407523

Client Sample ID: MW-8
Prep Type: Total/NA
Prep Batch: 407351

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		0.00500	0.00537		mg/L		107	75 - 125

Lab Sample ID: 280-107134-1 MSD
Matrix: Water
Analysis Batch: 407523

Client Sample ID: MW-8
Prep Type: Total/NA
Prep Batch: 407351

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		0.00500	0.00542		mg/L		108	75 - 125	1	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-409871/6
Matrix: Water
Analysis Batch: 409871

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			04/02/18 13:21	1

Lab Sample ID: LCS 280-409871/4
Matrix: Water
Analysis Batch: 409871

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	5.05		mg/L		101	90 - 110

Lab Sample ID: LCSD 280-409871/5
Matrix: Water
Analysis Batch: 409871

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	5.03		mg/L		101	90 - 110	0	10

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Lab Sample ID: MRL 280-409871/3
Matrix: Water
Analysis Batch: 409871

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.200	0.170	J	mg/L		85	50 - 150

Lab Sample ID: MB 280-409873/6
Matrix: Water
Analysis Batch: 409873

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			04/02/18 12:44	1

Lab Sample ID: LCS 280-409873/4
Matrix: Water
Analysis Batch: 409873

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	5.15		mg/L		103	90 - 110

Lab Sample ID: LCSD 280-409873/5
Matrix: Water
Analysis Batch: 409873

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	5.15		mg/L		103	90 - 110	0	10

Lab Sample ID: MRL 280-409873/3
Matrix: Water
Analysis Batch: 409873

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	0.200	0.174	J	mg/L		87	50 - 150

Lab Sample ID: 280-107134-4 MS
Matrix: Water
Analysis Batch: 409873

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	1.3		5.00	6.36		mg/L		101	80 - 120

Lab Sample ID: 280-107134-4 MSD
Matrix: Water
Analysis Batch: 409873

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	1.3		5.00	6.46		mg/L		103	80 - 120	2	20

Lab Sample ID: 280-107134-4 DU
Matrix: Water
Analysis Batch: 409873

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Fluoride	1.3		1.33		mg/L		1	15

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-107134-1

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

Lab Sample ID: MB 280-407666/1

Matrix: Water

Analysis Batch: 407666

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			03/13/18 08:23	1

Lab Sample ID: LCS 280-407666/2

Matrix: Water

Analysis Batch: 407666

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	90.0		mg/L		90	86 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-355276/9-A

Matrix: Water

Analysis Batch: 358771

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 355276

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01533	U	0.0310	0.0310	1.00	0.0577	pCi/L	03/13/18 10:51	04/04/18 08:51	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110	03/13/18 10:51	04/04/18 08:51	1

Lab Sample ID: LCS 160-355276/1-A

Matrix: Water

Analysis Batch: 358769

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 355276

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	11.02		1.12	1.00	0.0704	pCi/L	93	68 - 137

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	101		40 - 110

Lab Sample ID: LCSD 160-355276/2-A

Matrix: Water

Analysis Batch: 358769

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 355276

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.8	10.26		1.05	1.00	0.0783	pCi/L	87	68 - 137	0.35	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	101		40 - 110

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-107134-1

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-355297/9-A

Matrix: Water

Analysis Batch: 356518

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 355297

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1299	U	0.171	0.171	1.00	0.285	pCi/L	03/13/18 12:19	03/20/18 14:35	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110	03/13/18 12:19	03/20/18 14:35	1
Y Carrier	95.3		40 - 110	03/13/18 12:19	03/20/18 14:35	1

Lab Sample ID: LCS 160-355297/1-A

Matrix: Water

Analysis Batch: 356518

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 355297

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.46	8.888		1.03	1.00	0.376	pCi/L	105	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	101		40 - 110
Y Carrier	95.0		40 - 110

Lab Sample ID: LCSD 160-355297/2-A

Matrix: Water

Analysis Batch: 356518

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 355297

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	8.46	9.136		1.04	1.00	0.379	pCi/L	108	56 - 140	0.12	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	101		40 - 110
Y Carrier	96.1		40 - 110

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-107134-1

Metals

Prep Batch: 318078

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total Recoverable	Water	3005A	
280-107134-2	MW-9	Total Recoverable	Water	3005A	
280-107134-3	MW-10	Total Recoverable	Water	3005A	
280-107134-4	MW-13	Total Recoverable	Water	3005A	
280-107134-5	MW-10D	Total Recoverable	Water	3005A	
280-107134-6	MW-7EB	Total Recoverable	Water	3005A	
MB 240-318078/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-318078/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 318781

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total Recoverable	Water	6020A	318078
280-107134-2	MW-9	Total Recoverable	Water	6020A	318078
280-107134-3	MW-10	Total Recoverable	Water	6020A	318078
280-107134-4	MW-13	Total Recoverable	Water	6020A	318078
280-107134-5	MW-10D	Total Recoverable	Water	6020A	318078
280-107134-6	MW-7EB	Total Recoverable	Water	6020A	318078
MB 240-318078/1-A	Method Blank	Total Recoverable	Water	6020A	318078
LCS 240-318078/3-A	Lab Control Sample	Total Recoverable	Water	6020A	318078

Analysis Batch: 318907

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total Recoverable	Water	6020A	318078
280-107134-2	MW-9	Total Recoverable	Water	6020A	318078
280-107134-3	MW-10	Total Recoverable	Water	6020A	318078
280-107134-4	MW-13	Total Recoverable	Water	6020A	318078
280-107134-5	MW-10D	Total Recoverable	Water	6020A	318078
280-107134-6	MW-7EB	Total Recoverable	Water	6020A	318078
MB 240-318078/1-A	Method Blank	Total Recoverable	Water	6020A	318078
LCS 240-318078/3-A	Lab Control Sample	Total Recoverable	Water	6020A	318078

Prep Batch: 407351

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	7470A	
280-107134-2	MW-9	Total/NA	Water	7470A	
280-107134-3	MW-10	Total/NA	Water	7470A	
280-107134-4	MW-13	Total/NA	Water	7470A	
280-107134-5	MW-10D	Total/NA	Water	7470A	
280-107134-6	MW-7EB	Total/NA	Water	7470A	
MB 280-407351/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-407351/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-107134-1 MS	MW-8	Total/NA	Water	7470A	
280-107134-1 MSD	MW-8	Total/NA	Water	7470A	

Analysis Batch: 407523

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	7470A	407351
280-107134-2	MW-9	Total/NA	Water	7470A	407351
280-107134-3	MW-10	Total/NA	Water	7470A	407351
280-107134-4	MW-13	Total/NA	Water	7470A	407351
280-107134-5	MW-10D	Total/NA	Water	7470A	407351

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-107134-1

Metals (Continued)

Analysis Batch: 407523 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-6	MW-7EB	Total/NA	Water	7470A	407351
MB 280-407351/1-A	Method Blank	Total/NA	Water	7470A	407351
LCS 280-407351/2-A	Lab Control Sample	Total/NA	Water	7470A	407351
280-107134-1 MS	MW-8	Total/NA	Water	7470A	407351
280-107134-1 MSD	MW-8	Total/NA	Water	7470A	407351

General Chemistry

Analysis Batch: 407666

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	SM 2540D	
280-107134-2	MW-9	Total/NA	Water	SM 2540D	
280-107134-3	MW-10	Total/NA	Water	SM 2540D	
280-107134-4	MW-13	Total/NA	Water	SM 2540D	
280-107134-5	MW-10D	Total/NA	Water	SM 2540D	
280-107134-6	MW-7EB	Total/NA	Water	SM 2540D	
MB 280-407666/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-407666/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 409871

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	9056A	
280-107134-2	MW-9	Total/NA	Water	9056A	
280-107134-3	MW-10	Total/NA	Water	9056A	
280-107134-5	MW-10D	Total/NA	Water	9056A	
MB 280-409871/6	Method Blank	Total/NA	Water	9056A	
LCS 280-409871/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-409871/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-409871/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 409873

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-4	MW-13	Total/NA	Water	9056A	
280-107134-6	MW-7EB	Total/NA	Water	9056A	
MB 280-409873/6	Method Blank	Total/NA	Water	9056A	
LCS 280-409873/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-409873/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-409873/3	Lab Control Sample	Total/NA	Water	9056A	
280-107134-4 MS	MW-13	Total/NA	Water	9056A	
280-107134-4 MSD	MW-13	Total/NA	Water	9056A	
280-107134-4 DU	MW-13	Total/NA	Water	9056A	

Rad

Prep Batch: 355276

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	PrecSep-21	
280-107134-2	MW-9	Total/NA	Water	PrecSep-21	
280-107134-3	MW-10	Total/NA	Water	PrecSep-21	
280-107134-4	MW-13	Total/NA	Water	PrecSep-21	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-107134-1

Rad (Continued)

Prep Batch: 355276 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-5	MW-10D	Total/NA	Water	PrecSep-21	
280-107134-6	MW-7EB	Total/NA	Water	PrecSep-21	
MB 160-355276/9-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-355276/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-355276/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 355297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-107134-1	MW-8	Total/NA	Water	PrecSep_0	
280-107134-2	MW-9	Total/NA	Water	PrecSep_0	
280-107134-3	MW-10	Total/NA	Water	PrecSep_0	
280-107134-4	MW-13	Total/NA	Water	PrecSep_0	
280-107134-5	MW-10D	Total/NA	Water	PrecSep_0	
280-107134-6	MW-7EB	Total/NA	Water	PrecSep_0	
MB 160-355297/9-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-355297/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-355297/2-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: 280-107134-1

Client Sample ID: MW-8

Date Collected: 03/07/18 15:45

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-1

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 19:24	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 12:24	DSH	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:26	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409871	04/03/18 01:29	TLP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.77 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358769	04/04/18 08:48	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.77 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-9

Date Collected: 03/07/18 12:45

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-2

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 19:33	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 12:33	DSH	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:33	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409871	04/03/18 02:13	TLP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.74 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358769	04/04/18 08:48	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.74 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-10

Date Collected: 03/07/18 14:40

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 19:37	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 12:37	DSH	TAL CAN

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-107134-1

Client Sample ID: MW-10

Date Collected: 03/07/18 14:40

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:35	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409871	04/03/18 03:42	TLP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.07 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358771	04/04/18 08:50	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.07 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-13

Date Collected: 03/06/18 10:55

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-4

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 19:55	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 12:46	DSH	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:37	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409873	04/02/18 15:25	CCJ	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.81 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358771	04/04/18 08:51	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.81 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-10D

Date Collected: 03/07/18 14:55

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 20:04	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 12:55	DSH	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:40	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409871	04/03/18 04:27	TLP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-107134-1

Client Sample ID: MW-10D

Date Collected: 03/07/18 14:55

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.78 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358771	04/04/18 08:51	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.78 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	TAL SL

Client Sample ID: MW-7EB

Date Collected: 03/06/18 12:40

Date Received: 03/08/18 09:00

Lab Sample ID: 280-107134-6

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	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318781	03/15/18 20:13	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	318078	03/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			318907	03/16/18 13:04	DSH	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	407351	03/09/18 11:52	CDH	TAL DEN
Total/NA	Analysis	7470A		1			407523	03/09/18 20:42	CDH	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	409873	04/02/18 17:12	CCJ	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	407666	03/13/18 08:23	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.97 mL	1.0 g	355276	03/13/18 10:51	JTR	TAL SL
Total/NA	Analysis	9315		1			358771	04/04/18 08:51	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.97 mL	1.0 g	355297	03/13/18 12:19	JTR	TAL SL
Total/NA	Analysis	9320		1			356518	03/20/18 14:35	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			358991	04/04/18 16:12	RTM	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: 280-107134-1

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	01-08-19

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	06-30-18 *
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18 *
New York	NELAP	2	10975	03-31-18 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

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	06-30-18
Arizona	State Program	9	AZ0813	12-08-18
California	State Program	9	2886	03-31-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-18
Illinois	NELAP	5	200023	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-18
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18
Missouri	State Program	7	780	06-30-18
Nevada	State Program	9	MO000542018-1	07-31-18
New Jersey	NELAP	2	MO002	06-30-18 *
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-107134-1

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
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		058448	08-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18
Virginia	NELAP	3	460230	06-14-18
Washington	State Program	10	C592	08-30-18
West Virginia DEP	State Program	3	381	08-31-18 *

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

TestAmerica Denver

Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

THE LEADER IN ENVIRONMENTAL TESTING

[illegible]

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

Chain of Custody Record

Client Information		Sampler	Lab PM	Carrier Tracking No(s)		COC No:
Client Contact:	Anna Lundin	N. Harahan	Robtmeier, Stephanie K			Page: 1 of 1
Company:	HDR Inc	Phone: (507) 250-1774	E-Mail: stephanie.robthmeier@testamericainc.com			Job #:
Address:	9781 S. Meridian Blvd Suite 400	Due Date Requested:	Analysis Requested			
City:	Englewood	TAT Requested (days):	Standard			
State Zip:	CO, 80112	PO #:	DEN-001			
Phone:	720-633-2380(Tel)	WO #:				
Email:	anna.lundin@hdrinc.com	Project #:	28014371			
Project Name:	Xcel Energy GW CCR Monitoring - Cherokee	SSOW#:				
Site:	Colorado					
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=Water, S=solid, O=overhead, B=breast, A=air)	Field Filtered Sample (Yes or No)
MMW-7					Water	N
MMW-8		3/7/18	1545	G	Water	N
MMW-9		3/7/18	1245	G	Water	N
MMW-10		3/7/18	1440	G	Water	N
MMW-13		3/6/18	1055	G	Water	N
Field Duplicate MMW-10D		3/7/18	1455	G	Water	N
Equipment Blank MMW-7EB		3/6/18	1240	G	Water	N
Possible Hazard Identification		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)				
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological		☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months				
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/OC Requirements:				
Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:		
Relinquished by:	3/8/18	0900		Company:	Received by:	Date/Time:
Relinquished by:	3/8/18			Company:	Received by:	Date/Time:
Relinquished by:				Company:	Received by:	Date/Time:
Custody Seal Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:				

Chain of Custody Record

Client Information (Sub Contract Lab) Client Contact: _____ Shipping/Receiving: _____ Company: TestAmerica Laboratories, Inc. Address: 4101 Shuffel Street NW, City: North Canton State: OH, Zip: 44720 Phone: 330-497-9395 (Tel) 330-497-0772 (Fax) Email: _____ Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		Sampler: _____ Lab PM: Rothmeyer, Stephanie K E-Mail: stephanie.rothmeyer@testamericainc.com Phone: _____ State of Origin: Colorado Carrier Tracking No(s): _____ COC No: 280-429579.1 Page: Page 1 of 1 Job #: 280-107134-2	
Due Date Requested: 4/2/2018 TAT Requested (days): _____ PO #: _____ WO #: _____ Project #: 28014371 SSOW#: _____		Analysis Requested Perform MS/MSD (Yes or No) ☒ 6020A/FIELD FLTRD (MOD 13 Metals) ☒ 6010C/FIELD FLTRD (MOD) Copy Analyses ☒ Total Number of Containers: _____	
Sample Identification - Client ID (Lab ID) MW-8 (280-107134-1) MW-9 (280-107134-2) MW-10 (280-107134-3) MW-13 (280-107134-4) MW-10D (280-107134-5)		Sample Date: 3/7/18 Sample Time: 15:45 Matrix: Water Sample Type (C=Comp, G=Grab): _____ Preservation Code: _____ Field Filtered Sample (Yes or No) ☒ 6020A/FIELD FLTRD (MOD 13 Metals) ☒ 6010C/FIELD FLTRD (MOD) Copy Analyses ☒ Total Number of Containers: _____	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/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 _____ Deliverable Requested: I, II, III, IV, Other (specify) _____ Primary Deliverable Rank: 4 Date: _____ Empty Kit Relinquished by: _____ Relinquished by: _____ Relinquished by: _____ Relinquished by: _____ Custody Seal No.: _____ Custody Seals Intact: ☐ Yes ☐ No	
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/OC Requirements: _____		Method of Shipment: _____ Received by: _____ Date/Time: 3/8/18 1530 Company: TW-DEW Received by: _____ Date/Time: _____ Company: _____ Received by: _____ Date/Time: _____ Company: _____ Cooler Temperature(s) °C and Other Remarks: _____	

TestAmerica Canton Sample Receipt Form/Narrative Login # : _____

Canton Facility

Client TA Demo Site Name _____ Cooler unpacked by: [Signature]

Cooler Received on 3/9/18 Opened on 3/9/18

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

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

TestAmerica Cooler # _____ 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

☐ See Multiple Cooler Form

1. Cooler temperature upon receipt

IR GUN# IR-8 (CF -0.3 °C) Observed Cooler Temp. 4.4 °C Corrected Cooler Temp. 4.1 °C

IR GUN #36 (CF +0.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

IR GUN # 627 (CF -1.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____

-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 NA

-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# HC730269

13. Were VOAs on the COC? Yes No NA

14. Were air bubbles >6 mm in any VOA vials? Yes Larger than this.

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

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

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: _____

17. 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)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Chain of Custody Record

Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:
Client Contact:		Phone:	Rollmeyer, Stephanie K		280-429579.1
Shipping/Receiving		E-Mail:	stephanie.rollmeyer@testamericainc.com	State of Origin:	Page: 1 of 1
Company:		Accreditations Required (See note):		Job #:	Job #:
TestAmerica Laboratories, Inc.		NELAP - Oregon		280-107134-1	280-107134-1
Address:		Due Date Requested:	Analysis Requested		
4101 Shuffel Street NW,		4/2/2018	6020A/3005A (MOD) 12 Total Metals (w/collision cell)		
City:	North Canton	TAT Requested (days):	Field Filtered Sample (Yes or No)		
State, Zip:	OH, 44720		Perform MS/MSD (Yes or No)		
Phone:	330-497-9396(Tel) 330-497-0772(Fax)	PO #:	Total Number of Containers		
Email:		WO #:	559		
Project Name:	Xcel Energy GW CCR Monitoring - Cherokee	Project #:	Special Instructions/Note:		
Site:	Xcel Energy CCR - Cherokee Station	28014371	559		
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, B=BI-Tissue, A=Air)
MW-8 (280-107134-1)	3/7/18	15:45	Mountain	Water	Water
MW-9 (280-107134-2)	3/7/18	12:45	Mountain	Water	Water
MW-10 (280-107134-3)	3/7/18	14:40	Mountain	Water	Water
MW-13 (280-107134-4)	3/6/18	10:55	Mountain	Water	Water
MW-10D (280-107134-5)	3/7/18	14:55	Mountain	Water	Water
MW-7EB (280-107134-6)	3/6/18	12:40	Mountain	Water	Water
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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 analyses/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					
Deliverable Requested: I, II, III, IV, Other (specify)					
Primary Deliverable Rank: 4					
Time:					
Date:					
Relinquished by:					
Relinquished by:					
Relinquished by:					
Custody Seal No.:					
Custody Seal Intact:					
Cooler Temperature(s) °C and Other Remarks:					

TestAmerica Canton Sample Receipt Form/Narrative

Login # : _____

Canton Facility

 Client TA Denver Site Name _____ Cooler unpacked by: 202
 Cooler Received on 3/9/18 Opened on 3/9/18
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time _____

Storage Location _____

 TestAmerica Cooler # _____ 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

☐ See Multiple Cooler Form

 1. Cooler temperature upon receipt
 IR GUN# IR-8 (CF -0.3 °C) Observed Cooler Temp. 4.4 °C Corrected Cooler Temp. 4.1 °C
 IR GUN #36 (CF +0.3 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN # 627 (CF -1.3 °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 NA
 -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

 13. Were VOAs on the COC? Yes No

 14. Were air bubbles >6 mm in any VOA vials? Yes No NA

15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____

 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

 pH Strip Lot# HC730269

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

Concerning _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

17. 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)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.

Time preserved: _____ Preservative(s) added/Lot number(s): _____

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-107134-1

Login Number: 107134

List Source: TestAmerica Denver

List Number: 1

Creator: Burtness, Benjamin W

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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.	False	Refer to Job Narrative for details.
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-107134-1

Login Number: 107134

List Number: 3

Creator: Daniels, Brian J

List Source: TestAmerica St. Louis

List Creation: 03/12/18 01:48 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	7.4
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?	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

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

TestAmerica Job ID: 280-107134-1

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)	
280-107134-1	MW-8	98.2	
280-107134-2	MW-9	93.8	
280-107134-3	MW-10	99.1	
280-107134-4	MW-13	97.3	
280-107134-5	MW-10D	98.5	
280-107134-6	MW-7EB	103	
LCS 160-355276/1-A	Lab Control Sample	101	
LCSD 160-355276/2-A	Lab Control Sample Dup	101	
MB 160-355276/9-A	Method Blank	110	
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)
280-107134-1	MW-8	98.2	91.2
280-107134-2	MW-9	93.8	92.7
280-107134-3	MW-10	99.1	93.5
280-107134-4	MW-13	97.3	93.5
280-107134-5	MW-10D	98.5	95.7
280-107134-6	MW-7EB	103	95.7
LCS 160-355297/1-A	Lab Control Sample	101	95.0
LCSD 160-355297/2-A	Lab Control Sample Dup	101	96.1
MB 160-355297/9-A	Method Blank	110	95.3
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

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TestAmerica Job ID: 280-110626-1

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

Revision: 1

For:

HDR Inc

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Denver, Colorado 80202

Attn: Molly Reeves



Authorized for release by:

7/27/2018 1:53:19 PM

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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.

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Definitions/Glossary

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

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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.
H	Sample was prepped or analyzed beyond the specified holding time

General Chemistry

Qualifier	Qualifier Description
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.
F5	Duplicate RPD exceeds limit, and one or both sample results are less than 5 times RL. The data are considered valid because the absolute difference is less than the RL.

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)

Case Narrative

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

TestAmerica Job ID: 280-110626-1

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Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-110626-1

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.

REVISION 1 CHANGES

The report is revised to include all analyses in one report.

RECEIPT

The samples were received on 6/7/2018 at 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 3.0° C, 3.7° C and 4.0° C.

TOTAL RECOVERABLE METALS

Samples MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/23/2018 and analyzed on 07/25/2018.

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 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 06/12/2018 and analyzed on 06/13/2018.

Calcium failed the recovery criteria low for the MS of sample 240-96843-4 in batch 240-331618. 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 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 07/17/2018 and analyzed on 07/18/2018.

The following analysis was requested outside of analytical holding time: MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6), MW-10EB (280-110626-7).

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

Case Narrative

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

TestAmerica Job ID: 280-110626-1

Job ID: 280-110626-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

TOTAL DISSOLVED SOLIDS

Samples MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 06/12/2018 and 06/14/2018.

Total Dissolved Solids (TDS) exceeded the RPD limit for the duplicate of sample MW-10EB (280-110626-7). Sample matrix interference and/or non-homogeneity are suspected.

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

TOTAL SUSPENDED SOLIDS

Samples MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 06/12/2018.

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

CORROSIVITY (PH)

Samples MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 06/26/2018.

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

ANIONS (28 DAYS)

Samples MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 06/30/2018.

Samples MW-8 (280-110626-2)[20X], MW-9 (280-110626-3)[20X], MW-10 (280-110626-4)[20X] and MW-10D (280-110626-6)[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.

RADIUM-226 (GFPC)

Samples MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/12/2018 and analyzed on 07/05/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-369971.

The following samples were reduced due to potential matrix interference: MW-7 (280-110626-1), MW-8 (280-110626-2).

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

RADIUM-228

Samples MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/12/2018 and analyzed on 06/27/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) associated with batch 160-369991.

The following samples were reduced due to potential matrix interference: MW-7 (280-110626-1), MW-8 (280-110626-2).

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

Case Narrative

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

TestAmerica Job ID: 280-110626-1

Job ID: 280-110626-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

RADIUM-226/RADIUM-228 (GFPC)

Samples MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 07/08/2018.

Combined Radium 226 + 228 exceeded the RPD limit for the duplicate of sample 180-78507-4. 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.

Detection Summary

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-7

Lab Sample ID: 280-110626-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.6		0.10	0.023	mg/L	1		6010C	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
Cadmium	0.00029	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0038		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.020		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0081	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Lead	0.010		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Selenium	0.0032	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.048		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	150		1.0	0.58	mg/L	1		6020A	Total Recoverable

Client Sample ID: MW-8

Lab Sample ID: 280-110626-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	4.1		0.10	0.023	mg/L	1		6010C	Total Recoverable
Arsenic	0.00079	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.042		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00025	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Chromium	0.014		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0027		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.00095	J	0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.087		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.012		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.041		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Calcium	350		1.0	0.58	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	21.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	390		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	1.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1300		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2900		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	16		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-9

Lab Sample ID: 280-110626-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1			6010C	Total
Antimony	0.0018	J	0.0020	0.00057	mg/L	1			6020A	Recoverable Total
Arsenic	0.0032	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.083		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Cadmium	0.00071	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Chromium	0.0012	J	0.0020	0.00098	mg/L	1			6020A	Recoverable Total
Cobalt	0.0011		0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Lead	0.00062	J	0.0010	0.00045	mg/L	1			6020A	Recoverable Total
Lithium	0.053		0.0080	0.0017	mg/L	1			6020A	Recoverable Total
Molybdenum	0.035		0.010	0.0011	mg/L	1			6020A	Recoverable Total
Selenium	0.0057		0.0050	0.00089	mg/L	1			6020A	Recoverable Total
Calcium	170		1.0	0.58	mg/L	1			6020A	Recoverable Total
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	20.9	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	310		60	5.1	mg/L	20			9056A	Total/NA
Fluoride	1.8		0.50	0.060	mg/L	1			9056A	Total/NA
Sulfate	640		100	4.6	mg/L	20			9056A	Total/NA
Total Dissolved Solids (TDS)	1600		20	9.4	mg/L	1			SM 2540C	Total/NA
Total Suspended Solids	6.0		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-10

Lab Sample ID: 280-110626-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.73		0.10	0.023	mg/L	1			6010C	Total
Antimony	0.0016	J	0.0020	0.00057	mg/L	1			6020A	Recoverable Total
Arsenic	0.0028	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.12		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Cadmium	0.00034	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Chromium	0.0017	J	0.0020	0.00098	mg/L	1			6020A	Recoverable Total
Cobalt	0.00097	J	0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Lithium	0.070		0.0080	0.0017	mg/L	1			6020A	Recoverable Total
Molybdenum	0.030		0.010	0.0011	mg/L	1			6020A	Recoverable Total
Selenium	0.0032	J	0.0050	0.00089	mg/L	1			6020A	Recoverable Total

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-10 (Continued)

Lab Sample ID: 280-110626-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.4	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	300		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	580		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	1500		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.0		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-13

Lab Sample ID: 280-110626-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.60		0.10	0.023	mg/L	1		6010C	Total Recoverable
Barium	0.074		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Chromium	0.0011	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00037	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.030		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0024	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0027	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Calcium	130		1.0	0.58	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	21.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	150		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	190		5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	930		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-10D

Lab Sample ID: 280-110626-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.72		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	0.0020	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.12		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00033	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Chromium	0.0018	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00096	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-10D (Continued)

Lab Sample ID: 280-110626-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Lithium	0.071		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Molybdenum	0.030		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Selenium	0.0031	J	0.0050	0.00089	mg/L	1			6020A	Total Recoverable
Calcium	180		1.0	0.58	mg/L	1			6020A	Total Recoverable
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	20.7	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	300		60	5.1	mg/L	20			9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1			9056A	Total/NA
Sulfate	580		100	4.6	mg/L	20			9056A	Total/NA
Total Dissolved Solids (TDS)	1500		10	4.7	mg/L	1			SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-10EB

Lab Sample ID: 280-110626-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Barium	0.0032	J	0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Chromium	0.0014	J	0.0020	0.00098	mg/L	1			6020A	Total Recoverable
pH adj. to 25 deg C	6.2	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	21.8	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Total Dissolved Solids (TDS)	10		10	4.7	mg/L	1			SM 2540C	Total/NA
Total Suspended Solids	3.6	J	4.0	1.1	mg/L	1			SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

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

TestAmerica Job ID: 280-110626-1

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: 280-110626-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-110626-1	MW-7	Water	06/07/18 09:00	06/07/18 14:00
280-110626-2	MW-8	Water	06/07/18 10:50	06/07/18 14:00
280-110626-3	MW-9	Water	06/06/18 17:30	06/07/18 14:00
280-110626-4	MW-10	Water	06/05/18 16:35	06/07/18 14:00
280-110626-5	MW-13	Water	06/06/18 10:30	06/07/18 14:00
280-110626-6	MW-10D	Water	06/05/18 16:45	06/07/18 14:00
280-110626-7	MW-10EB	Water	06/05/18 17:30	06/07/18 14:00

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.6		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 17:52	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	4.1		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 17:57	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 18:02	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.73		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 18:07	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.60		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 18:12	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.72		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 18:17	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 18:22	1

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

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 13:40	1
Arsenic	0.0029	J	0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 13:40	1
Barium	0.11		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 13:40	1
Cadmium	0.00029	J	0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 13:40	1
Cobalt	0.0038		0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 13:40	1
Chromium	0.020		0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 13:40	1
Molybdenum	0.0081	J	0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 13:40	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	0.010		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 13:40	1
Selenium	0.0032	J	0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 13:40	1
Lithium	0.048		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 13:40	1
Calcium	150		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 13:40	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 13:45	1
Arsenic	0.00079	J	0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 13:45	1
Barium	0.042		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 13:45	1
Cadmium	0.00025	J	0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 13:45	1
Chromium	0.014		0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 13:45	1
Cobalt	0.0027		0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 13:45	1
Lead	0.00095	J	0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 13:45	1
Lithium	0.087		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 13:45	1
Molybdenum	0.012		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 13:45	1
Selenium	0.041		0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 13:45	1
Calcium	350		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 13:45	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0018	J	0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 13:49	1
Arsenic	0.0032	J	0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 13:49	1
Barium	0.083		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 13:49	1
Cadmium	0.00071	J	0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 13:49	1
Chromium	0.0012	J	0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 13:49	1
Cobalt	0.0011		0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 13:49	1
Lead	0.00062	J	0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 13:49	1
Lithium	0.053		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 13:49	1
Molybdenum	0.035		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 13:49	1
Selenium	0.0057		0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 13:49	1
Calcium	170		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 13:49	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0016	J	0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 14:02	1
Arsenic	0.0028	J	0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 14:02	1
Barium	0.12		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 14:02	1
Cadmium	0.00034	J	0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 14:02	1
Chromium	0.0017	J	0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 14:02	1
Cobalt	0.00097	J	0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 14:02	1
Lead	ND		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 14:02	1
Lithium	0.070		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 14:02	1
Molybdenum	0.030		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 14:02	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.0032	J	0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 14:02	1
Calcium	180		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 14:02	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 14:07	1
Arsenic	ND		0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 14:07	1
Barium	0.074		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 14:07	1
Cadmium	ND		0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 14:07	1
Chromium	0.0011	J	0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 14:07	1
Cobalt	0.00037	J	0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 14:07	1
Lead	ND		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 14:07	1
Lithium	0.030		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 14:07	1
Molybdenum	0.0024	J	0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 14:07	1
Selenium	0.0027	J	0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 14:07	1
Calcium	130		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 14:07	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 14:11	1
Arsenic	0.0020	J	0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 14:11	1
Barium	0.12		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 14:11	1
Cadmium	0.00033	J	0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 14:11	1
Chromium	0.0018	J	0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 14:11	1
Cobalt	0.00096	J	0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 14:11	1
Lead	ND		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 14:11	1
Lithium	0.071		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 14:11	1
Molybdenum	0.030		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 14:11	1
Selenium	0.0031	J	0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 14:11	1
Calcium	180		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 14:11	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 14:16	1
Arsenic	ND		0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 14:16	1
Barium	0.0032	J	0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 14:16	1
Cadmium	ND		0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 14:16	1
Chromium	0.0014	J	0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 14:16	1
Cobalt	ND		0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 14:16	1
Lead	ND		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 14:16	1
Lithium	ND		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 14:16	1
Molybdenum	ND		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 14:16	1
Selenium	ND		0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 14:16	1
Calcium	ND		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 14:16	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 17:58	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:00	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:02	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:04	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:06	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:08	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	-	07/17/18 14:00	07/18/18 18:10	1

General Chemistry

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

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	-		06/26/18 17:22	1
Temperature	21.7	HF	1.0	1.0	Degrees C			06/26/18 17:22	1
Chloride	390		60	5.1	mg/L			06/30/18 02:05	20
Fluoride	1.0		0.50	0.060	mg/L			06/30/18 01:43	1
Sulfate	1300		100	4.6	mg/L			06/30/18 02:05	20
Total Dissolved Solids (TDS)	2900		40	19	mg/L			06/14/18 14:47	1
Total Suspended Solids	16		4.0	1.1	mg/L			06/12/18 09:51	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

General Chemistry

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
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			06/26/18 17:26	1
Temperature	20.9	HF	1.0	1.0	Degrees C			06/26/18 17:26	1
Chloride	310		60	5.1	mg/L			06/30/18 04:41	20
Fluoride	1.8		0.50	0.060	mg/L			06/30/18 04:19	1
Sulfate	640		100	4.6	mg/L			06/30/18 04:41	20
Total Dissolved Solids (TDS)	1600		20	9.4	mg/L			06/12/18 17:13	1
Total Suspended Solids	6.0		4.0	1.1	mg/L			06/12/18 09:51	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU			06/26/18 17:29	1
Temperature	20.4	HF	1.0	1.0	Degrees C			06/26/18 17:29	1
Chloride	300		60	5.1	mg/L			06/30/18 05:25	20
Fluoride	1.2		0.50	0.060	mg/L			06/30/18 05:03	1
Sulfate	580		100	4.6	mg/L			06/30/18 05:25	20
Total Dissolved Solids (TDS)	1500		10	4.7	mg/L			06/12/18 13:46	1
Total Suspended Solids	4.0		4.0	1.1	mg/L			06/12/18 09:51	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

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			06/26/18 17:34	1
Temperature	21.1	HF	1.0	1.0	Degrees C			06/26/18 17:34	1
Chloride	150		3.0	0.25	mg/L			06/30/18 05:47	1
Fluoride	1.2		0.50	0.060	mg/L			06/30/18 05:47	1
Sulfate	190		5.0	0.23	mg/L			06/30/18 05:47	1
Total Dissolved Solids (TDS)	930		20	9.4	mg/L			06/12/18 17:13	1
Total Suspended Solids	2.0	J	4.0	1.1	mg/L			06/12/18 09:51	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU			06/26/18 17:38	1
Temperature	20.7	HF	1.0	1.0	Degrees C			06/26/18 17:38	1
Chloride	300		60	5.1	mg/L			06/30/18 07:39	20
Fluoride	1.2		0.50	0.060	mg/L			06/30/18 06:32	1
Sulfate	580		100	4.6	mg/L			06/30/18 07:39	20
Total Dissolved Solids (TDS)	1500		10	4.7	mg/L			06/12/18 13:46	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			06/12/18 09:51	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.2	HF	0.1	0.1	SU			06/26/18 17:51	1
Temperature	21.8	HF	1.0	1.0	Degrees C			06/26/18 17:51	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

General Chemistry (Continued)

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			06/30/18 08:01	1
Fluoride	ND		0.50	0.060	mg/L			06/30/18 08:01	1
Sulfate	ND		5.0	0.23	mg/L			06/30/18 08:01	1
Total Dissolved Solids (TDS)	10		10	4.7	mg/L			06/12/18 13:46	1
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			06/12/18 09:51	1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.569		0.211	0.217	1.00	0.192	pCi/L	06/12/18 09:33	07/05/18 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.6		40 - 110					06/12/18 09:33	07/05/18 09:21	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.238		0.111	0.113	1.00	0.116	pCi/L	06/12/18 09:33	07/05/18 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.6		40 - 110					06/12/18 09:33	07/05/18 09:21	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.118		0.0728	0.0735	1.00	0.0907	pCi/L	06/12/18 09:33	07/05/18 09:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					06/12/18 09:33	07/05/18 09:21	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.222		0.0883	0.0906	1.00	0.0835	pCi/L	06/12/18 09:33	07/05/18 11:16	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110					06/12/18 09:33	07/05/18 11:16	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.283		0.0995	0.103	1.00	0.0874	pCi/L	06/12/18 09:33	07/05/18 11:16	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110					06/12/18 09:33	07/05/18 11:16	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0957	U	0.0704	0.0710	1.00	0.0989	pCi/L	06/12/18 09:33	07/05/18 12:51	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.9		40 - 110					06/12/18 09:33	07/05/18 12:51	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0299	U	0.0498	0.0499	1.00	0.0879	pCi/L	06/12/18 09:33	07/05/18 12:52	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		40 - 110					06/12/18 09:33	07/05/18 12:52	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.732	U	0.570	0.574	1.00	0.898	pCi/L	06/12/18 10:31	06/27/18 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.6		40 - 110					06/12/18 10:31	06/27/18 09:49	1
Y Carrier	81.1		40 - 110					06/12/18 10:31	06/27/18 09:49	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.566		0.312	0.316	1.00	0.463	pCi/L	06/12/18 10:31	06/27/18 09:49	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.6		40 - 110	06/12/18 10:31	06/27/18 09:49	1
Y Carrier	91.6		40 - 110	06/12/18 10:31	06/27/18 09:49	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.303	U	0.272	0.274	1.00	0.439	pCi/L	06/12/18 10:31	06/27/18 09:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	88.5		40 - 110					06/12/18 10:31	06/27/18 09:49	1
Y Carrier	89.0		40 - 110					06/12/18 10:31	06/27/18 09:49	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.794		0.298	0.307	1.00	0.420	pCi/L	06/12/18 10:31	06/27/18 09:57	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		40 - 110					06/12/18 10:31	06/27/18 09:57	1
Y Carrier	90.5		40 - 110					06/12/18 10:31	06/27/18 09:57	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.400	U	0.300	0.302	1.00	0.476	pCi/L	06/12/18 10:31	06/27/18 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		40 - 110					06/12/18 10:31	06/27/18 09:59	1
Y Carrier	87.1		40 - 110					06/12/18 10:31	06/27/18 09:59	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.580		0.318	0.323	1.00	0.488	pCi/L	06/12/18 10:31	06/27/18 09:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.9		40 - 110					06/12/18 10:31	06/27/18 09:59	1
Y Carrier	85.2		40 - 110					06/12/18 10:31	06/27/18 09:59	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.303	U	0.268	0.270	1.00	0.431	pCi/L	06/12/18 10:31	06/27/18 10:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		40 - 110					06/12/18 10:31	06/27/18 10:00	1
Y Carrier	84.1		40 - 110					06/12/18 10:31	06/27/18 10:00	1

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

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.30		0.608	0.614	5.00	0.898	pCi/L		07/08/18 16:53	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.804		0.331	0.336	5.00	0.463	pCi/L		07/08/18 16:53	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.421	U	0.282	0.284	5.00	0.439	pCi/L		07/08/18 16:53	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.02		0.311	0.320	5.00	0.420	pCi/L		07/08/18 16:53	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.683		0.316	0.319	5.00	0.476	pCi/L		07/08/18 16:53	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.675		0.326	0.331	5.00	0.488	pCi/L		07/08/18 16:53	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.333	U	0.273	0.275	5.00	0.431	pCi/L		07/08/18 16:53	1

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-337516/1-A
Matrix: Water
Analysis Batch: 337940

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 337516

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		07/23/18 14:00	07/25/18 15:54	1

Lab Sample ID: LCS 240-337516/2-A
Matrix: Water
Analysis Batch: 337940

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 337516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.10		mg/L		110	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-331210/1-A
Matrix: Water
Analysis Batch: 331618

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 331210

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		06/12/18 14:00	06/13/18 12:15	1
Arsenic	ND		0.0050	0.00075	mg/L		06/12/18 14:00	06/13/18 12:15	1
Barium	ND		0.0050	0.0022	mg/L		06/12/18 14:00	06/13/18 12:15	1
Cadmium	ND		0.0010	0.00021	mg/L		06/12/18 14:00	06/13/18 12:15	1
Chromium	ND		0.0020	0.00098	mg/L		06/12/18 14:00	06/13/18 12:15	1
Cobalt	ND		0.0010	0.00019	mg/L		06/12/18 14:00	06/13/18 12:15	1
Lead	ND		0.0010	0.00045	mg/L		06/12/18 14:00	06/13/18 12:15	1
Molybdenum	ND		0.010	0.0011	mg/L		06/12/18 14:00	06/13/18 12:15	1
Lithium	ND		0.0080	0.0017	mg/L		06/12/18 14:00	06/13/18 12:15	1
Selenium	ND		0.0050	0.00089	mg/L		06/12/18 14:00	06/13/18 12:15	1
Calcium	ND		1.0	0.58	mg/L		06/12/18 14:00	06/13/18 12:15	1

Lab Sample ID: LCS 240-331210/2-A
Matrix: Water
Analysis Batch: 331618

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 331210

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0972		mg/L		97	80 - 120
Arsenic	1.00	0.976		mg/L		98	80 - 120
Barium	1.00	0.963		mg/L		96	80 - 120
Cadmium	1.00	1.01		mg/L		101	80 - 120
Chromium	1.00	1.00		mg/L		100	80 - 120
Cobalt	1.00	1.06		mg/L		106	80 - 120
Lead	1.00	1.02		mg/L		102	80 - 120
Molybdenum	0.100	0.0977		mg/L		98	80 - 120
Lithium	0.100	0.0895		mg/L		89	80 - 120
Selenium	1.00	1.00		mg/L		100	80 - 120
Calcium	10.0	9.80		mg/L		98	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-336604/1-A
Matrix: Water
Analysis Batch: 336998

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 336604

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/17/18 14:00	07/18/18 17:23	1

Lab Sample ID: LCS 240-336604/2-A
Matrix: Water
Analysis Batch: 336998

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 336604

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.70		ug/L		94	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-420167/4
Matrix: Water
Analysis Batch: 420167

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 280-420573/6
Matrix: Water
Analysis Batch: 420573

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	0.25	mg/L			06/29/18 17:49	1
Fluoride	ND		0.50	0.060	mg/L			06/29/18 17:49	1
Sulfate	ND		5.0	0.23	mg/L			06/29/18 17:49	1

Lab Sample ID: LCS 280-420573/4
Matrix: Water
Analysis Batch: 420573

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	97.3		mg/L		97	90 - 110
Fluoride	5.00	5.08		mg/L		102	90 - 110
Sulfate	100	96.4		mg/L		96	90 - 110

Lab Sample ID: LCSD 280-420573/5
Matrix: Water
Analysis Batch: 420573

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	97.3		mg/L		97	90 - 110	0	10
Fluoride	5.00	5.10		mg/L		102	90 - 110	0	10
Sulfate	100	96.4		mg/L		96	90 - 110	0	10

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Lab Sample ID: MRL 280-420573/3

Matrix: Water

Analysis Batch: 420573

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.48	J	mg/L		99	50 - 150
Fluoride	0.200	0.205	J	mg/L		102	50 - 150
Sulfate	2.50	2.16	J	mg/L		87	50 - 150

Lab Sample ID: 280-110626-2 MS

Matrix: Water

Analysis Batch: 420573

Client Sample ID: MW-8

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	390		500	884		mg/L		99	80 - 120
Fluoride	ND		100	96.2		mg/L		96	80 - 120
Sulfate	1300		500	1740		mg/L		90	80 - 120

Lab Sample ID: 280-110626-2 MSD

Matrix: Water

Analysis Batch: 420573

Client Sample ID: MW-8

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	390		500	887		mg/L		99	80 - 120	0	20
Fluoride	ND		100	97.4		mg/L		97	80 - 120	1	20
Sulfate	1300		500	1740		mg/L		91	80 - 120	0	20

Lab Sample ID: 280-110626-2 DU

Matrix: Water

Analysis Batch: 420573

Client Sample ID: MW-8

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	390		384		mg/L		2	15
Fluoride	ND		ND		mg/L		NC	15
Sulfate	1300		1260		mg/L		2	15

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

Lab Sample ID: MB 280-418284/1

Matrix: Water

Analysis Batch: 418284

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			06/12/18 13:46	1

Lab Sample ID: LCS 280-418284/2

Matrix: Water

Analysis Batch: 418284

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	490		mg/L		98	86 - 110

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Lab Sample ID: 280-110626-7 DU

Matrix: Water

Analysis Batch: 418284

Client Sample ID: MW-10EB

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	10		12.0	F5	mg/L		18	10

Lab Sample ID: MB 280-418311/1

Matrix: Water

Analysis Batch: 418311

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			06/12/18 17:13	1

Lab Sample ID: LCS 280-418311/2

Matrix: Water

Analysis Batch: 418311

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	498		mg/L		100	86 - 110

Lab Sample ID: MB 280-418638/1

Matrix: Water

Analysis Batch: 418638

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		20	9.4	mg/L			06/14/18 14:47	1

Lab Sample ID: LCS 280-418638/2

Matrix: Water

Analysis Batch: 418638

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	468		mg/L		94	86 - 110

Lab Sample ID: 280-110626-2 DU

Matrix: Water

Analysis Batch: 418638

Client Sample ID: MW-8

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	2900		2980		mg/L		1	10

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

Lab Sample ID: MB 280-418237/1

Matrix: Water

Analysis Batch: 418237

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			06/12/18 09:51	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Lab Sample ID: LCS 280-418237/2
Matrix: Water
Analysis Batch: 418237

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	102		mg/L		102	86 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-369971/23-A
Matrix: Water
Analysis Batch: 374197

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 369971

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02230	U	0.0541	0.0541	1.00	0.0999	pCi/L	06/12/18 09:33	07/05/18 21:46	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	87.0		40 - 110					06/12/18 09:33	07/05/18 21:46	1

Lab Sample ID: LCS 160-369971/1-A
Matrix: Water
Analysis Batch: 374197

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 369971

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.8	9.791		1.03	1.00	0.0872	pCi/L	83	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	92.3		40 - 110						

Lab Sample ID: LCSD 160-369971/2-A
Matrix: Water
Analysis Batch: 374197

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 369971

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.8	10.94		1.13	1.00	0.0987	pCi/L	93	68 - 137	0.53	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	90.3		40 - 110								

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-369991/23-A
Matrix: Water
Analysis Batch: 372811

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 369991

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1348	U	0.242	0.242	1.00	0.410	pCi/L	06/12/18 10:31	06/27/18 10:00	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-110626-1

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

Lab Sample ID: MB 160-369991/23-A
Matrix: Water
Analysis Batch: 372811

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 369991

Carrier	MB %Yield	MB Qualifier	Limits
Ba Carrier	87.0		40 - 110
Y Carrier	89.0		40 - 110

Prepared	Analyzed	Dil Fac
06/12/18 10:31	06/27/18 10:00	1
06/12/18 10:31	06/27/18 10:00	1

Lab Sample ID: LCS 160-369991/1-A
Matrix: Water
Analysis Batch: 372855

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 369991

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	8.19	7.543		0.922	1.00	0.407	pCi/L	92	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	92.3		40 - 110
Y Carrier	88.2		40 - 110

Lab Sample ID: LCSD 160-369991/2-A
Matrix: Water
Analysis Batch: 372855

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 369991

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	8.19	8.499		1.02	1.00	0.444	pCi/L	104	56 - 140	0.49	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	90.3		40 - 110
Y Carrier	88.6		40 - 110

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-110626-1

Metals

Prep Batch: 331210

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total Recoverable	Water	3005A	
280-110626-2	MW-8	Total Recoverable	Water	3005A	
280-110626-3	MW-9	Total Recoverable	Water	3005A	
280-110626-4	MW-10	Total Recoverable	Water	3005A	
280-110626-5	MW-13	Total Recoverable	Water	3005A	
280-110626-6	MW-10D	Total Recoverable	Water	3005A	
280-110626-7	MW-10EB	Total Recoverable	Water	3005A	
MB 240-331210/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-331210/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 331618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total Recoverable	Water	6020A	331210
280-110626-2	MW-8	Total Recoverable	Water	6020A	331210
280-110626-3	MW-9	Total Recoverable	Water	6020A	331210
280-110626-4	MW-10	Total Recoverable	Water	6020A	331210
280-110626-5	MW-13	Total Recoverable	Water	6020A	331210
280-110626-6	MW-10D	Total Recoverable	Water	6020A	331210
280-110626-7	MW-10EB	Total Recoverable	Water	6020A	331210
MB 240-331210/1-A	Method Blank	Total Recoverable	Water	6020A	331210
LCS 240-331210/2-A	Lab Control Sample	Total Recoverable	Water	6020A	331210

Prep Batch: 336604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	7470A	
280-110626-2	MW-8	Total/NA	Water	7470A	
280-110626-3	MW-9	Total/NA	Water	7470A	
280-110626-4	MW-10	Total/NA	Water	7470A	
280-110626-5	MW-13	Total/NA	Water	7470A	
280-110626-6	MW-10D	Total/NA	Water	7470A	
280-110626-7	MW-10EB	Total/NA	Water	7470A	
MB 240-336604/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-336604/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 336998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	7470A	336604
280-110626-2	MW-8	Total/NA	Water	7470A	336604
280-110626-3	MW-9	Total/NA	Water	7470A	336604
280-110626-4	MW-10	Total/NA	Water	7470A	336604
280-110626-5	MW-13	Total/NA	Water	7470A	336604
280-110626-6	MW-10D	Total/NA	Water	7470A	336604
280-110626-7	MW-10EB	Total/NA	Water	7470A	336604
MB 240-336604/1-A	Method Blank	Total/NA	Water	7470A	336604
LCS 240-336604/2-A	Lab Control Sample	Total/NA	Water	7470A	336604

Prep Batch: 337516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total Recoverable	Water	3005A	
280-110626-2	MW-8	Total Recoverable	Water	3005A	
280-110626-3	MW-9	Total Recoverable	Water	3005A	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-110626-1

Metals (Continued)

Prep Batch: 337516 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-4	MW-10	Total Recoverable	Water	3005A	
280-110626-5	MW-13	Total Recoverable	Water	3005A	
280-110626-6	MW-10D	Total Recoverable	Water	3005A	
280-110626-7	MW-10EB	Total Recoverable	Water	3005A	
MB 240-337516/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-337516/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 337940

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total Recoverable	Water	6010C	337516
280-110626-2	MW-8	Total Recoverable	Water	6010C	337516
280-110626-3	MW-9	Total Recoverable	Water	6010C	337516
280-110626-4	MW-10	Total Recoverable	Water	6010C	337516
280-110626-5	MW-13	Total Recoverable	Water	6010C	337516
280-110626-6	MW-10D	Total Recoverable	Water	6010C	337516
280-110626-7	MW-10EB	Total Recoverable	Water	6010C	337516
MB 240-337516/1-A	Method Blank	Total Recoverable	Water	6010C	337516
LCS 240-337516/2-A	Lab Control Sample	Total Recoverable	Water	6010C	337516

General Chemistry

Analysis Batch: 418237

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-2	MW-8	Total/NA	Water	SM 2540D	
280-110626-3	MW-9	Total/NA	Water	SM 2540D	
280-110626-4	MW-10	Total/NA	Water	SM 2540D	
280-110626-5	MW-13	Total/NA	Water	SM 2540D	
280-110626-6	MW-10D	Total/NA	Water	SM 2540D	
280-110626-7	MW-10EB	Total/NA	Water	SM 2540D	
MB 280-418237/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-418237/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 418284

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-4	MW-10	Total/NA	Water	SM 2540C	
280-110626-6	MW-10D	Total/NA	Water	SM 2540C	
280-110626-7	MW-10EB	Total/NA	Water	SM 2540C	
MB 280-418284/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-418284/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-110626-7 DU	MW-10EB	Total/NA	Water	SM 2540C	

Analysis Batch: 418311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-3	MW-9	Total/NA	Water	SM 2540C	
280-110626-5	MW-13	Total/NA	Water	SM 2540C	
MB 280-418311/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-418311/2	Lab Control Sample	Total/NA	Water	SM 2540C	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-110626-1

General Chemistry (Continued)

Analysis Batch: 418638

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-2	MW-8	Total/NA	Water	SM 2540C	
MB 280-418638/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-418638/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-110626-2 DU	MW-8	Total/NA	Water	SM 2540C	

Analysis Batch: 420167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-2	MW-8	Total/NA	Water	9040B	
280-110626-3	MW-9	Total/NA	Water	9040B	
280-110626-4	MW-10	Total/NA	Water	9040B	
280-110626-5	MW-13	Total/NA	Water	9040B	
280-110626-6	MW-10D	Total/NA	Water	9040B	
280-110626-7	MW-10EB	Total/NA	Water	9040B	
LCS 280-420167/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 420573

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-2	MW-8	Total/NA	Water	9056A	
280-110626-2	MW-8	Total/NA	Water	9056A	
280-110626-3	MW-9	Total/NA	Water	9056A	
280-110626-3	MW-9	Total/NA	Water	9056A	
280-110626-4	MW-10	Total/NA	Water	9056A	
280-110626-4	MW-10	Total/NA	Water	9056A	
280-110626-5	MW-13	Total/NA	Water	9056A	
280-110626-6	MW-10D	Total/NA	Water	9056A	
280-110626-6	MW-10D	Total/NA	Water	9056A	
280-110626-7	MW-10EB	Total/NA	Water	9056A	
MB 280-420573/6	Method Blank	Total/NA	Water	9056A	
LCS 280-420573/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-420573/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-420573/3	Lab Control Sample	Total/NA	Water	9056A	
280-110626-2 MS	MW-8	Total/NA	Water	9056A	
280-110626-2 MSD	MW-8	Total/NA	Water	9056A	
280-110626-2 DU	MW-8	Total/NA	Water	9056A	

Rad

Prep Batch: 369971

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	PrecSep-21	
280-110626-2	MW-8	Total/NA	Water	PrecSep-21	
280-110626-3	MW-9	Total/NA	Water	PrecSep-21	
280-110626-4	MW-10	Total/NA	Water	PrecSep-21	
280-110626-5	MW-13	Total/NA	Water	PrecSep-21	
280-110626-6	MW-10D	Total/NA	Water	PrecSep-21	
280-110626-7	MW-10EB	Total/NA	Water	PrecSep-21	
MB 160-369971/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-369971/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-369971/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-110626-1

Rad (Continued)

Prep Batch: 369991

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	PrecSep_0	
280-110626-2	MW-8	Total/NA	Water	PrecSep_0	
280-110626-3	MW-9	Total/NA	Water	PrecSep_0	
280-110626-4	MW-10	Total/NA	Water	PrecSep_0	
280-110626-5	MW-13	Total/NA	Water	PrecSep_0	
280-110626-6	MW-10D	Total/NA	Water	PrecSep_0	
280-110626-7	MW-10EB	Total/NA	Water	PrecSep_0	
MB 160-369991/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-369991/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-369991/2-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: 280-110626-1

Client Sample ID: MW-7

Date Collected: 06/07/18 09:00

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 17:52	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 13:40	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 17:58	AJC	TAL CAN
Total/NA	Prep	PrecSep-21			500.13 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374197	07/05/18 09:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			500.13 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372855	06/27/18 09:49	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

Client Sample ID: MW-8

Date Collected: 06/07/18 10:50

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 17:57	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 13:45	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:00	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:22	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 01:43	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	420573	06/30/18 02:05	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	418638	06/14/18 14:47	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			749.57 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374197	07/05/18 09:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			749.57 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372855	06/27/18 09:49	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

Client Sample ID: MW-9

Date Collected: 06/06/18 17:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 18:02	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-9

Date Collected: 06/06/18 17:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Analysis	6020A		1			331618	06/13/18 13:49	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:02	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:26	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 04:19	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	420573	06/30/18 04:41	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	418311	06/12/18 17:13	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.40 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374197	07/05/18 09:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.40 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372855	06/27/18 09:49	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

Client Sample ID: MW-10

Date Collected: 06/05/18 16:35

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 18:07	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 14:02	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:04	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:29	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 05:03	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	420573	06/30/18 05:25	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	418284	06/12/18 13:46	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.80 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374197	07/05/18 11:16	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.80 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372811	06/27/18 09:57	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

Client Sample ID: MW-13

Date Collected: 06/06/18 10:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5

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	337516	07/23/18 14:00	MBB	TAL CAN

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-13

Date Collected: 06/06/18 10:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Analysis	6010C		1			337940	07/25/18 18:12	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 14:07	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:06	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:34	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 05:47	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	418311	06/12/18 17:13	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.29 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374197	07/05/18 11:16	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.29 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372811	06/27/18 09:59	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

Client Sample ID: MW-10D

Date Collected: 06/05/18 16:45

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 18:17	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 14:11	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:08	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:38	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 06:32	TLP	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	420573	06/30/18 07:39	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	418284	06/12/18 13:46	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.34 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1			374196	07/05/18 12:51	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.34 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372811	06/27/18 09:59	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-110626-1

Client Sample ID: MW-10EB

Lab Sample ID: 280-110626-7

Date Collected: 06/05/18 17:30

Matrix: Water

Date Received: 06/07/18 14:00

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	337516	07/23/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			337940	07/25/18 18:22	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	331210	06/12/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			331618	06/13/18 14:16	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:10	AJC	TAL CAN
Total/NA	Analysis	9040B		1			420167	06/26/18 17:51	LPL	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	420573	06/30/18 08:01	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	50 mL	418284	06/12/18 13:46	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	418237	06/12/18 09:51	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.11 mL	1.0 g	369971	06/12/18 09:33	JLC	TAL SL
Total/NA	Analysis	9315		1	1.0 mL	1.0 mL	374196	07/05/18 12:52	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.11 mL	1.0 g	369991	06/12/18 10:31	JLC	TAL SL
Total/NA	Analysis	9320		1			372811	06/27/18 10:00	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			374406	07/08/18 16:53	RTM	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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-110626-1

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	01-08-19
The following analytes are included in this report, but are not accredited/certified under this accreditation/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	07-31-18 *
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

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 ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
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	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-18 *
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-18 *
Nevada	State Program	9	MO000542018-1	07-31-18 *

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-110626-1

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
New Jersey	NELAP	2	MO002	06-30-19
New York	NELAP	2	11616	03-31-19
North Dakota	State Program	8	R207	06-30-18 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-18 *
Pennsylvania	NELAP	3	68-00540	02-28-19
South Carolina	State Program	4	85002001	06-30-18 *
Texas	NELAP	6	T104704193-17-11	07-31-18 *
US Fish & Wildlife	Federal		058448	07-31-18
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-18 *
West Virginia DEP	State Program	3	381	08-31-18 *

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

TestAmerica Denver

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		Sampler: <i>N. Hanrahan</i>		Lab #/E-Mail: <i>Stephanie Rothmeyer@testamericainc.com</i>		Garner Tracking No(s):		COC No: <i>Page 1 of 1</i>	
Client Contact: Anna Lundin		Phone: <i>720-633-2380 (Tel)</i>		E-Mail: <i>anna.lundin@hdrinc.com</i>					
Company: HDR Inc		Address: 9781 S. Meridian Blvd Suite 400		City: Englewood		State: CO, 80112		Country: USA	
Due Date Requested:		TAT Requested (days):		Standard					
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		Project #: 28014371		SSOW#: <i>280-110626</i>					
Site: Colorado		Sample Date: <i>6/7/18</i>		Sample Time: <i>0900</i>		Sample Type: <i>G</i>		Matrix: <i>Water</i>	
Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		2540C - Total Dissolved Solids (TDS)		Dissolved Metals - 6020A, 7470A <i>Total Metals</i>		pH - 9040B, Anions - 9056A_28D	
2540D - Total Suspended Solids		9315_Ra226, 9320_Ra228, Ra226Ra228_GFPC							
Total Number of containers		All App 3 Parameters		Metals: <i>Sb, As, Ba, Cd, Cr, Co, F, Pb, Li, Mo, Se</i>		Special Instructions/Note:			
Preservation Codes:		A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - NaOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDTA, Other: <i>W - pH 4-5, Z - other (specify)</i>							
Sample Identification		Sample Date		Sample Time		Sample Type (C=Comp, G=grab)		Matrix (W=Water, S=Soil, O=Organic, B=Trace, A=Air)	
MMW-7		6/7/18		0900		G		Water	
MMW-8		6/7/18		1050		G		Water	
MMW-9		6/6/18		1730		G		Water	
MMW-10		6/5/18		1635		G		Water	
MMW-13		6/6/18		1030		G		Water	
Field Duplicate MW-10D		6/5/18		1645		G		Water	
Equipment Blank MW-10EB		6/5/18		1730		G		Water	
Possible Hazard Identification		Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological ☐							
Deliverable Requested: I, II, III, IV, Other (specify)									
Empty Kit Relinquished by:		Date: <i>6/7/18</i>		Time: <i>1400</i>		Company: <i>HDR</i>		Received by: <i>[Signature]</i>	
Relinquished by: <i>Nick Hanrahan</i>		Date/Time: <i>6/7/18 1400</i>		Company: <i>HDR</i>		Received by: <i>[Signature]</i>		Date/Time: <i>6-7-18 1400</i>	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact: ☒ Yes ☐ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <i>3.0, 4.0, 3.7 +0.0 KD 06-07-18</i>					

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)				Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:	
Client Contact: Shipping/Receiving Company: TestAmerica Laboratories, Inc.				Phone:		Rothmeyer, Stephanie K		280-441679.1		Page:	
				E-Mail:		stephanie.rothmeyer@testamericainc.com		State of Origin: Colorado		Page 1 of 1	
Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email:				Due Date Requested: 7/3/2018 TAT Requested (days):		Analysis Requested		Preservation Codes:		Job #:	
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station				PO #: WO #: Project #: 28014371 SSOW#:		Perform MS/MSD (Yes or No)		9316_Ra226/PrecSep_21 Radium-226 - /13 - SUB		9320_Ra228/PrecSep_0 Radium-228 - /23 - SUB	
Sample Identification - Client ID (Lab ID)				Sample Type (C=comp, G=grab)		Matrix (Water, Seawater, Other Tissue, A=Air)		Field Filtered Sample (Yes or No)		Ra226/Ra228_GFP/C (MOD) Local Method	
Sample Date				Sample Time		Preservation Code:		Total Number of Containers		Special Instructions/Note:	
MW-7 (280-110626-1)	6/7/18	09:00 Mountain	Water	X	X	X	X	2			
MW-8 (280-110626-2)	6/7/18	10:50 Mountain	Water	X	X	X	X	2			
MW-9 (280-110626-3)	6/6/18	17:30 Mountain	Water	X	X	X	X	2			
MW-10 (280-110626-4)	6/5/18	16:35 Mountain	Water	X	X	X	X	2			
MW-13 (280-110626-5)	6/6/18	10:30 Mountain	Water	X	X	X	X	2			
MW-10D (280-110626-6)	6/5/18	16:45 Mountain	Water	X	X	X	X	2			
MW-10EB (280-110626-7)	6/5/18	17:30 Mountain	Water	X	X	X	X	2			
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method analysis results on the client. The client is responsible for ensuring that all samples are analyzed by a laboratory currently maintaining accreditation in the State of Origin listed above for analysis. If all requested accreditations are current to date, retain the signed Chain of Custody showing the signed Company Seal and Laboratory Seal.											
Possible Hazard Identification											
Unconfirmed											
Deliverable Requested: I, II, III, IV, Other (specify)											
Primary Deliverable Mark: 4											
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)											
Return To Client ☐ Disposal By Lab ☐											
Relinquished by: [Signature] Date/time: 6/8/18 1551 Company: TATSL company											
Relinquished by: [Signature] Date/time: 6-9-18 0938 Company: TATSL company											
Relinquished by: [Signature] Date/time: [Blank] Company: [Blank]											
Custody Seals Intact: Yes A No											

Chain of Custody Record



Client Information (Sub Contract Lab)		Sampler:	Lab PM:	Carrier Tracking No(s):	COC No:				
Shipping/Receiving		Phone:	Rothmeyer, Stephanie K		280-441680.1				
Company:		E-Mail:	stephanie.rothmeyer@testamericainc.com	State of Origin:	Page: Page 1 of 1				
TestAmerica Laboratories, Inc.		Accreditations Required (See note):	NELAP - Oregon	Job #:	280-110626-1				
Address:		Due Date Requested:	Analysis Requested						
4101 Shuffel Street NW,		6/29/2018							
City:		TAT Requested (days):							
North Canton									
State, Zip:									
OH, 44720									
Phone:		PO #:							
330-497-9396(Tel) 330-497-0772(Fax)									
Email:		WO #:							
Project Name:		Project #:							
Xcel Energy GW CCR Monitoring - Cherokee		28014371							
Site:		SSOW#:							
Xcel Energy CCR - Cherokee Station									
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=Water, S=solid, O=Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 13 Metals	Total Number of Containers	Special Instructions/Note:
MW-8 (280-110626-2)	6/7/18	10:50 Mountain		Water			X	2	Use Collision Cell
MW-9 (280-110626-3)	6/6/18	17:30 Mountain		Water			X	2	Use Collision Cell
MW-10 (280-110626-4)	6/5/18	16:35 Mountain		Water			X	2	Use Collision Cell
MW-13 (280-110626-5)	6/6/18	10:30 Mountain		Water			X	2	Use Collision Cell
MW-10D (280-110626-6)	6/5/18	16:45 Mountain		Water			X	2	Use Collision Cell
MW-10EB (280-110626-7)	6/5/18	17:30 Mountain		Water			X	2	Use Collision Cell
Note: Since laboratory accreditation is subject to change, TestAmerica Laboratories, Inc. (TAL) is required to maintain accreditation in the current year. TAL is currently maintaining accreditation in the current year. TAL is currently maintaining accreditation in the current year. TAL is currently maintaining accreditation in the current year. Possible Hazard Identification Unconfirmed Calibration Requested: Relinquished by: <i>[Signature]</i> Relinquished by: Relinquished by: Relinquished by: Custody Seals Intact: ☐ Yes ☐ No Custody Seal No.:									

6-9-18 950 TAC

POP

6/8/18 1546

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

4, 6/64, 6

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)				Sampler:	Lab PM:	Carrier Tracking No(s)	COC No:
Client Contact:				Phone:	E-Mail:	State of Origin:	280-441692.1
Shipping/Receiving					stephanie.rothmeyer@testamericainc.com	Colorado	Page 1 of 1
Company:				Accreditations Required (See note):			
TestAmerica Laboratories, Inc.				NELAP - Oregon			
Address:				Due Date Requested:			
4101 Shuffel Street NW,				6/29/2018			
City:				TAT Requested (days):			
North Canton							
State, Zip:				PO #			
OH, 44720				WO #			
Phone:				Project #			
330-497-9396(Tel) 330-497-0772(Fax)				28014371			
Email:				SSOW#			
Project Name:				Sample Date			
Xcel Energy GW CCR Monitoring - Cherokee				6/7/18			
Site:				Sample Time			
Xcel Energy CCR - Cherokee Station				09:00 Mountain			
Sample Identification - Client ID (Lab ID)				Sample Type (C=comp, G=grab)			
MWL-7 (280-110626-1)				Matrix (Water, Soil, Other)			
				Preservation Code			
				Water			
				Field Filtered Sample (Yes or No)			
				Perform MS/MSD (Yes or No)			
				6020A/3005A (MOD) 12 Total Metals (w/collision cell)			
				Total Number of containers			
				1			
				Use Collision Cell			
				Special Instructions/Note:			
				S7			
				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			
				Other:			
				M - Hexane			
				N - None			
				O - AsNaO2			
				P - Na2O4S			
				Q - Na2SO3			
				R - Na2SO3			
				S - H2SO4			
				T - TSP Codehydrate			
				U - Acetone			
				V - MCAA			
				W - pH 4-5			
				Z - other (specify)			

Possible Hazard Identification

Unconfirmed

Deliverable Requested ()

6/8/18 1546

GP

6-9-18 950 1A-C

Custody Seals Intact: A Yes A No

Custody Seal Intact: A Yes A No

Client <u>TA DENVER</u>		Site Name <u> </u>		Cooler unpacked by: <u>BDP</u>	
Cooler Received on <u>6-9-18</u>		Opened on <u>6-9-18</u>			
FedEx: 1 st Grd <u>Exp</u> UPS FAS Clipper Client Drop Off TestAmerica Courier Other <u> </u>					
Receipt After-hours: Drop-off Date/Time <u> </u>				Storage Location <u> </u>	
TestAmerica Cooler # <u>TA</u>		Foam Box	Client Cooler	Box	Other <u> </u>
Packing material used: <u>Bubble Wrap</u>		Foam	<u>Plastic Bag</u>	None	Other <u> </u>
COOLANT: <u>Wet Ice</u>		Blue Ice	Dry Ice	Water	None
1. Cooler temperature upon receipt		☐ See Multiple Cooler Form			
IR GUN# IR-8 (CF +0 °C) Observed Cooler Temp. <u>4.6</u> °C		Corrected Cooler Temp. <u>4.6</u> °C			
IR GUN #36 (CF -0.3°C) Observed Cooler Temp. <u> </u> °C		Corrected Cooler Temp. <u> </u> °C			
IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. <u> </u> °C		Corrected Cooler Temp. <u> </u> °C			
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u>		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 ☐ NA ☐			
-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# <u>HC740840</u>	
13. Were VOAs on the COC?		Yes ☒ No ☐ NA ☐			
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 # <u> </u>		Yes ☒ No ☐			
16. Was a LL Hg or Me Hg trip blank present? <u> </u>		Yes ☒ No ☐			
Contacted PM <u> </u> Date <u> </u> by <u> </u> via Verbal Voice Mail Other <u> </u>					
Concerning <u> </u>					

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES		Samples processed by: <u> </u>
18. SAMPLE CONDITION		
Sample(s) <u> </u> were received after the recommended holding time had expired.		
Sample(s) <u> </u> were received in a broken container.		
Sample(s) <u> </u> were received with bubble >6 mm in diameter. (Notify PM)		
19. SAMPLE PRESERVATION		
Sample(s) <u> </u> were further preserved in the laboratory.		
Time preserved: <u> </u> Preservative(s) added/Lot number(s): <u> </u>		

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-110626-1

Login Number: 110626

List Source: TestAmerica Denver

List Number: 1

Creator: Dunlap, Krista M

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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.	False	Refer to Job Narrative for details.
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-110626-1

Login Number: 110626

List Number: 3

Creator: Press, Nicholas B

List Source: TestAmerica St. Louis

List Creation: 06/09/18 01:13 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18
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 $<6\text{mm}$ (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

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

TestAmerica Job ID: 280-110626-1

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)	
280-110626-1	MW-7	79.6	
280-110626-2	MW-8	90.6	
280-110626-3	MW-9	88.5	
280-110626-4	MW-10	95.0	
280-110626-5	MW-13	92.3	
280-110626-6	MW-10D	97.9	
280-110626-7	MW-10EB	95.6	
LCS 160-369971/1-A	Lab Control Sample	92.3	
LCSD 160-369971/2-A	Lab Control Sample Dup	90.3	
MB 160-369971/23-A	Method Blank	87.0	

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)
280-110626-1	MW-7	79.6	81.1
280-110626-2	MW-8	90.6	91.6
280-110626-3	MW-9	88.5	89.0
280-110626-4	MW-10	95.0	90.5
280-110626-5	MW-13	92.3	87.1
280-110626-6	MW-10D	97.9	85.2
280-110626-7	MW-10EB	95.6	84.1
LCS 160-369991/1-A	Lab Control Sample	92.3	88.2
LCSD 160-369991/2-A	Lab Control Sample Dup	90.3	88.6
MB 160-369991/23-A	Method Blank	87.0	89.0

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: 280-110626-2

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:

7/19/2018 4:43:40 PM

Stephanie Rothmeyer, Project Manager I

(303)736-0182

stephanie.rothmeyer@testamericainc.com

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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.

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Definitions/Glossary

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

TestAmerica Job ID: 280-110626-2

Qualifiers

Metals

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-110626-2

Job ID: 280-110626-2

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-110626-2

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 6/7/2018 at 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 3.0° C, 3.7° C and 4.0° C.

TOTAL MERCURY

Samples MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6) and MW-10EB (280-110626-7) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 07/17/2018 and analyzed on 07/18/2018.

The following analysis was requested outside of analytical holding time: MW-7 (280-110626-1), MW-8 (280-110626-2), MW-9 (280-110626-3), MW-10 (280-110626-4), MW-13 (280-110626-5), MW-10D (280-110626-6), MW-10EB (280-110626-7).

No additional 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

TestAmerica Job ID: 280-110626-2

Client Sample ID: MW-7

Lab Sample ID: 280-110626-1

☐ No Detections.

Client Sample ID: MW-8

Lab Sample ID: 280-110626-2

☐ No Detections.

Client Sample ID: MW-9

Lab Sample ID: 280-110626-3

☐ No Detections.

Client Sample ID: MW-10

Lab Sample ID: 280-110626-4

☐ No Detections.

Client Sample ID: MW-13

Lab Sample ID: 280-110626-5

☐ No Detections.

Client Sample ID: MW-10D

Lab Sample ID: 280-110626-6

☐ No Detections.

Client Sample ID: MW-10EB

Lab Sample ID: 280-110626-7

☐ No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

Client: HDR Inc

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-110626-2

Method	Method Description	Protocol	Laboratory
7470A	Mercury (CVAA)	SW846	TAL CAN
7470A	Preparation, Mercury	SW846	TAL CAN

Protocol References:

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

Laboratory References:

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

Sample Summary

Client: HDR Inc

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-110626-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-110626-1	MW-7	Water	06/07/18 09:00	06/07/18 14:00
280-110626-2	MW-8	Water	06/07/18 10:50	06/07/18 14:00
280-110626-3	MW-9	Water	06/06/18 17:30	06/07/18 14:00
280-110626-4	MW-10	Water	06/05/18 16:35	06/07/18 14:00
280-110626-5	MW-13	Water	06/06/18 10:30	06/07/18 14:00
280-110626-6	MW-10D	Water	06/05/18 16:45	06/07/18 14:00
280-110626-7	MW-10EB	Water	06/05/18 17:30	06/07/18 14:00

Client Sample Results

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

TestAmerica Job ID: 280-110626-2

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-7
Date Collected: 06/07/18 09:00
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 17:58	1

Client Sample ID: MW-8
Date Collected: 06/07/18 10:50
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:00	1

Client Sample ID: MW-9
Date Collected: 06/06/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:02	1

Client Sample ID: MW-10
Date Collected: 06/05/18 16:35
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:04	1

Client Sample ID: MW-13
Date Collected: 06/06/18 10:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:06	1

Client Sample ID: MW-10D
Date Collected: 06/05/18 16:45
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:08	1

Client Sample ID: MW-10EB
Date Collected: 06/05/18 17:30
Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND	H	0.20	0.13	ug/L	—	07/17/18 14:00	07/18/18 18:10	1

QC Sample Results

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

TestAmerica Job ID: 280-110626-2

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-336604/1-A

Matrix: Water

Analysis Batch: 336998

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 336604

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		07/17/18 14:00	07/18/18 17:23	1

Lab Sample ID: LCS 240-336604/2-A

Matrix: Water

Analysis Batch: 336998

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 336604

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.70		ug/L		94	80 - 120

QC Association Summary

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

TestAmerica Job ID: 280-110626-2

Metals

Prep Batch: 336604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	7470A	
280-110626-2	MW-8	Total/NA	Water	7470A	
280-110626-3	MW-9	Total/NA	Water	7470A	
280-110626-4	MW-10	Total/NA	Water	7470A	
280-110626-5	MW-13	Total/NA	Water	7470A	
280-110626-6	MW-10D	Total/NA	Water	7470A	
280-110626-7	MW-10EB	Total/NA	Water	7470A	
MB 240-336604/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-336604/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 336998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-110626-1	MW-7	Total/NA	Water	7470A	336604
280-110626-2	MW-8	Total/NA	Water	7470A	336604
280-110626-3	MW-9	Total/NA	Water	7470A	336604
280-110626-4	MW-10	Total/NA	Water	7470A	336604
280-110626-5	MW-13	Total/NA	Water	7470A	336604
280-110626-6	MW-10D	Total/NA	Water	7470A	336604
280-110626-7	MW-10EB	Total/NA	Water	7470A	336604
MB 240-336604/1-A	Method Blank	Total/NA	Water	7470A	336604
LCS 240-336604/2-A	Lab Control Sample	Total/NA	Water	7470A	336604

Lab Chronicle

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

TestAmerica Job ID: 280-110626-2

Client Sample ID: MW-7

Date Collected: 06/07/18 09:00

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 17:58	AJC	TAL CAN

Client Sample ID: MW-8

Date Collected: 06/07/18 10:50

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:00	AJC	TAL CAN

Client Sample ID: MW-9

Date Collected: 06/06/18 17:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:02	AJC	TAL CAN

Client Sample ID: MW-10

Date Collected: 06/05/18 16:35

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:04	AJC	TAL CAN

Client Sample ID: MW-13

Date Collected: 06/06/18 10:30

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:06	AJC	TAL CAN

Client Sample ID: MW-10D

Date Collected: 06/05/18 16:45

Date Received: 06/07/18 14:00

Lab Sample ID: 280-110626-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:08	AJC	TAL CAN

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-110626-2

Client Sample ID: MW-10EB

Lab Sample ID: 280-110626-7

Date Collected: 06/05/18 17:30

Matrix: Water

Date Received: 06/07/18 14:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	7470A			50 mL	50 mL	336604	07/17/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			336998	07/18/18 18:10	AJC	TAL CAN

Laboratory References:

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

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-110626-2

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	01-08-19

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	07-31-18 *
Kansas	NELAP	7	E-10336	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18 *
Nevada	State Program	9	OH-000482008A	07-31-18 *
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	08-31-18 *
Texas	NELAP	6	T104704517-17-9	08-31-18 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18 *
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

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

TestAmerica Denver

TestAmerica

Alvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

TestAmerica

7/19/2018

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-110626-2

Login Number: 110626

List Number: 1

Creator: Dunlap, Krista M

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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.	False	Refer to Job Narrative for details.
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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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: 280-113767-1

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:

10/1/2018 1:32:14 PM

Darlene Bandy, Project Manager I

(303)736-0188

darlene.bandy@testamericainc.com

LINKS

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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.

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Definitions/Glossary

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

TestAmerica Job ID: 280-113767-1

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.
B	Compound was found in the blank and sample.

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.
H	Sample was prepped or analyzed beyond the specified holding time

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.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-113767-1

Job ID: 280-113767-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-113767-1

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 8/29/2018 3:10 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.1° C and 1.5° C.

TOTAL RECOVERABLE METALS

Samples MW-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/04/2018 and analyzed on 09/11/2018.

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 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/04/2018 and analyzed on 09/20/2018.

Chromium was detected in method blank MB 240-343748/1-A at a level exceeding the reporting limit. This compound is considered a common laboratory contaminant. The associated samples were not re-extracted and/or re-analyzed because the concentration of the common lab contaminant in the method blank was less than 2 times the RL, and the SOP allows Chromium up to 2x the RL in the method blank. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

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-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 09/04/2018 and analyzed on 09/05/2018.

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

Case Narrative

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

TestAmerica Job ID: 280-113767-1

Job ID: 280-113767-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

TOTAL DISSOLVED SOLIDS

Samples MW-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/05/2018 and 09/12/2018.

Reanalysis of the following sample was performed outside of the analytical holding time: MW15EB (280-113767-4). The sample was initially analyzed within hold, but at half the required volume; the sample was non-detect. The sample was reanalyzed on 9/12/2018, out of hold but still within 2x hold, at the required volume; sample had a detection greater than the reporting limit.

Total Dissolved Solids (TDS) was detected in method blank MB 280-428633/1 at a level greater than half the reporting limit. The associated samples are >10 times the method blank result. 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 280-429440/1 at a level equal to half the reporting limit. 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 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 08/30/2018.

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

CORROSIVITY (PH)

Samples MW-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 09/06/2018, 09/07/2018 and 09/12/2018.

The following sample did not converge to constant pH within an interval of 0.05: MW15EB (280-113767-4). This is consistent with the results observed in batch 428861.

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 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/18/2018.

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.

Samples MW-14 (280-113767-1)[5X], MW-15 (280-113767-2)[5X], MW-15D (280-113767-3)[10X], MW-16 (280-113767-5)[10X], MW-17 (280-113767-6)[10X] and MW-17 (280-113767-6)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 09/04/2018 and 09/05/2018 and analyzed on 09/26/2018 and 09/27/2018.

Case Narrative

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

TestAmerica Job ID: 280-113767-1

Job ID: 280-113767-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Sample aliquot for MW-14 (280-113767-1) was reduced due to potential matrix interference. Sample was murky and contained sediment.

Radium-226 was detected in method blank MB 160-386896/23-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. Radium-226 was detected in method blank MB 160-387165/23-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.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision. Radium 226 Prep Batch 160-386896.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-14 (280-113767-1), MW-15 (280-113767-2) and MW-15D (280-113767-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision. Radium 226 Prep Batch 160-387165.

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

RADIUM-228

Samples MW-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 09/04/2018 and 09/05/2018 and analyzed on 09/11/2018 and 09/13/2018.

Sample aliquot for MW-14 (280-113767-1) was reduced due to potential matrix interference. Sample was murky and contained sediment.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision. Radium 228 Prep Batch 160-386899.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-14 (280-113767-1), MW-15 (280-113767-2) and MW-15D (280-113767-3). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision. Radium 228 Prep Batch 160-387170.

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-14 (280-113767-1), MW-15 (280-113767-2), MW-15D (280-113767-3), MW15EB (280-113767-4), MW-16 (280-113767-5) and MW-17 (280-113767-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 09/28/2018.

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-14

Lab Sample ID: 280-113767-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	1.8		0.10	0.023	mg/L	1			6010C	Total
Arsenic	0.00093	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.082		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Cadmium	0.00033	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Cobalt	0.0031		0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Chromium	0.016	B	0.0020	0.00098	mg/L	1			6020A	Recoverable Total
Molybdenum	0.072		0.010	0.0011	mg/L	1			6020A	Recoverable Total
Lead	0.00055	J	0.0010	0.00045	mg/L	1			6020A	Recoverable Total
Selenium	0.011		0.0050	0.00089	mg/L	1			6020A	Recoverable Total
Lithium	0.094		0.0080	0.0017	mg/L	1			6020A	Recoverable Total
Calcium	240		1.0	0.58	mg/L	1			6020A	Recoverable Total
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	20.8	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	340		15	1.3	mg/L	5			9056A	Total/NA
Fluoride	1.7		0.50	0.060	mg/L	1			9056A	Total/NA
Sulfate	470		25	1.2	mg/L	5			9056A	Total/NA
Total Dissolved Solids (TDS)	1600	B	20	9.4	mg/L	1			SM 2540C	Total/NA
Total Suspended Solids	75		4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-15

Lab Sample ID: 280-113767-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	2.1		0.10	0.023	mg/L	1			6010C	Total
Antimony	0.0015	J	0.0020	0.00057	mg/L	1			6020A	Recoverable Total
Arsenic	0.0026	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.10		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Cadmium	0.00071	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Cobalt	0.0028		0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Chromium	0.0030	B	0.0020	0.00098	mg/L	1			6020A	Recoverable Total
Molybdenum	0.046		0.010	0.0011	mg/L	1			6020A	Recoverable Total
Selenium	0.0032	J	0.0050	0.00089	mg/L	1			6020A	Recoverable Total
Lithium	0.10		0.0080	0.0017	mg/L	1			6020A	Recoverable Total
Calcium	240		1.0	0.58	mg/L	1			6020A	Recoverable Total
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU	1			9040B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-15 (Continued)

Lab Sample ID: 280-113767-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Temperature	21.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	320		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.9		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	910		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-15D

Lab Sample ID: 280-113767-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.1		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	0.0029	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.11		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00073	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.0030		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0047	B	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.046		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0033	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.10		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Calcium	240		1.0	0.58	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	20.7	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	300		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.9		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	860		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	2.8	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW15EB

Lab Sample ID: 280-113767-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cadmium	0.0019		0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Chromium	0.0026	B	0.0020	0.00098	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	19.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	0.31	J	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	1.0	J	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	11	H B	10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-16

Lab Sample ID: 280-113767-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	1.2		0.10	0.023	mg/L	1			6010C	Total
Antimony	0.00090	J	0.0020	0.00057	mg/L	1			6020A	Recoverable
Arsenic	0.0032	J	0.0050	0.00075	mg/L	1			6020A	Total
Barium	0.066		0.0050	0.0022	mg/L	1			6020A	Recoverable
Cadmium	0.00079	J	0.0010	0.00021	mg/L	1			6020A	Total
Cobalt	0.0019		0.0010	0.00019	mg/L	1			6020A	Recoverable
Chromium	0.0044	B	0.0020	0.00098	mg/L	1			6020A	Total
Molybdenum	0.037		0.010	0.0011	mg/L	1			6020A	Recoverable
Selenium	0.011		0.0050	0.00089	mg/L	1			6020A	Total
Lithium	0.10		0.0080	0.0017	mg/L	1			6020A	Recoverable
Calcium	280		1.0	0.58	mg/L	1			6020A	Total
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1			9040B	Recoverable
Temperature	20.5	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	450		30	2.5	mg/L	10			9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1			9056A	Total/NA
Sulfate	670		50	2.3	mg/L	10			9056A	Total/NA
Total Dissolved Solids (TDS)	2000	B	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-17

Lab Sample ID: 280-113767-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.77		0.10	0.023	mg/L	1			6010C	Total
Arsenic	0.0042	J	0.0050	0.00075	mg/L	1			6020A	Recoverable
Barium	0.079		0.0050	0.0022	mg/L	1			6020A	Total
Cadmium	0.0024		0.0010	0.00021	mg/L	1			6020A	Recoverable
Cobalt	0.0014		0.0010	0.00019	mg/L	1			6020A	Total
Chromium	0.0047	B	0.0020	0.00098	mg/L	1			6020A	Recoverable
Molybdenum	0.014		0.010	0.0011	mg/L	1			6020A	Total
Selenium	0.0061		0.0050	0.00089	mg/L	1			6020A	Recoverable
Lithium	0.11		0.0080	0.0017	mg/L	1			6020A	Total
Calcium	370		1.0	0.58	mg/L	1			6020A	Recoverable
pH adj. to 25 deg C	7.4	HF	0.1	0.1	SU	1			9040B	Total
Temperature	20.3	HF	1.0	1.0	Degrees C	1			9040B	NA
Chloride	540		15	1.3	mg/L	5			9056A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-17 (Continued)

Lab Sample ID: 280-113767-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	1.8		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1200		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2800	B	20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

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

TestAmerica Job ID: 280-113767-1

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: 280-113767-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-113767-1	MW-14	Water	08/29/18 09:35	08/29/18 15:10
280-113767-2	MW-15	Water	08/29/18 10:55	08/29/18 15:10
280-113767-3	MW-15D	Water	08/29/18 10:55	08/29/18 15:10
280-113767-4	MW15EB	Water	08/29/18 11:10	08/29/18 15:10
280-113767-5	MW-16	Water	08/29/18 12:40	08/29/18 15:10
280-113767-6	MW-17	Water	08/29/18 13:55	08/29/18 15:10

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.8		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:06	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:11	1

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:25	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:30	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.2		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:35	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.77		0.10	0.023	mg/L	-	09/04/18 14:00	09/11/18 00:40	1

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

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Arsenic	0.00093	J	0.0050	0.00075	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Barium	0.082		0.0050	0.0022	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Beryllium	ND		0.0010	0.00031	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Cadmium	0.00033	J	0.0010	0.00021	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Cobalt	0.0031		0.0010	0.00019	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Chromium	0.016	B	0.0020	0.00098	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Molybdenum	0.072		0.010	0.0011	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Lead	0.00055	J	0.0010	0.00045	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Selenium	0.011		0.0050	0.00089	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Thallium	ND		0.0010	0.00020	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Lithium	0.094		0.0080	0.0017	mg/L	-	09/04/18 14:00	09/20/18 01:53	1
Calcium	240		1.0	0.58	mg/L	-	09/04/18 14:00	09/20/18 01:53	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		09/04/18 14:00	09/20/18 01:58	1
Arsenic	0.0026	J	0.0050	0.00075	mg/L		09/04/18 14:00	09/20/18 01:58	1
Barium	0.10		0.0050	0.0022	mg/L		09/04/18 14:00	09/20/18 01:58	1
Beryllium	ND		0.0010	0.00031	mg/L		09/04/18 14:00	09/20/18 01:58	1
Cadmium	0.00071	J	0.0010	0.00021	mg/L		09/04/18 14:00	09/20/18 01:58	1
Cobalt	0.0028		0.0010	0.00019	mg/L		09/04/18 14:00	09/20/18 01:58	1
Chromium	0.0030	B	0.0020	0.00098	mg/L		09/04/18 14:00	09/20/18 01:58	1
Molybdenum	0.046		0.010	0.0011	mg/L		09/04/18 14:00	09/20/18 01:58	1
Lead	ND		0.0010	0.00045	mg/L		09/04/18 14:00	09/20/18 01:58	1
Selenium	0.0032	J	0.0050	0.00089	mg/L		09/04/18 14:00	09/20/18 01:58	1
Thallium	ND		0.0010	0.00020	mg/L		09/04/18 14:00	09/20/18 01:58	1
Lithium	0.10		0.0080	0.0017	mg/L		09/04/18 14:00	09/20/18 01:58	1
Calcium	240		1.0	0.58	mg/L		09/04/18 14:00	09/20/18 01:58	1

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		09/04/18 14:00	09/20/18 02:02	1
Arsenic	0.0029	J	0.0050	0.00075	mg/L		09/04/18 14:00	09/20/18 02:02	1
Barium	0.11		0.0050	0.0022	mg/L		09/04/18 14:00	09/20/18 02:02	1
Beryllium	ND		0.0010	0.00031	mg/L		09/04/18 14:00	09/20/18 02:02	1
Cadmium	0.00073	J	0.0010	0.00021	mg/L		09/04/18 14:00	09/20/18 02:02	1
Cobalt	0.0030		0.0010	0.00019	mg/L		09/04/18 14:00	09/20/18 02:02	1
Chromium	0.0047	B	0.0020	0.00098	mg/L		09/04/18 14:00	09/20/18 02:02	1
Molybdenum	0.046		0.010	0.0011	mg/L		09/04/18 14:00	09/20/18 02:02	1
Lead	ND		0.0010	0.00045	mg/L		09/04/18 14:00	09/20/18 02:02	1
Selenium	0.0033	J	0.0050	0.00089	mg/L		09/04/18 14:00	09/20/18 02:02	1
Thallium	ND		0.0010	0.00020	mg/L		09/04/18 14:00	09/20/18 02:02	1
Lithium	0.10		0.0080	0.0017	mg/L		09/04/18 14:00	09/20/18 02:02	1
Calcium	240		1.0	0.58	mg/L		09/04/18 14:00	09/20/18 02:02	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/04/18 14:00	09/20/18 02:07	1
Arsenic	ND		0.0050	0.00075	mg/L		09/04/18 14:00	09/20/18 02:07	1
Barium	ND		0.0050	0.0022	mg/L		09/04/18 14:00	09/20/18 02:07	1
Beryllium	ND		0.0010	0.00031	mg/L		09/04/18 14:00	09/20/18 02:07	1
Cadmium	0.0019		0.0010	0.00021	mg/L		09/04/18 14:00	09/20/18 02:07	1
Cobalt	ND		0.0010	0.00019	mg/L		09/04/18 14:00	09/20/18 02:07	1
Chromium	0.0026	B	0.0020	0.00098	mg/L		09/04/18 14:00	09/20/18 02:07	1
Molybdenum	ND		0.010	0.0011	mg/L		09/04/18 14:00	09/20/18 02:07	1
Lead	ND		0.0010	0.00045	mg/L		09/04/18 14:00	09/20/18 02:07	1
Selenium	ND		0.0050	0.00089	mg/L		09/04/18 14:00	09/20/18 02:07	1
Thallium	ND		0.0010	0.00020	mg/L		09/04/18 14:00	09/20/18 02:07	1
Lithium	ND		0.0080	0.0017	mg/L		09/04/18 14:00	09/20/18 02:07	1
Calcium	ND		1.0	0.58	mg/L		09/04/18 14:00	09/20/18 02:07	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00090	J	0.0020	0.00057	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Arsenic	0.0032	J	0.0050	0.00075	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Barium	0.066		0.0050	0.0022	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Beryllium	ND		0.0010	0.00031	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Cadmium	0.00079	J	0.0010	0.00021	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Cobalt	0.0019		0.0010	0.00019	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Chromium	0.0044	B	0.0020	0.00098	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Molybdenum	0.037		0.010	0.0011	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Lead	ND		0.0010	0.00045	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Selenium	0.011		0.0050	0.00089	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Thallium	ND		0.0010	0.00020	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Lithium	0.10		0.0080	0.0017	mg/L	—	09/04/18 14:00	09/20/18 02:12	1
Calcium	280		1.0	0.58	mg/L	—	09/04/18 14:00	09/20/18 02:12	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Arsenic	0.0042	J	0.0050	0.00075	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Barium	0.079		0.0050	0.0022	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Beryllium	ND		0.0010	0.00031	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Cadmium	0.0024		0.0010	0.00021	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Cobalt	0.0014		0.0010	0.00019	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Chromium	0.0047	B	0.0020	0.00098	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Molybdenum	0.014		0.010	0.0011	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Lead	ND		0.0010	0.00045	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Selenium	0.0061		0.0050	0.00089	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Thallium	ND		0.0010	0.00020	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Lithium	0.11		0.0080	0.0017	mg/L	—	09/04/18 14:00	09/20/18 02:16	1
Calcium	370		1.0	0.58	mg/L	—	09/04/18 14:00	09/20/18 02:16	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	—	09/04/18 14:00	09/05/18 12:40	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	—	09/04/18 14:00	09/05/18 12:42	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/04/18 14:00	09/05/18 12:44	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/04/18 14:00	09/05/18 12:46	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/04/18 14:00	09/05/18 12:48	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/04/18 14:00	09/05/18 12:50	1

General Chemistry

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
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			09/12/18 19:38	1
Temperature	20.8	HF	1.0	1.0	Degrees C			09/12/18 19:38	1
Chloride	340		15	1.3	mg/L			09/18/18 04:38	5
Fluoride	1.7		0.50	0.060	mg/L			09/18/18 04:15	1
Sulfate	470		25	1.2	mg/L			09/18/18 04:38	5
Total Dissolved Solids (TDS)	1600	B	20	9.4	mg/L			09/05/18 15:21	1
Total Suspended Solids	75		4.0	1.1	mg/L			08/30/18 17:51	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
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			09/06/18 21:14	1
Temperature	21.0	HF	1.0	1.0	Degrees C			09/06/18 21:14	1
Chloride	320		15	1.3	mg/L			09/18/18 05:22	5
Fluoride	1.9		0.50	0.060	mg/L			09/18/18 05:00	1
Sulfate	910		25	1.2	mg/L			09/18/18 05:22	5
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L			09/05/18 15:21	1
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			08/30/18 17:51	1

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
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			09/06/18 21:18	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

General Chemistry (Continued)

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	20.7	HF	1.0	1.0	Degrees C			09/06/18 21:18	1
Chloride	300		30	2.5	mg/L			09/18/18 20:13	10
Fluoride	1.9		0.50	0.060	mg/L			09/18/18 05:44	1
Sulfate	860		50	2.3	mg/L			09/18/18 20:13	10
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L			09/05/18 15:21	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			08/30/18 17:51	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

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			09/12/18 19:50	1
Temperature	19.8	HF	1.0	1.0	Degrees C			09/12/18 19:50	1
Chloride	0.31	J	3.0	0.25	mg/L			09/18/18 06:06	1
Fluoride	ND		0.50	0.060	mg/L			09/18/18 06:06	1
Sulfate	1.0	J	5.0	0.23	mg/L			09/18/18 06:06	1
Total Dissolved Solids (TDS)	11	H B	10	4.7	mg/L			09/12/18 16:41	1
Total Suspended Solids	ND		4.0	1.1	mg/L			08/30/18 17:51	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
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			09/06/18 21:30	1
Temperature	20.5	HF	1.0	1.0	Degrees C			09/06/18 21:30	1
Chloride	450		30	2.5	mg/L			09/18/18 07:13	10
Fluoride	2.0		0.50	0.060	mg/L			09/18/18 06:51	1
Sulfate	670		50	2.3	mg/L			09/18/18 07:13	10
Total Dissolved Solids (TDS)	2000	B	20	9.4	mg/L			09/05/18 15:21	1
Total Suspended Solids	12		4.0	1.1	mg/L			08/30/18 17:51	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
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			09/07/18 18:43	1
Temperature	20.3	HF	1.0	1.0	Degrees C			09/07/18 18:43	1
Chloride	540		15	1.3	mg/L			09/18/18 08:42	5
Fluoride	1.8		0.50	0.060	mg/L			09/18/18 07:35	1
Sulfate	1200		50	2.3	mg/L			09/18/18 21:42	10
Total Dissolved Solids (TDS)	2800	B	20	9.4	mg/L			09/05/18 15:21	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			08/30/18 17:51	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.625		0.176	0.185	1.00	0.145	pCi/L	09/05/18 08:39	09/27/18 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					09/05/18 08:39	09/27/18 15:56	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.473		0.132	0.138	1.00	0.110	pCi/L	09/05/18 08:39	09/27/18 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					09/05/18 08:39	09/27/18 15:56	1

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.585		0.138	0.148	1.00	0.0837	pCi/L	09/05/18 08:39	09/27/18 15:56	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					09/05/18 08:39	09/27/18 15:56	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.264		0.0866	0.0898	1.00	0.0734	pCi/L	09/04/18 10:50	09/26/18 10:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					09/04/18 10:50	09/26/18 10:02	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.544		0.120	0.129	1.00	0.0758	pCi/L	09/04/18 10:50	09/26/18 10:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					09/04/18 10:50	09/26/18 10:03	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.517		0.112	0.122	1.00	0.0671	pCi/L	09/04/18 10:50	09/26/18 10:03	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					09/04/18 10:50	09/26/18 10:03	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.314	U	0.322	0.324	1.00	0.524	pCi/L	09/05/18 09:08	09/13/18 09:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.4		40 - 110					09/05/18 09:08	09/13/18 09:30	1
Y Carrier	84.5		40 - 110					09/05/18 09:08	09/13/18 09:30	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.16		0.291	0.310	1.00	0.349	pCi/L	09/05/18 09:08	09/13/18 09:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					09/05/18 09:08	09/13/18 09:30	1
Y Carrier	88.2		40 - 110					09/05/18 09:08	09/13/18 09:30	1

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.793		0.291	0.300	1.00	0.398	pCi/L	09/05/18 09:08	09/13/18 09:30	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					09/05/18 09:08	09/13/18 09:30	1
Y Carrier	78.1		40 - 110					09/05/18 09:08	09/13/18 09:30	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.128	U	0.190	0.191	1.00	0.320	pCi/L	09/04/18 11:37	09/11/18 16:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					09/04/18 11:37	09/11/18 16:49	1
Y Carrier	88.2		40 - 110					09/04/18 11:37	09/11/18 16:49	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.534		0.239	0.244	1.00	0.339	pCi/L	09/04/18 11:37	09/11/18 16:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					09/04/18 11:37	09/11/18 16:49	1
Y Carrier	90.1		40 - 110					09/04/18 11:37	09/11/18 16:49	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.36		0.294	0.319	1.00	0.336	pCi/L	09/04/18 11:37	09/11/18 16:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	104		40 - 110					09/04/18 11:37	09/11/18 16:49	1
Y Carrier	91.2		40 - 110					09/04/18 11:37	09/11/18 16:49	1

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

Client Sample ID: MW-14
Date Collected: 08/29/18 09:35
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.939		0.367	0.373	5.00	0.524	pCi/L		09/28/18 10:58	1

Client Sample ID: MW-15
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.64		0.320	0.339	5.00	0.349	pCi/L		09/28/18 10:58	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Client Sample ID: MW-15D
Date Collected: 08/29/18 10:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.38		0.322	0.335	5.00	0.398	pCi/L		09/28/18 10:58	1

Client Sample ID: MW15EB
Date Collected: 08/29/18 11:10
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.392		0.209	0.211	5.00	0.320	pCi/L		09/28/18 10:58	1

Client Sample ID: MW-16
Date Collected: 08/29/18 12:40
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.08		0.267	0.276	5.00	0.339	pCi/L		09/28/18 10:58	1

Client Sample ID: MW-17
Date Collected: 08/29/18 13:55
Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.88		0.315	0.342	5.00	0.336	pCi/L		09/28/18 10:58	1

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-343748/1-A
Matrix: Water
Analysis Batch: 344627

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 343748

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		09/04/18 14:00	09/10/18 22:58	1

Lab Sample ID: LCS 240-343748/2-A
Matrix: Water
Analysis Batch: 344627

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 343748

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 240-343748/1-A
Matrix: Water
Analysis Batch: 346311

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 343748

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/04/18 14:00	09/19/18 23:58	1
Arsenic	ND		0.0050	0.00075	mg/L		09/04/18 14:00	09/19/18 23:58	1
Barium	ND		0.0050	0.0022	mg/L		09/04/18 14:00	09/19/18 23:58	1
Beryllium	ND		0.0010	0.00031	mg/L		09/04/18 14:00	09/19/18 23:58	1
Cadmium	ND		0.0010	0.00021	mg/L		09/04/18 14:00	09/19/18 23:58	1
Cobalt	ND		0.0010	0.00019	mg/L		09/04/18 14:00	09/19/18 23:58	1
Chromium	0.00201		0.0020	0.00098	mg/L		09/04/18 14:00	09/19/18 23:58	1
Molybdenum	ND		0.010	0.0011	mg/L		09/04/18 14:00	09/19/18 23:58	1
Lead	ND		0.0010	0.00045	mg/L		09/04/18 14:00	09/19/18 23:58	1
Selenium	ND		0.0050	0.00089	mg/L		09/04/18 14:00	09/19/18 23:58	1
Thallium	ND		0.0010	0.00020	mg/L		09/04/18 14:00	09/19/18 23:58	1
Lithium	ND		0.0080	0.0017	mg/L		09/04/18 14:00	09/19/18 23:58	1
Calcium	ND		1.0	0.58	mg/L		09/04/18 14:00	09/19/18 23:58	1

Lab Sample ID: LCS 240-343748/3-A
Matrix: Water
Analysis Batch: 346311

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 343748

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0983		mg/L		98	80 - 120
Arsenic	1.00	1.11		mg/L		111	80 - 120
Barium	1.00	0.990		mg/L		99	80 - 120
Beryllium	1.00	0.970		mg/L		97	80 - 120
Cadmium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	1.11		mg/L		111	80 - 120
Chromium	1.00	1.04		mg/L		104	80 - 120
Molybdenum	0.100	0.0970		mg/L		97	80 - 120
Lead	1.00	1.02		mg/L		102	80 - 120
Selenium	1.00	1.11		mg/L		111	80 - 120
Thallium	0.250	0.254		mg/L		102	80 - 120
Lithium	0.100	0.103		mg/L		103	80 - 120
Calcium	10.0	9.91		mg/L		99	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-343751/1-A

Matrix: Water

Analysis Batch: 343977

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 343751

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/04/18 14:00	09/05/18 12:01	1

Lab Sample ID: LCS 240-343751/2-A

Matrix: Water

Analysis Batch: 343977

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 343751

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.85		ug/L		97	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-428861/55

Matrix: Water

Analysis Batch: 428861

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

Lab Sample ID: LCS 280-429073/30

Matrix: Water

Analysis Batch: 429073

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: LCS 280-429537/4

Matrix: Water

Analysis Batch: 429537

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: 280-113767-1 DU

Matrix: Water

Analysis Batch: 429537

Client Sample ID: MW-14

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.5	HF	7.5		SU		0.1	5
Temperature	20.8	HF	20.5		Degrees C		2	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-429855/6

Matrix: Water

Analysis Batch: 429855

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	0.25	mg/L			09/17/18 12:13	1
Fluoride	ND		0.50	0.060	mg/L			09/17/18 12:13	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: MB 280-429855/6

Matrix: Water

Analysis Batch: 429855

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.0	0.23	mg/L			09/17/18 12:13	1

Lab Sample ID: LCS 280-429855/4

Matrix: Water

Analysis Batch: 429855

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Fluoride	5.00	5.04		mg/L		101	90 - 110
Sulfate	100	99.7		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-429855/5

Matrix: Water

Analysis Batch: 429855

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	100		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.05		mg/L		101	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-429855/3

Matrix: Water

Analysis Batch: 429855

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.54	J	mg/L		101	50 - 150
Fluoride	0.200	0.121	J	mg/L		61	50 - 150
Sulfate	2.50	2.58	J	mg/L		103	50 - 150

Lab Sample ID: MB 280-430024/6

Matrix: Water

Analysis Batch: 430024

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	0.25	mg/L			09/18/18 11:48	1
Fluoride	ND		0.50	0.060	mg/L			09/18/18 11:48	1
Sulfate	ND		5.0	0.23	mg/L			09/18/18 11:48	1

Lab Sample ID: LCS 280-430024/4

Matrix: Water

Analysis Batch: 430024

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	97.9		mg/L		98	90 - 110
Fluoride	5.00	5.21		mg/L		104	90 - 110
Sulfate	100	96.1		mg/L		96	90 - 110

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: LCSD 280-430024/5

Matrix: Water

Analysis Batch: 430024

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	97.8		mg/L		98	90 - 110	0	10
Fluoride	5.00	5.20		mg/L		104	90 - 110	0	10
Sulfate	100	96.1		mg/L		96	90 - 110	0	10

Lab Sample ID: MRL 280-430024/3

Matrix: Water

Analysis Batch: 430024

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	2.50	2.42	J	mg/L		97	50 - 150		
Fluoride	0.200	0.196	J	mg/L		98	50 - 150		
Sulfate	2.50	2.24	J	mg/L		89	50 - 150		

Lab Sample ID: 280-113767-3 MS

Matrix: Water

Analysis Batch: 430024

Client Sample ID: MW-15D

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	300		250	558		mg/L		103	80 - 120		
Fluoride	1.8	J	50.0	53.1		mg/L		103	80 - 120		
Sulfate	860		250	1090		mg/L		92	80 - 120		

Lab Sample ID: 280-113767-3 MSD

Matrix: Water

Analysis Batch: 430024

Client Sample ID: MW-15D

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	300		250	558		mg/L		103	80 - 120	0	20
Fluoride	1.8	J	50.0	53.0		mg/L		103	80 - 120	0	20
Sulfate	860		250	1090		mg/L		92	80 - 120	0	20

Lab Sample ID: 280-113767-3 DU

Matrix: Water

Analysis Batch: 430024

Client Sample ID: MW-15D

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	300		295		mg/L		2	15
Fluoride	1.8	J	1.73	J	mg/L		2	15
Sulfate	860		839		mg/L		2	15

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

Lab Sample ID: MB 280-428633/1

Matrix: Water

Analysis Batch: 428633

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)	9.00	J	10	4.7	mg/L			09/05/18 15:21	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: LCS 280-428633/2
Matrix: Water
Analysis Batch: 428633

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	483		mg/L		96	86 - 110

Lab Sample ID: MB 280-429440/1
Matrix: Water
Analysis Batch: 429440

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)	5.00	J	10	4.7	mg/L			09/12/18 16:41	1

Lab Sample ID: LCS 280-429440/2
Matrix: Water
Analysis Batch: 429440

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	497		mg/L		99	86 - 110

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

Lab Sample ID: MB 280-428183/1
Matrix: Water
Analysis Batch: 428183

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			08/30/18 17:51	1

Lab Sample ID: LCS 280-428183/2
Matrix: Water
Analysis Batch: 428183

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	90.8		mg/L		91	86 - 114

Lab Sample ID: 280-113767-6 DU
Matrix: Water
Analysis Batch: 428183

Client Sample ID: MW-17
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	4.8		4.80		mg/L		0	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-386896/23-A
Matrix: Water
Analysis Batch: 391268

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386896

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2475		0.0882	0.0909	1.00	0.0867	pCi/L	09/04/18 10:50	09/26/18 10:03	1

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QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: MB 160-386896/23-A
Matrix: Water
Analysis Batch: 391268

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386896

Carrier	MB %Yield	MB Qualifier	Limits
Ba Carrier	88.2		40 - 110

Prepared	Analyzed	Dil Fac
09/04/18 10:50	09/26/18 10:03	1

Lab Sample ID: LCS 160-386896/1-A
Matrix: Water
Analysis Batch: 391266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386896

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.86		1.11	1.00	0.0657	pCi/L	96	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	102		40 - 110						

Lab Sample ID: LCSD 160-386896/2-A
Matrix: Water
Analysis Batch: 391266

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 386896

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	11.27		1.14	1.00	0.0678	pCi/L	99	68 - 137	0.18	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	100		40 - 110								

Lab Sample ID: MB 160-387165/23-A
Matrix: Water
Analysis Batch: 391559

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 387165

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.5926		0.223	0.229	1.00	0.221	pCi/L	09/05/18 08:39	09/27/18 15:56	1
Carrier	MB %Yield	MB Qualifier	Limits							
Ba Carrier	97.9		40 - 110							

Prepared	Analyzed	Dil Fac
09/05/18 08:39	09/27/18 15:56	1

Lab Sample ID: LCS 160-387165/1-A
Matrix: Water
Analysis Batch: 391557

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 387165

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	22.7	30.07		3.06	1.00	0.205	pCi/L	132	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	108		40 - 110						

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QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: LCSD 160-387165/2-A
Matrix: Water
Analysis Batch: 391558

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 387165

					Total								
			Spike	LCSD	LCSD	Uncert.					%Rec.		RER
Analyte			Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	RER	Limit
Radium-226			22.7	27.18		2.75	1.00	0.218	pCi/L	120	68 - 137	0.50	1
Carrier	LCSD	LCSD											
	%Yield	Qualifier	Limits										
Ba Carrier	107		40 - 110										

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-386899/23-A
Matrix: Water
Analysis Batch: 388373

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 386899

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.08838	U	0.186	0.186	1.00	0.358	pCi/L	09/04/18 11:37	09/11/18 16:50	1
Carrier	MB %Yield	MB Qualifier	Limits							
Ba Carrier	88.2		40 - 110							
Y Carrier	90.5		40 - 110							

Lab Sample ID: LCS 160-386899/1-A
Matrix: Water
Analysis Batch: 388368

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 386899

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec Limits		
Radium-228		11.0	12.64		1.38	1.00	0.351	pCi/L	115	56 - 140	
Carrier	LCS %Yield	LCS Qualifier	Limits								
Ba Carrier	102		40 - 110								
Y Carrier	85.6		40 - 110								

Lab Sample ID: LCSD 160-386899/2-A
Matrix: Water
Analysis Batch: 388368

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 386899

					Total								
Analyte			Spike Added	LCSD Result	LCSD Qual	Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			11.0	12.13		1.33	1.00	0.336	pCi/L	110	56 - 140	0.19	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits										
Ba Carrier	100		40 - 110										
Y Carrier	88.2		40 - 110										

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-113767-1

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

Lab Sample ID: MB 160-387170/23-A

Matrix: Water

Analysis Batch: 388838

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 387170

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.4821	U	0.514	0.516	1.00	0.840	pCi/L	09/05/18 09:08	09/13/18 09:30	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.9		40 - 110	09/05/18 09:08	09/13/18 09:30	1
Y Carrier	78.9		40 - 110	09/05/18 09:08	09/13/18 09:30	1

Lab Sample ID: LCS 160-387170/1-A

Matrix: Water

Analysis Batch: 388835

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 387170

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	22.0	22.32		2.47	1.00	0.701	pCi/L	101	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	108		40 - 110
Y Carrier	85.2		40 - 110

Lab Sample ID: LCSD 160-387170/2-A

Matrix: Water

Analysis Batch: 388835

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 387170

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	22.0	25.26		2.76	1.00	0.698	pCi/L	115	56 - 140	0.56	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	107		40 - 110
Y Carrier	82.6		40 - 110

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-113767-1

Metals

Prep Batch: 343748

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total Recoverable	Water	3005A	
280-113767-2	MW-15	Total Recoverable	Water	3005A	
280-113767-3	MW-15D	Total Recoverable	Water	3005A	
280-113767-4	MW15EB	Total Recoverable	Water	3005A	
280-113767-5	MW-16	Total Recoverable	Water	3005A	
280-113767-6	MW-17	Total Recoverable	Water	3005A	
MB 240-343748/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-343748/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-343748/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 343751

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	7470A	
280-113767-2	MW-15	Total/NA	Water	7470A	
280-113767-3	MW-15D	Total/NA	Water	7470A	
280-113767-4	MW15EB	Total/NA	Water	7470A	
280-113767-5	MW-16	Total/NA	Water	7470A	
280-113767-6	MW-17	Total/NA	Water	7470A	
MB 240-343751/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-343751/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 343977

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	7470A	343751
280-113767-2	MW-15	Total/NA	Water	7470A	343751
280-113767-3	MW-15D	Total/NA	Water	7470A	343751
280-113767-4	MW15EB	Total/NA	Water	7470A	343751
280-113767-5	MW-16	Total/NA	Water	7470A	343751
280-113767-6	MW-17	Total/NA	Water	7470A	343751
MB 240-343751/1-A	Method Blank	Total/NA	Water	7470A	343751
LCS 240-343751/2-A	Lab Control Sample	Total/NA	Water	7470A	343751

Analysis Batch: 344627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total Recoverable	Water	6010C	343748
280-113767-2	MW-15	Total Recoverable	Water	6010C	343748
280-113767-3	MW-15D	Total Recoverable	Water	6010C	343748
280-113767-4	MW15EB	Total Recoverable	Water	6010C	343748
280-113767-5	MW-16	Total Recoverable	Water	6010C	343748
280-113767-6	MW-17	Total Recoverable	Water	6010C	343748
MB 240-343748/1-A	Method Blank	Total Recoverable	Water	6010C	343748
LCS 240-343748/2-A	Lab Control Sample	Total Recoverable	Water	6010C	343748

Analysis Batch: 346311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total Recoverable	Water	6020A	343748
280-113767-2	MW-15	Total Recoverable	Water	6020A	343748
280-113767-3	MW-15D	Total Recoverable	Water	6020A	343748
280-113767-4	MW15EB	Total Recoverable	Water	6020A	343748
280-113767-5	MW-16	Total Recoverable	Water	6020A	343748
280-113767-6	MW-17	Total Recoverable	Water	6020A	343748

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-113767-1

Metals (Continued)

Analysis Batch: 346311 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-343748/1-A	Method Blank	Total Recoverable	Water	6020A	343748
LCS 240-343748/3-A	Lab Control Sample	Total Recoverable	Water	6020A	343748

General Chemistry

Analysis Batch: 428183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	SM 2540D	
280-113767-2	MW-15	Total/NA	Water	SM 2540D	
280-113767-3	MW-15D	Total/NA	Water	SM 2540D	
280-113767-4	MW15EB	Total/NA	Water	SM 2540D	
280-113767-5	MW-16	Total/NA	Water	SM 2540D	
280-113767-6	MW-17	Total/NA	Water	SM 2540D	
MB 280-428183/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-428183/2	Lab Control Sample	Total/NA	Water	SM 2540D	
280-113767-6 DU	MW-17	Total/NA	Water	SM 2540D	

Analysis Batch: 428633

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	SM 2540C	
280-113767-2	MW-15	Total/NA	Water	SM 2540C	
280-113767-3	MW-15D	Total/NA	Water	SM 2540C	
280-113767-5	MW-16	Total/NA	Water	SM 2540C	
280-113767-6	MW-17	Total/NA	Water	SM 2540C	
MB 280-428633/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-428633/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 428861

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-2	MW-15	Total/NA	Water	9040B	
280-113767-3	MW-15D	Total/NA	Water	9040B	
280-113767-5	MW-16	Total/NA	Water	9040B	
LCS 280-428861/55	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 429073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-6	MW-17	Total/NA	Water	9040B	
LCS 280-429073/30	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 429440

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-4	MW15EB	Total/NA	Water	SM 2540C	
MB 280-429440/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-429440/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 429537

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	9040B	
280-113767-4	MW15EB	Total/NA	Water	9040B	
LCS 280-429537/4	Lab Control Sample	Total/NA	Water	9040B	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-113767-1

General Chemistry (Continued)

Analysis Batch: 429537 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1 DU	MW-14	Total/NA	Water	9040B	

Analysis Batch: 429855

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	9056A	
280-113767-1	MW-14	Total/NA	Water	9056A	
280-113767-2	MW-15	Total/NA	Water	9056A	
280-113767-2	MW-15	Total/NA	Water	9056A	
280-113767-3	MW-15D	Total/NA	Water	9056A	
280-113767-4	MW15EB	Total/NA	Water	9056A	
280-113767-5	MW-16	Total/NA	Water	9056A	
280-113767-5	MW-16	Total/NA	Water	9056A	
280-113767-6	MW-17	Total/NA	Water	9056A	
280-113767-6	MW-17	Total/NA	Water	9056A	
MB 280-429855/6	Method Blank	Total/NA	Water	9056A	
LCS 280-429855/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-429855/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-429855/3	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 430024

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-3	MW-15D	Total/NA	Water	9056A	
280-113767-6	MW-17	Total/NA	Water	9056A	
MB 280-430024/6	Method Blank	Total/NA	Water	9056A	
LCS 280-430024/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-430024/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-430024/3	Lab Control Sample	Total/NA	Water	9056A	
280-113767-3 MS	MW-15D	Total/NA	Water	9056A	
280-113767-3 MSD	MW-15D	Total/NA	Water	9056A	
280-113767-3 DU	MW-15D	Total/NA	Water	9056A	

Rad

Prep Batch: 386896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-4	MW15EB	Total/NA	Water	PrecSep-21	
280-113767-5	MW-16	Total/NA	Water	PrecSep-21	
280-113767-6	MW-17	Total/NA	Water	PrecSep-21	
MB 160-386896/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-386896/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-386896/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 386899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-4	MW15EB	Total/NA	Water	PrecSep_0	
280-113767-5	MW-16	Total/NA	Water	PrecSep_0	
280-113767-6	MW-17	Total/NA	Water	PrecSep_0	
MB 160-386899/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-386899/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-386899/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-113767-1

Rad (Continued)

Prep Batch: 387165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	PrecSep-21	
280-113767-2	MW-15	Total/NA	Water	PrecSep-21	
280-113767-3	MW-15D	Total/NA	Water	PrecSep-21	
MB 160-387165/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-387165/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-387165/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 387170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-113767-1	MW-14	Total/NA	Water	PrecSep_0	
280-113767-2	MW-15	Total/NA	Water	PrecSep_0	
280-113767-3	MW-15D	Total/NA	Water	PrecSep_0	
MB 160-387170/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-387170/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-387170/2-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: 280-113767-1

Client Sample ID: MW-14

Date Collected: 08/29/18 09:35

Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-1

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:06	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 01:53	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:40	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 19:38	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 04:15	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	429855	09/18/18 04:38	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	428633	09/05/18 15:21	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			749.64 mL	1.0 g	387165	09/05/18 08:39	JLC	TAL SL
Total/NA	Analysis	9315		1			391559	09/27/18 15:56	KLS	TAL SL
Total/NA	Prep	PrecSep_0			749.64 mL	1.0 g	387170	09/05/18 09:08	JLC	TAL SL
Total/NA	Analysis	9320		1			388838	09/13/18 09:30	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

Client Sample ID: MW-15

Date Collected: 08/29/18 10:55

Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-2

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:11	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 01:58	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:42	AJC	TAL CAN
Total/NA	Analysis	9040B		1			428861	09/06/18 21:14	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 05:00	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	429855	09/18/18 05:22	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	428633	09/05/18 15:21	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.20 mL	1.0 g	387165	09/05/18 08:39	JLC	TAL SL
Total/NA	Analysis	9315		1			391559	09/27/18 15:56	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.20 mL	1.0 g	387170	09/05/18 09:08	JLC	TAL SL
Total/NA	Analysis	9320		1			388838	09/13/18 09:30	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-15D

Lab Sample ID: 280-113767-3

Date Collected: 08/29/18 10:55

Matrix: Water

Date Received: 08/29/18 15:10

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:25	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 02:02	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:44	AJC	TAL CAN
Total/NA	Analysis	9040B		1			428861	09/06/18 21:18	SGB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	430024	09/18/18 20:13	ARM	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 05:44	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	428633	09/05/18 15:21	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.37 mL	1.0 g	387165	09/05/18 08:39	JLC	TAL SL
Total/NA	Analysis	9315		1			391559	09/27/18 15:56	KLS	TAL SL
Total/NA	Prep	PrecSep_0			1000.37 mL	1.0 g	387170	09/05/18 09:08	JLC	TAL SL
Total/NA	Analysis	9320		1			388838	09/13/18 09:30	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

Client Sample ID: MW15EB

Lab Sample ID: 280-113767-4

Date Collected: 08/29/18 11:10

Matrix: Water

Date Received: 08/29/18 15:10

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:30	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 02:07	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:46	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429537	09/12/18 19:50	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 06:06	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	429440	09/12/18 16:41	ARM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.18 mL	1.0 g	386896	09/04/18 10:50	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 10:02	MAR	TAL SL
Total/NA	Prep	PrecSep_0			1000.18 mL	1.0 g	386899	09/04/18 11:37	JLC	TAL SL
Total/NA	Analysis	9320		1			388373	09/11/18 16:49	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-113767-1

Client Sample ID: MW-16

Date Collected: 08/29/18 12:40

Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-5

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:35	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 02:12	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:48	AJC	TAL CAN
Total/NA	Analysis	9040B		1			428861	09/06/18 21:30	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 06:51	A1D	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	429855	09/18/18 07:13	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	428633	09/05/18 15:21	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.37 mL	1.0 g	386896	09/04/18 10:50	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 10:03	MAR	TAL SL
Total/NA	Prep	PrecSep_0			1000.37 mL	1.0 g	386899	09/04/18 11:37	JLC	TAL SL
Total/NA	Analysis	9320		1			388373	09/11/18 16:49	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

Client Sample ID: MW-17

Date Collected: 08/29/18 13:55

Date Received: 08/29/18 15:10

Lab Sample ID: 280-113767-6

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	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			344627	09/11/18 00:40	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	343748	09/04/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			346311	09/20/18 02:16	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	343751	09/04/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			343977	09/05/18 12:50	AJC	TAL CAN
Total/NA	Analysis	9040B		1			429073	09/07/18 18:43	SGB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	430024	09/18/18 21:42	ARM	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	429855	09/18/18 07:35	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	429855	09/18/18 08:42	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	428633	09/05/18 15:21	SGB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	428183	08/30/18 17:51	BJP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.16 mL	1.0 g	386896	09/04/18 10:50	JLC	TAL SL
Total/NA	Analysis	9315		1			391268	09/26/18 10:03	MAR	TAL SL
Total/NA	Prep	PrecSep_0			1000.16 mL	1.0 g	386899	09/04/18 11:37	JLC	TAL SL
Total/NA	Analysis	9320		1			388373	09/11/18 16:49	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			391721	09/28/18 10:58	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-113767-1

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

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Accreditation/Certification Summary

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

TestAmerica Job ID: 280-113767-1

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	01-08-19
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	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
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	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

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 ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18
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	11-30-18
Iowa	State Program	7	373	12-01-18
Kansas	NELAP	7	E-10236	10-31-18
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-113767-1

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	MO000542016-8	07-31-18 *
Virginia	NELAP	3	460230	06-14-19
Washington	State Program	10	C592	08-30-19
West Virginia DEP	State Program	3	381	10-31-18 *

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

TestAmerica Denver

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Sampler ID _____
 Temperature on Receipt _____
 Drinking Water? Yes ☐ No ☐

Chain of Custody Record

TAL-4124-280 (0508)

Client HDR, Inc	Project Manager Matt Rahr	Date 8/29/18	Chain of Custody Number 152852
Address 9781 Sheridan Blvd Ste 400	Telephone Number (Area Code)/Fax Number (303) 764-1537	Lab Number	Page 1 of 1
City Englewood	State CO	Zip Code 80112	
Project Name and Location (State) Xcel Cell - Cherokee (CO)	Site Contact Emily Muecke	Lab Contact Stephanie Rothmeyer	
Contract/Purchase Order/Quote No.	Carrier/Waybill Number	Analysis (Attach list if more space is needed)	Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Matrix			Containers & Preservatives					Analysis (Attach list if more space is needed)	
	Air	Aqueous	Sed	Soil	Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH
MW-14	X	X			3		3			
MW-15	X	X			3		3			
MW-15D	X	X			3		3			
MW-15EB	X	X			3		3			
MW-16	X	X			3		3			
MW-17	X	X			3		3			



280-113767 Chain of Custody

Possible Hazard Identification ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown	Sample Disposal ☒ Return To Client ☐ 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	QC Requirements (Specify)	
1. Relinquished By [Signature] Date 8/29/18 Time 1510	1. Received By [Signature] Date 8/29/18 Time 1510	
2. Relinquished By _____ Date _____ Time _____	2. Received By _____ Date _____ Time _____	
3. Relinquished By _____ Date _____ Time _____	3. Received By _____ Date _____ Time _____	
Comments 1.0, 0.6, +0.5 x feed by VAS 8/29/18		

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

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: Rothmeyer, Stephanie K	Carrier Tracking No(s):	COC No: 280-452928-1							
Shipping/Receiving						Phone:	E-Mail: stephanie.rothmeyer@testamericainc.com	State of Origin: Colorado	Page: 1 of 1							
Company: TestAmerica Laboratories, Inc.						Accreditations Required (See note): NELAP - Oregon			Job #: 280-113767-1							
Address: 13715 Rider Trail North, City: Earth City State, Zip: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email:						Due Date Requested: 9/25/2018 TAT Requested (days):			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 - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify) Other:							
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station						PO #:	WO #:	Project #: 28014371 SSOW#:	Analysis Requested							
Sample Identification - Client ID (Lab ID)						Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Swab, Soil, Other) BT=Tissue, A=Air	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PreSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PreSep_0 Radium-228 - 2/3 - SUB	Ra226Ra228_GFPIC (MOD) Local Method	Total Number of containers	Special Instructions/Note:
MW-14 (280-113767-1)						8/29/18	09:35 Mountain		Water	X	X	X	X	X	2	
MW-15 (280-113767-2)						8/29/18	10:55 Mountain		Water	X	X	X	X	X	2	
MW-15D (280-113767-3)						8/29/18	10:55 Mountain		Water	X	X	X	X	X	2	
MW15EB (280-113767-4)						8/29/18	11:10 Mountain		Water	X	X	X	X	X	2	
MW-16 (280-113767-5)						8/29/18	12:40 Mountain		Water	X	X	X	X	X	2	
MW-17 (280-113767-6)						8/29/18	13:55 Mountain		Water	X	X	X	X	X	2	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/test/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																
Deliverable Requested: I, II, III, IV, Other (specify)																
Primary Deliverable Rank: 4																
Date:																
Empty Kit Relinquished by:																
Relinquished by:																
Relinquished by:																
Relinquished by:																
Custody Seal Intact: Δ Yes Δ No																
Custody Seal No.:																



280- 13726 Login
PM Sara, Betsy A
Company: SCS Engineers

CONDITION UPON RECEIPT FORM

Client: Danier

Initiated by: JD Date: 8/31/18 Time: 0920 Shipper: FE Package Quantity: 4

*Numbered shipping lines correspond to Numbered Cooler and Sample Temp lines

**Sample must be received at < 6°- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid; Rad tests- Liquid or Solids; Perchlorate

Shipping #(s):*

1. 446768477695
2. 446768477662
3. 4467684776276
4. 446768477684
5. _____
6. _____
7. _____
8. _____
9. _____

Temp Thermometer #:

1. 2.3°C
2. 0.2°C
3. 1.3°C
4. 1.8°C
5. _____
6. _____
7. _____
8. _____
9. _____

Thermometer Package Temp:**

1. IR
2. IR
3. IR
4. IR
5. _____
6. _____
7. _____
8. _____
9. _____

Document #:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. ☒ Y ☐ N	Are there custody seals present on the cooler?	8. ☐ Y ☒ N	Are there custody seals present on bottles?
2. ☐ Y ☒ N ☐ N/A	Do custody seals on cooler appear to be tampered with?	9. ☐ Y ☐ N ☒ N/A	Do custody seals on bottles appear to be tampered with?
3. ☒ Y ☐ N	Were contents of cooler frisked after opening, but before unpacking?	10. ☒ Y ☐ N ☐ N/A	Was sample received with proper pH? (If not, make note below) pH strip lot #: <u>80A1771</u>
4. ☒ Y ☐ N	Sample received with Chain of Custody?	11. ☐ Y ☐ N ☒ N/A	Containers for Rn-222, C-14, Cl-36, H-3 & I-129/131 marked with "Do Not Preserve" label?
5. ☒ Y ☐ N ☐ N/A	Does the Chain of Custody match sample ID's on the container(s)?	12. ☒ Y ☐ N	Sample received in proper containers?
6. ☐ Y ☒ N	Was sample received broken?	13. ☐ Y ☐ N ☒ N/A	Headspace in VOA, or Rn-222 liquid samples? (>6mm) (If Yes, note sample ID's below)
7. ☒ Y ☐ N	Is sample volume sufficient for analysis?	14. ☐ Y ☐ N ☒ N/A	Soil containers for C-14, H-3, Tc-99 & I-129/131 marked with "Do Not Dry" label?

¹ For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX, Oil & Grease, Rn-222 and soils.

Notes:

Sample Labels Applied By: _____

Labels 2nd Reviewed By: _____

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

FOR SAMPLES THAT HAVE pH ADJUSTED, THE FOLLOWING INFORMATION MUST BE INCLUDED: INITIAL AND FINAL pH, pH STRIP LOT #, PRESERVATIVE LOT #, DATE/TIME OF PRESERVATION, AND AMOUNT OF PRESERVATIVE ADDED.

Phone (303) 736-0100 Fax (303) 431-7171

2019

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

[illegible]

TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : _____

Client TA Site Name TA Cooler unpacked by: Bu Dm
 Cooler Received on 6-31-16 Opened on 6-31-16
 FedEx: 1st Grd ☒ UPS ☐ FAS ☐ Clipper ☐ Client Drop Off ☐ TestAmerica Courier ☐ Other ☐

Receipt After-hours: Drop-off Date/Time

Storage Location

TestAmerica Cooler # _____ 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 °C) Observed Cooler Temp. 22 °C Corrected Cooler Temp. 22 °C
 IR GUN #36 (CF -0.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 2 ☒ 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 NA
 -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?
 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# HC849151
13. Were VOAs on the COC? ☒ Yes ☐ No
14. Were air bubbles >6 mm in any VOA vials? ☒ Yes ☐ No NA  Larger than this.
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): _____

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-113767-1

Login Number: 113767

List Source: TestAmerica Denver

List Number: 1

Creator: Staack, KiAundra A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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?	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.	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-113767-1

Login Number: 113767

List Number: 2

Creator: Hellm, Michael

List Source: TestAmerica St. Louis

List Creation: 08/31/18 03:58 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	2.3
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 $<6\text{mm}$ (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: 280-113767-1

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)	
280-113767-1	MW-14	94.4	
280-113767-2	MW-15	104	
280-113767-3	MW-15D	106	
280-113767-4	MW15EB	103	
280-113767-5	MW-16	98.2	
280-113767-6	MW-17	104	
LCS 160-386896/1-A	Lab Control Sample	102	
LCS 160-387165/1-A	Lab Control Sample	108	
LCSD 160-386896/2-A	Lab Control Sample Dup	100	
LCSD 160-387165/2-A	Lab Control Sample Dup	107	
MB 160-386896/23-A	Method Blank	88.2	
MB 160-387165/23-A	Method Blank	97.9	

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)
280-113767-1	MW-14	94.4	84.5
280-113767-2	MW-15	104	88.2
280-113767-3	MW-15D	106	78.1
280-113767-4	MW15EB	103	88.2
280-113767-5	MW-16	98.2	90.1
280-113767-6	MW-17	104	91.2
LCS 160-386899/1-A	Lab Control Sample	102	85.6
LCS 160-387170/1-A	Lab Control Sample	108	85.2
LCSD 160-386899/2-A	Lab Control Sample Dup	100	88.2
LCSD 160-387170/2-A	Lab Control Sample Dup	107	82.6
MB 160-386899/23-A	Method Blank	88.2	90.5
MB 160-387170/23-A	Method Blank	97.9	78.9

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: 280-114648-1

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:

10/24/2018 8:35:37 AM

Michelle Johnston, Project Manager II

(303)736-0110

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Designee for

Darlene Bandy, Project Manager I

(303)736-0188

darlene.bandy@testamericainc.com

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The test results in this report meet all 2003 NELAP 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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Definitions/Glossary

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

TestAmerica Job ID: 280-114648-1

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
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.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-114648-1

Job ID: 280-114648-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc.

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-114648-1

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 9/21/2018 12:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.4° C, 1.6° C and 2.0° C.

The RA226/RA228 Combined analyses were subcontracted to TestAmerica St. Louis.

The 6010C, 6020A and 7470A metals analyses were subcontracted to TestAmerica Canton.

TOTAL RECOVERABLE METALS

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/26/2018 and analyzed on 09/28/2018.

Calcium failed the recovery criteria low for the MS of sample MW-14MS (280-114648-1) in batch 240-347835.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

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-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 09/26/2018 and analyzed on 10/04/2018, 10/06/2018 and 10/08/2018.

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

TOTAL MERCURY

Case Narrative

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

TestAmerica Job ID: 280-114648-1

Job ID: 280-114648-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 09/26/2018 and analyzed on 09/27/2018.

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

TOTAL DISSOLVED SOLIDS

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/26/2018.

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

TOTAL SUSPENDED SOLIDS

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 09/25/2018.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 280-114532-1.

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

CORROSIVITY (PH)

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for Corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 09/26/2018.

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

ANIONS (28 DAYS)

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 10/04/2018.

Chloride, Fluoride and Sulfate failed the recovery criteria high for the MSD of sample 280-114911-8 in batch 280-432080. Fluoride and Sulfate also exceeded the RPD limit.

Samples MW-14 (280-114648-1)[5X], MW-15 (280-114648-2)[5X], MW-16 (280-114648-3)[10X], MW-16 (280-114648-3)[2X], MW-17 (280-114648-4)[5X] and MW-17-DUP (280-114648-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 09/26/2018 and analyzed on 10/18/2018.

Radium-226 was detected in method blank MB 160-391495/22-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.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

Case Narrative

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

TestAmerica Job ID: 280-114648-1

Job ID: 280-114648-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

Radium 226 Prep Batch 160-387165.

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

RADIUM-228

Samples MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 09/26/2018 and analyzed on 10/04/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

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-14 (280-114648-1), MW-15 (280-114648-2), MW-16 (280-114648-3), MW-17 (280-114648-4), MW-17-DUP (280-114648-5) and MW-15-EB (280-114648-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 10/22/2018.

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-14

Lab Sample ID: 280-114648-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.9		0.10	0.023	mg/L	1		6010C	Total
Calcium	210		5.0	0.31	mg/L	1		6010C	Recoverable
Barium	0.057		0.0050	0.0022	mg/L	1		6020A	Total
Cobalt	0.0020		0.0010	0.00019	mg/L	1		6020A	Recoverable
Molybdenum	0.024		0.010	0.0011	mg/L	1		6020A	Total
Selenium	0.0079		0.0050	0.00089	mg/L	1		6020A	Recoverable
Lithium	0.088		0.0080	0.0017	mg/L	1		6020A	Total
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Recoverable
Temperature	19.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	330		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	2.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	420		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1600		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.4		4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-15

Lab Sample ID: 280-114648-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3.3		0.10	0.023	mg/L	1		6010C	Total
Calcium	240		5.0	0.31	mg/L	1		6010C	Recoverable
Antimony	0.0019	J	0.0020	0.00057	mg/L	1		6020A	Total
Arsenic	0.0029	J	0.0050	0.00075	mg/L	1		6020A	Recoverable
Barium	0.087		0.0050	0.0022	mg/L	1		6020A	Total
Beryllium	0.00089	J	0.0010	0.00031	mg/L	1		6020A	Recoverable
Cadmium	0.00055	J	0.0010	0.00021	mg/L	1		6020A	Total
Cobalt	0.0031		0.0010	0.00019	mg/L	1		6020A	Recoverable
Molybdenum	0.054		0.010	0.0011	mg/L	1		6020A	Total
Selenium	0.0046	J	0.0050	0.00089	mg/L	1		6020A	Recoverable
Lithium	0.096		0.0080	0.0017	mg/L	1		6020A	Total
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU	1		9040B	Recoverable
Temperature	19.6	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	340		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.9		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	920		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-16

Lab Sample ID: 280-114648-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.94		0.10	0.023	mg/L	1			6010C	Total
Calcium	300		5.0	0.31	mg/L	1			6010C	Recoverable Total
Antimony	0.0011	J	0.0020	0.00057	mg/L	1			6020A	Recoverable Total
Arsenic	0.0033	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.060		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Beryllium	0.00051	J	0.0010	0.00031	mg/L	1			6020A	Recoverable Total
Cadmium	0.00042	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Cobalt	0.0015		0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Chromium	0.0015	J	0.0020	0.00098	mg/L	1			6020A	Recoverable Total
Molybdenum	0.026		0.010	0.0011	mg/L	1			6020A	Recoverable Total
Lead	0.00050	J	0.0010	0.00045	mg/L	1			6020A	Recoverable Total
Selenium	0.0072		0.0050	0.00089	mg/L	1			6020A	Recoverable Total
Lithium	0.11		0.0080	0.0017	mg/L	1			6020A	Recoverable Total
pH adj. to 25 deg C	7.6	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	490		30	2.5	mg/L	10			9056A	Total/NA
Fluoride	2.4		1.0	0.12	mg/L	2			9056A	Total/NA
Sulfate	1100		50	2.3	mg/L	10			9056A	Total/NA
Total Dissolved Solids (TDS)	2600		40	19	mg/L	1			SM 2540C	Total/NA
Total Suspended Solids	3.6	J	4.0	1.1	mg/L	1			SM 2540D	Total/NA

Client Sample ID: MW-17

Lab Sample ID: 280-114648-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	1.1		0.10	0.023	mg/L	1			6010C	Total
Calcium	190		5.0	0.31	mg/L	1			6010C	Recoverable Total
Antimony	0.00068	J	0.0020	0.00057	mg/L	1			6020A	Recoverable Total
Arsenic	0.0044	J	0.0050	0.00075	mg/L	1			6020A	Recoverable Total
Barium	0.042		0.0050	0.0022	mg/L	1			6020A	Recoverable Total
Beryllium	0.00034	J	0.0010	0.00031	mg/L	1			6020A	Recoverable Total
Cadmium	0.00072	J	0.0010	0.00021	mg/L	1			6020A	Recoverable Total
Cobalt	0.00076	J	0.0010	0.00019	mg/L	1			6020A	Recoverable Total
Chromium	0.0011	J	0.0020	0.00098	mg/L	1			6020A	Recoverable Total

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-17 (Continued)

Lab Sample ID: 280-114648-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Molybdenum	0.018		0.010	0.0011	mg/L		1		6020A	Total Recoverable
Selenium	0.0076		0.0050	0.00089	mg/L		1		6020A	Total Recoverable
Lithium	0.058		0.0080	0.0017	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	19.6	HF	1.0	1.0	Degrees C		1		9040B	Total/NA
Chloride	270		15	1.3	mg/L		5		9056A	Total/NA
Fluoride	2.2		0.50	0.060	mg/L		1		9056A	Total/NA
Sulfate	560		25	1.2	mg/L		5		9056A	Total/NA
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L		1		SM 2540C	Total/NA

Client Sample ID: MW-17-DUP

Lab Sample ID: 280-114648-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.97		0.10	0.023	mg/L		1		6010C	Total Recoverable
Calcium	170		5.0	0.31	mg/L		1		6010C	Total Recoverable
Antimony	0.00058	J	0.0020	0.00057	mg/L		1		6020A	Total Recoverable
Arsenic	0.0043	J	0.0050	0.00075	mg/L		1		6020A	Total Recoverable
Barium	0.040		0.0050	0.0022	mg/L		1		6020A	Total Recoverable
Cadmium	0.00074	J	0.0010	0.00021	mg/L		1		6020A	Total Recoverable
Cobalt	0.00072	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	0.0073		0.0050	0.00089	mg/L		1		6020A	Total Recoverable
Lithium	0.056		0.0080	0.0017	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	20.1	HF	1.0	1.0	Degrees C		1		9040B	Total/NA
Chloride	270		15	1.3	mg/L		5		9056A	Total/NA
Fluoride	2.2		0.50	0.060	mg/L		1		9056A	Total/NA
Sulfate	570		25	1.2	mg/L		5		9056A	Total/NA
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L		1		SM 2540C	Total/NA

Client Sample ID: MW-15-EB

Lab Sample ID: 280-114648-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
pH adj. to 25 deg C	5.6	HF	0.1	0.1	SU		1		9040B	Total/NA
Temperature	19.8	HF	1.0	1.0	Degrees C		1		9040B	Total/NA
Total Dissolved Solids (TDS)	28		20	9.4	mg/L		1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

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

TestAmerica Job ID: 280-114648-1

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: 280-114648-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-114648-1	MW-14	Water	09/20/18 16:25	09/21/18 12:45
280-114648-2	MW-15	Water	09/20/18 14:45	09/21/18 12:45
280-114648-3	MW-16	Water	09/20/18 13:15	09/21/18 12:45
280-114648-4	MW-17	Water	09/20/18 11:40	09/21/18 12:45
280-114648-5	MW-17-DUP	Water	09/20/18 11:50	09/21/18 12:45
280-114648-6	MW-15-EB	Water	09/20/18 15:15	09/21/18 12:45

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.9		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 22:36	1
Calcium	210		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 22:36	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3.3		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 22:59	1
Calcium	240		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 22:59	1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.94		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 23:13	1
Calcium	300		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 23:13	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.1		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 23:18	1
Calcium	190		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 23:18	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.97		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 23:23	1
Calcium	170		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 23:23	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 23:28	1
Calcium	ND		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 23:28	1

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

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/26/18 14:00	10/06/18 00:00	1
Arsenic	ND		0.0050	0.00075	mg/L		09/26/18 14:00	10/06/18 00:00	1
Barium	0.057		0.0050	0.0022	mg/L		09/26/18 14:00	10/06/18 00:00	1
Beryllium	ND		0.0010	0.00031	mg/L		09/26/18 14:00	10/08/18 13:54	1
Cadmium	ND		0.0010	0.00021	mg/L		09/26/18 14:00	10/06/18 00:00	1
Cobalt	0.0020		0.0010	0.00019	mg/L		09/26/18 14:00	10/06/18 00:00	1
Chromium	ND		0.0020	0.00098	mg/L		09/26/18 14:00	10/06/18 00:00	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	0.024		0.010	0.0011	mg/L		09/26/18 14:00	10/06/18 00:00	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/06/18 00:00	1
Selenium	0.0079		0.0050	0.00089	mg/L		09/26/18 14:00	10/06/18 00:00	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/06/18 00:00	1
Lithium	0.088		0.0080	0.0017	mg/L		09/26/18 14:00	10/08/18 13:54	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0019	J	0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 17:39	1
Arsenic	0.0029	J	0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 17:39	1
Barium	0.087		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 17:39	1
Beryllium	0.00089	J	0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 17:39	1
Cadmium	0.00055	J	0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 17:39	1
Cobalt	0.0031		0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 17:39	1
Chromium	ND		0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 17:39	1
Molybdenum	0.054		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 17:39	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 17:39	1
Selenium	0.0046	J	0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 17:39	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 17:39	1
Lithium	0.096		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 17:39	1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0011	J	0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 17:43	1
Arsenic	0.0033	J	0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 17:43	1
Barium	0.060		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 17:43	1
Beryllium	0.00051	J	0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 17:43	1
Cadmium	0.00042	J	0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 17:43	1
Cobalt	0.0015		0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 17:43	1
Chromium	0.0015	J	0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 17:43	1
Molybdenum	0.026		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 17:43	1
Lead	0.00050	J	0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 17:43	1
Selenium	0.0072		0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 17:43	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 17:43	1
Lithium	0.11		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 17:43	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00068	J	0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 17:48	1
Arsenic	0.0044	J	0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 17:48	1
Barium	0.042		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 17:48	1
Beryllium	0.00034	J	0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 17:48	1
Cadmium	0.00072	J	0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 17:48	1
Cobalt	0.00076	J	0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 17:48	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.0011	J	0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 17:48	1
Molybdenum	0.018		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 17:48	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 17:48	1
Selenium	0.0076		0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 17:48	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 17:48	1
Lithium	0.058		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 17:48	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00058	J	0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 18:01	1
Arsenic	0.0043	J	0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 18:01	1
Barium	0.040		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 18:01	1
Beryllium	ND		0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 18:01	1
Cadmium	0.00074	J	0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 18:01	1
Cobalt	0.00072	J	0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 18:01	1
Chromium	ND		0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 18:01	1
Molybdenum	0.019		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 18:01	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 18:01	1
Selenium	0.0073		0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 18:01	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 18:01	1
Lithium	0.056		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 18:01	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 18:06	1
Arsenic	ND		0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 18:06	1
Barium	ND		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 18:06	1
Beryllium	ND		0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 18:06	1
Cadmium	ND		0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 18:06	1
Cobalt	ND		0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 18:06	1
Chromium	ND		0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 18:06	1
Molybdenum	ND		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 18:06	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 18:06	1
Selenium	ND		0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 18:06	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 18:06	1
Lithium	ND		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 18:06	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/26/18 14:00	09/27/18 10:15	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	09/26/18 14:00	09/27/18 10:21	1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	09/26/18 14:00	09/27/18 10:24	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	09/26/18 14:00	09/27/18 10:26	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	09/26/18 14:00	09/27/18 10:28	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	09/26/18 14:00	09/27/18 10:30	1

General Chemistry

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
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	-		09/26/18 09:07	1
Temperature	19.5	HF	1.0	1.0	Degrees C			09/26/18 09:07	1
Chloride	330		15	1.3	mg/L			10/04/18 18:14	5
Fluoride	2.1		0.50	0.060	mg/L			10/04/18 17:56	1
Sulfate	420		25	1.2	mg/L			10/04/18 18:14	5
Total Dissolved Solids (TDS)	1600		20	9.4	mg/L			09/26/18 09:44	1
Total Suspended Solids	4.4		4.0	1.1	mg/L			09/25/18 13:07	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
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	-		09/26/18 08:59	1
Temperature	19.6	HF	1.0	1.0	Degrees C			09/26/18 08:59	1
Chloride	340		15	1.3	mg/L			10/04/18 19:04	5
Fluoride	1.9		0.50	0.060	mg/L			10/04/18 18:46	1
Sulfate	920		25	1.2	mg/L			10/04/18 19:04	5
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L			09/26/18 09:44	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			09/25/18 13:07	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			09/26/18 09:17	1
Temperature	20.4	HF	1.0	1.0	Degrees C			09/26/18 09:17	1
Chloride	490		30	2.5	mg/L			10/04/18 19:41	10
Fluoride	2.4		1.0	0.12	mg/L			10/04/18 19:22	2
Sulfate	1100		50	2.3	mg/L			10/04/18 19:41	10
Total Dissolved Solids (TDS)	2600		40	19	mg/L			09/26/18 09:44	1
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			09/25/18 13:07	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
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			09/26/18 09:03	1
Temperature	19.6	HF	1.0	1.0	Degrees C			09/26/18 09:03	1
Chloride	270		15	1.3	mg/L			10/04/18 20:19	5
Fluoride	2.2		0.50	0.060	mg/L			10/04/18 20:00	1
Sulfate	560		25	1.2	mg/L			10/04/18 20:19	5
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L			09/26/18 09:44	1
Total Suspended Solids	ND		4.0	1.1	mg/L			09/25/18 13:07	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

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			09/26/18 09:21	1
Temperature	20.1	HF	1.0	1.0	Degrees C			09/26/18 09:21	1
Chloride	270		15	1.3	mg/L			10/04/18 20:56	5
Fluoride	2.2		0.50	0.060	mg/L			10/04/18 20:37	1
Sulfate	570		25	1.2	mg/L			10/04/18 20:56	5
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L			09/26/18 09:44	1
Total Suspended Solids	ND		4.0	1.1	mg/L			09/25/18 13:07	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
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			09/26/18 14:28	1
Temperature	19.8	HF	1.0	1.0	Degrees C			09/26/18 14:28	1
Chloride	ND		3.0	0.25	mg/L			10/04/18 21:52	1
Fluoride	ND		0.50	0.060	mg/L			10/04/18 21:52	1
Sulfate	ND		5.0	0.23	mg/L			10/04/18 21:52	1
Total Dissolved Solids (TDS)	28		20	9.4	mg/L			09/26/18 09:44	1
Total Suspended Solids	ND		4.0	1.1	mg/L			09/25/18 13:07	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.503		0.124	0.132	1.00	0.0921	pCi/L	09/26/18 12:22	10/18/18 10:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	107		40 - 110					09/26/18 12:22	10/18/18 10:13	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.379		0.109	0.115	1.00	0.0919	pCi/L	09/26/18 12:22	10/18/18 10:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					09/26/18 12:22	10/18/18 10:13	1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.604		0.129	0.140	1.00	0.0723	pCi/L	09/26/18 12:22	10/18/18 10:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					09/26/18 12:22	10/18/18 10:13	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.379		0.105	0.111	1.00	0.0853	pCi/L	09/26/18 12:22	10/18/18 10:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					09/26/18 12:22	10/18/18 10:14	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.348		0.0999	0.105	1.00	0.0792	pCi/L	09/26/18 12:22	10/18/18 10:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					09/26/18 12:22	10/18/18 10:14	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.295		0.0912	0.0950	1.00	0.0715	pCi/L	09/26/18 12:22	10/18/18 10:14	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110					09/26/18 12:22	10/18/18 10:14	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.212	U	0.192	0.193	1.00	0.307	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	107		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	86.4		40 - 110					09/26/18 14:25	10/04/18 09:19	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.672		0.237	0.245	1.00	0.320	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	88.2		40 - 110					09/26/18 14:25	10/04/18 09:19	1

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.905		0.247	0.260	1.00	0.303	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	90.1		40 - 110					09/26/18 14:25	10/04/18 09:19	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.547		0.215	0.221	1.00	0.291	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	89.7		40 - 110					09/26/18 14:25	10/04/18 09:19	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.906		0.256	0.269	1.00	0.314	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	82.6		40 - 110					09/26/18 14:25	10/04/18 09:19	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.138	U	0.215	0.215	1.00	0.361	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110					09/26/18 14:25	10/04/18 09:19	1
Y Carrier	83.7		40 - 110					09/26/18 14:25	10/04/18 09:19	1

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

Client Sample ID: MW-14
Date Collected: 09/20/18 16:25
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.716		0.229	0.234	5.00	0.307	pCi/L		10/22/18 12:27	1

Client Sample ID: MW-15
Date Collected: 09/20/18 14:45
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.05		0.261	0.271	5.00	0.320	pCi/L		10/22/18 12:27	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Client Sample ID: MW-16
Date Collected: 09/20/18 13:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.51		0.279	0.295	5.00	0.303	pCi/L		10/22/18 12:27	1

Client Sample ID: MW-17
Date Collected: 09/20/18 11:40
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.925		0.239	0.247	5.00	0.291	pCi/L		10/22/18 12:27	1

Client Sample ID: MW-17-DUP
Date Collected: 09/20/18 11:50
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.25		0.275	0.289	5.00	0.314	pCi/L		10/22/18 12:27	1

Client Sample ID: MW-15-EB
Date Collected: 09/20/18 15:15
Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.433		0.234	0.235	5.00	0.361	pCi/L		10/22/18 12:27	1

QC Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-347288/1-A
Matrix: Water
Analysis Batch: 347835

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		09/26/18 14:00	09/28/18 22:27	1
Calcium	ND		5.0	0.31	mg/L		09/26/18 14:00	09/28/18 22:27	1

Lab Sample ID: LCS 240-347288/2-A
Matrix: Water
Analysis Batch: 347835

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.10		mg/L		110	80 - 120
Calcium	50.0	49.4		mg/L		99	80 - 120

Lab Sample ID: 280-114648-1 MS
Matrix: Water
Analysis Batch: 347835

Client Sample ID: MW-14
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.9		1.00	2.84		mg/L		94	75 - 125
Calcium	210		50.0	248	4	mg/L		68	75 - 125

Lab Sample ID: 280-114648-1 MSD
Matrix: Water
Analysis Batch: 347835

Client Sample ID: MW-14
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	1.9		1.00	2.94		mg/L		104	75 - 125	3	20
Calcium	210		50.0	254	4	mg/L		81	75 - 125	3	20

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-347288/1-A
Matrix: Water
Analysis Batch: 348723

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		09/26/18 14:00	10/04/18 17:07	1
Arsenic	ND		0.0050	0.00075	mg/L		09/26/18 14:00	10/04/18 17:07	1
Barium	ND		0.0050	0.0022	mg/L		09/26/18 14:00	10/04/18 17:07	1
Beryllium	ND		0.0010	0.00031	mg/L		09/26/18 14:00	10/04/18 17:07	1
Cadmium	ND		0.0010	0.00021	mg/L		09/26/18 14:00	10/04/18 17:07	1
Cobalt	ND		0.0010	0.00019	mg/L		09/26/18 14:00	10/04/18 17:07	1
Chromium	ND		0.0020	0.00098	mg/L		09/26/18 14:00	10/04/18 17:07	1
Molybdenum	ND		0.010	0.0011	mg/L		09/26/18 14:00	10/04/18 17:07	1
Lead	ND		0.0010	0.00045	mg/L		09/26/18 14:00	10/04/18 17:07	1
Selenium	ND		0.0050	0.00089	mg/L		09/26/18 14:00	10/04/18 17:07	1
Thallium	ND		0.0010	0.00020	mg/L		09/26/18 14:00	10/04/18 17:07	1
Lithium	ND		0.0080	0.0017	mg/L		09/26/18 14:00	10/04/18 17:07	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Lab Sample ID: LCS 240-347288/3-A
Matrix: Water
Analysis Batch: 348723

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 347288

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.100	0.0976		mg/L		98	80 - 120
Arsenic	1.00	0.946		mg/L		95	80 - 120
Barium	1.00	0.916		mg/L		92	80 - 120
Beryllium	1.00	0.938		mg/L		94	80 - 120
Cadmium	1.00	0.973		mg/L		97	80 - 120
Cobalt	1.00	0.968		mg/L		97	80 - 120
Chromium	1.00	0.940		mg/L		94	80 - 120
Molybdenum	0.100	0.100		mg/L		100	80 - 120
Lead	1.00	0.950		mg/L		95	80 - 120
Selenium	1.00	0.950		mg/L		95	80 - 120
Thallium	0.250	0.240		mg/L		96	80 - 120
Lithium	0.100	0.101		mg/L		101	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-347291/1-A
Matrix: Water
Analysis Batch: 347555

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 347291

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		09/26/18 14:00	09/27/18 10:11	1

Lab Sample ID: LCS 240-347291/2-A
Matrix: Water
Analysis Batch: 347555

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 347291

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	5.00	5.06		ug/L		101	80 - 120

Lab Sample ID: 280-114648-1 MS
Matrix: Water
Analysis Batch: 347555

Client Sample ID: MW-14
Prep Type: Total/NA
Prep Batch: 347291

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		1.00	1.13		ug/L		113	80 - 120

Lab Sample ID: 280-114648-1 MSD
Matrix: Water
Analysis Batch: 347555

Client Sample ID: MW-14
Prep Type: Total/NA
Prep Batch: 347291

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		1.00	1.12		ug/L		112	80 - 120	0	20

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-114648-1

Method: 9040B - pH

Lab Sample ID: LCS 280-431056/29

Matrix: Water

Analysis Batch: 431056

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: LCS 280-431246/4

Matrix: Water

Analysis Batch: 431246

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 280-432080/6

Matrix: Water

Analysis Batch: 432080

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	0.25	mg/L			10/04/18 12:31	1
Fluoride	ND		0.50	0.060	mg/L			10/04/18 12:31	1
Sulfate	ND		5.0	0.23	mg/L			10/04/18 12:31	1

Lab Sample ID: LCS 280-432080/4

Matrix: Water

Analysis Batch: 432080

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	96.7		mg/L		97	90 - 110
Fluoride	5.00	5.09		mg/L		102	90 - 110
Sulfate	100	99.1		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-432080/5

Matrix: Water

Analysis Batch: 432080

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	96.7		mg/L		97	90 - 110	0	10
Fluoride	5.00	5.09		mg/L		102	90 - 110	0	10
Sulfate	100	99.3		mg/L		99	90 - 110	0	10

Lab Sample ID: MRL 280-432080/3

Matrix: Water

Analysis Batch: 432080

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.69	J	mg/L		108	50 - 150
Fluoride	0.200	0.195	J	mg/L		98	50 - 150
Sulfate	2.50	2.67	J	mg/L		107	50 - 150

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-114648-1

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

Lab Sample ID: MB 280-431058/1
Matrix: Water
Analysis Batch: 431058

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			09/26/18 09:44	1

Lab Sample ID: LCS 280-431058/2
Matrix: Water
Analysis Batch: 431058

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	502		mg/L		100	86 - 110

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

Lab Sample ID: MB 280-430922/1
Matrix: Water
Analysis Batch: 430922

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			09/25/18 13:07	1

Lab Sample ID: LCS 280-430922/2
Matrix: Water
Analysis Batch: 430922

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	86.8		mg/L		87	86 - 114

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-391495/22-A
Matrix: Water
Analysis Batch: 395728

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 391495

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.2472		0.0783	0.0814	1.00	0.0579	pCi/L	09/26/18 12:22	10/18/18 10:21	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					09/26/18 12:22	10/18/18 10:21	1

Lab Sample ID: LCS 160-391495/1-A
Matrix: Water
Analysis Batch: 395727

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 391495

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	10.55		1.10	1.00	0.0845	pCi/L	93	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	109		40 - 110						

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-114648-1

Lab Sample ID: LCSD 160-391495/2-A

Matrix: Water

Analysis Batch: 395727

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 391495

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226			11.4	10.93		1.11	1.00	0.0737	pCi/L	96	68 - 137	0.17	1
Carrier		LCSD %Yield	LCSD Qualifier	Limits									
Ba Carrier		106		40 - 110									

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-391517/22-A

Matrix: Water

Analysis Batch: 392951

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 391517

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2751	U	0.190	0.192	1.00	0.291	pCi/L	09/26/18 14:25	10/04/18 09:19	1
Carrier		MB %Yield	MB Qualifier	Limits						
Ba Carrier		110		40 - 110						
Y Carrier		83.0		40 - 110						

Lab Sample ID: LCS 160-391517/1-A

Matrix: Water

Analysis Batch: 392951

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 391517

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			10.9	9.977		1.11	1.00	0.351	pCi/L	91	56 - 140		
Carrier		LCS %Yield	LCS Qualifier	Limits									
Ba Carrier		109		40 - 110									
Y Carrier		87.1		40 - 110									

Lab Sample ID: LCSD 160-391517/2-A

Matrix: Water

Analysis Batch: 392951

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 391517

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228			10.9	9.895		1.12	1.00	0.343	pCi/L	91	56 - 140	0.04	1
Carrier		LCSD %Yield	LCSD Qualifier	Limits									
Ba Carrier		106		40 - 110									
Y Carrier		85.6		40 - 110									

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-114648-1

Metals

Prep Batch: 347288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total Recoverable	Water	3005A	
280-114648-2	MW-15	Total Recoverable	Water	3005A	
280-114648-3	MW-16	Total Recoverable	Water	3005A	
280-114648-4	MW-17	Total Recoverable	Water	3005A	
280-114648-5	MW-17-DUP	Total Recoverable	Water	3005A	
280-114648-6	MW-15-EB	Total Recoverable	Water	3005A	
MB 240-347288/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-347288/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-347288/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-114648-1 MS	MW-14	Total Recoverable	Water	3005A	
280-114648-1 MSD	MW-14	Total Recoverable	Water	3005A	

Prep Batch: 347291

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	7470A	
280-114648-2	MW-15	Total/NA	Water	7470A	
280-114648-3	MW-16	Total/NA	Water	7470A	
280-114648-4	MW-17	Total/NA	Water	7470A	
280-114648-5	MW-17-DUP	Total/NA	Water	7470A	
280-114648-6	MW-15-EB	Total/NA	Water	7470A	
MB 240-347291/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-347291/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-114648-1 MS	MW-14	Total/NA	Water	7470A	
280-114648-1 MSD	MW-14	Total/NA	Water	7470A	

Analysis Batch: 347555

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	7470A	347291
280-114648-2	MW-15	Total/NA	Water	7470A	347291
280-114648-3	MW-16	Total/NA	Water	7470A	347291
280-114648-4	MW-17	Total/NA	Water	7470A	347291
280-114648-5	MW-17-DUP	Total/NA	Water	7470A	347291
280-114648-6	MW-15-EB	Total/NA	Water	7470A	347291
MB 240-347291/1-A	Method Blank	Total/NA	Water	7470A	347291
LCS 240-347291/2-A	Lab Control Sample	Total/NA	Water	7470A	347291
280-114648-1 MS	MW-14	Total/NA	Water	7470A	347291
280-114648-1 MSD	MW-14	Total/NA	Water	7470A	347291

Analysis Batch: 347835

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total Recoverable	Water	6010C	347288
280-114648-2	MW-15	Total Recoverable	Water	6010C	347288
280-114648-3	MW-16	Total Recoverable	Water	6010C	347288
280-114648-4	MW-17	Total Recoverable	Water	6010C	347288
280-114648-5	MW-17-DUP	Total Recoverable	Water	6010C	347288
280-114648-6	MW-15-EB	Total Recoverable	Water	6010C	347288
MB 240-347288/1-A	Method Blank	Total Recoverable	Water	6010C	347288
LCS 240-347288/2-A	Lab Control Sample	Total Recoverable	Water	6010C	347288
280-114648-1 MS	MW-14	Total Recoverable	Water	6010C	347288
280-114648-1 MSD	MW-14	Total Recoverable	Water	6010C	347288

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-114648-1

Metals (Continued)

Analysis Batch: 348723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-2	MW-15	Total Recoverable	Water	6020A	347288
280-114648-3	MW-16	Total Recoverable	Water	6020A	347288
280-114648-4	MW-17	Total Recoverable	Water	6020A	347288
280-114648-5	MW-17-DUP	Total Recoverable	Water	6020A	347288
280-114648-6	MW-15-EB	Total Recoverable	Water	6020A	347288
MB 240-347288/1-A	Method Blank	Total Recoverable	Water	6020A	347288
LCS 240-347288/3-A	Lab Control Sample	Total Recoverable	Water	6020A	347288

Analysis Batch: 348929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total Recoverable	Water	6020A	347288

Analysis Batch: 349122

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total Recoverable	Water	6020A	347288

General Chemistry

Analysis Batch: 430922

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	SM 2540D	
280-114648-2	MW-15	Total/NA	Water	SM 2540D	
280-114648-3	MW-16	Total/NA	Water	SM 2540D	
280-114648-4	MW-17	Total/NA	Water	SM 2540D	
280-114648-5	MW-17-DUP	Total/NA	Water	SM 2540D	
280-114648-6	MW-15-EB	Total/NA	Water	SM 2540D	
MB 280-430922/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-430922/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 431056

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	9040B	
280-114648-2	MW-15	Total/NA	Water	9040B	
280-114648-3	MW-16	Total/NA	Water	9040B	
280-114648-4	MW-17	Total/NA	Water	9040B	
280-114648-5	MW-17-DUP	Total/NA	Water	9040B	
LCS 280-431056/29	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 431058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	SM 2540C	
280-114648-2	MW-15	Total/NA	Water	SM 2540C	
280-114648-3	MW-16	Total/NA	Water	SM 2540C	
280-114648-4	MW-17	Total/NA	Water	SM 2540C	
280-114648-5	MW-17-DUP	Total/NA	Water	SM 2540C	
280-114648-6	MW-15-EB	Total/NA	Water	SM 2540C	
MB 280-431058/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-431058/2	Lab Control Sample	Total/NA	Water	SM 2540C	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-114648-1

General Chemistry (Continued)

Analysis Batch: 431246

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-6	MW-15-EB	Total/NA	Water	9040B	
LCS 280-431246/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 432080

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	9056A	
280-114648-1	MW-14	Total/NA	Water	9056A	
280-114648-2	MW-15	Total/NA	Water	9056A	
280-114648-2	MW-15	Total/NA	Water	9056A	
280-114648-3	MW-16	Total/NA	Water	9056A	
280-114648-3	MW-16	Total/NA	Water	9056A	
280-114648-4	MW-17	Total/NA	Water	9056A	
280-114648-4	MW-17	Total/NA	Water	9056A	
280-114648-5	MW-17-DUP	Total/NA	Water	9056A	
280-114648-5	MW-17-DUP	Total/NA	Water	9056A	
280-114648-6	MW-15-EB	Total/NA	Water	9056A	
MB 280-432080/6	Method Blank	Total/NA	Water	9056A	
LCS 280-432080/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-432080/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-432080/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 391495

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	PrecSep-21	
280-114648-2	MW-15	Total/NA	Water	PrecSep-21	
280-114648-3	MW-16	Total/NA	Water	PrecSep-21	
280-114648-4	MW-17	Total/NA	Water	PrecSep-21	
280-114648-5	MW-17-DUP	Total/NA	Water	PrecSep-21	
280-114648-6	MW-15-EB	Total/NA	Water	PrecSep-21	
MB 160-391495/22-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-391495/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-391495/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 391517

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-114648-1	MW-14	Total/NA	Water	PrecSep_0	
280-114648-2	MW-15	Total/NA	Water	PrecSep_0	
280-114648-3	MW-16	Total/NA	Water	PrecSep_0	
280-114648-4	MW-17	Total/NA	Water	PrecSep_0	
280-114648-5	MW-17-DUP	Total/NA	Water	PrecSep_0	
280-114648-6	MW-15-EB	Total/NA	Water	PrecSep_0	
MB 160-391517/22-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-391517/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-391517/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-14

Date Collected: 09/20/18 16:25

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-1

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 22:36	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348929	10/06/18 00:00	DSH	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			349122	10/08/18 13:54	RKT	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:15	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431056	09/26/18 09:07	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	432080	10/04/18 17:56	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	432080	10/04/18 18:14	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.41 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:13	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.41 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	TAL SL

Client Sample ID: MW-15

Date Collected: 09/20/18 14:45

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-2

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 22:59	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348723	10/04/18 17:39	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:21	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431056	09/26/18 08:59	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	432080	10/04/18 18:46	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	432080	10/04/18 19:04	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.02 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:13	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.02 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-16

Date Collected: 09/20/18 13:15

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-3

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 23:13	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348723	10/04/18 17:43	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:24	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431056	09/26/18 09:17	SGB	TAL DEN
Total/NA	Analysis	9056A		2	5 mL	5 mL	432080	10/04/18 19:22	A1D	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	432080	10/04/18 19:41	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.12 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:13	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.12 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	TAL SL

Client Sample ID: MW-17

Date Collected: 09/20/18 11:40

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-4

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 23:18	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348723	10/04/18 17:48	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:26	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431056	09/26/18 09:03	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	432080	10/04/18 20:00	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	432080	10/04/18 20:19	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.95 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:14	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.95 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-114648-1

Client Sample ID: MW-17-DUP

Date Collected: 09/20/18 11:50

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-5

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 23:23	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348723	10/04/18 18:01	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:28	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431056	09/26/18 09:21	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	432080	10/04/18 20:37	A1D	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	432080	10/04/18 20:56	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.34 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:14	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.34 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	TAL SL

Client Sample ID: MW-15-EB

Date Collected: 09/20/18 15:15

Date Received: 09/21/18 12:45

Lab Sample ID: 280-114648-6

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	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			347835	09/28/18 23:28	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	347288	09/26/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			348723	10/04/18 18:06	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	347291	09/26/18 14:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			347555	09/27/18 10:30	AJC	TAL CAN
Total/NA	Analysis	9040B		1			431246	09/26/18 14:28	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	432080	10/04/18 21:52	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	431058	09/26/18 09:44	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	430922	09/25/18 13:07	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.19 mL	1.0 g	391495	09/26/18 12:22	JLC	TAL SL
Total/NA	Analysis	9315		1			395878	10/18/18 10:14	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.19 mL	1.0 g	391517	09/26/18 14:25	JLC	TAL SL
Total/NA	Analysis	9320		1			392951	10/04/18 09:19	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			396635	10/22/18 12:27	RTM	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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-114648-1

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	01-08-19
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	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
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	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

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 ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
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	11-30-18
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-18 *
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-114648-1

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	10-31-18 *

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

TestAmerica Denver

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

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact		Project Manager: Matt Rohr Tel/Fax: 303-764-537		Site Contact: Kaitlin Fishburn		Date: _____	
HDR Inc		Tel/Fax: 303-764-537		Lab Contact:		COC No: _____ of _____ COCs	
1670 Broadway, Suite 3400		Analysis Turnaround Time		App III - Total Metals: Calcium, Boron		Sampler:	
Denver, CO 80202		☐ CALENDAR DAYS ☐ WORKING DAYS		App IV Total Metals (see list)		For Lab Use Only:	
(907) 644-2078		TAT if different from Below _____		Ra226/Ra228 combined		Walk-in Client:	
Matt.Rohr@hdrinc.com		☐ 2 weeks		PH, Fluoride, Chloride, Sulfate		Lab Sampling:	
Email		☐ 1 week		Total Dissolved Solids		Job / SDG No.:	
Project Name: Xcel Energy GW CCR		☐ 2 days		Total Suspended Solids		App IV Metals: Sb, As, Ba, Be, Cd,	
Site: CHEROKEE		☐ 1 day		Filtered Sample (Y / N)		Cr, Co, Pb, Li, Hg, Mo, Se, Ti, F	
PO #				# of Cont.			
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix		
MW-14		9/20	1625	G	W	X	
MW-15		9/20	1445	G	W	X	
MW-16		9/20	1315	G	W	X	
MW-17		9/20	1140	G	W	X	
MW-17- DUP		9/20	1150	G	W	X	
MW-15- EB		9/20	1515	G	W	X	
 280-114648 Chain of Custody							
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other							
Possible Hazard Identification: Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.							
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown							
Special Instructions/QC Requirements & Comments:							
3 coolers							
Custody Seals Intact: ☐ Yes ☐ No		Custody Seal No.:		Cooler Temp. (°C): Obs'd:		Therm ID No.:	
Relinquished by: K. Fishburn		Company: HDR		Received by: [Signature]		Company: DEN	
Relinquished by:		Company:		Date/Time: 9/20/18		Date/Time: 9/20/18	
Relinquished by:		Company:		Date/Time:		Date/Time:	

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) Client Contact: Bandy, Darlene F Shipping/Receiving: darlene.bandy@testamericainc.com Company: TestAmerica Laboratories, Inc. Address: 13715 Rider Trail North City: Gluc State: MO Zip: 63043 Phone: 314-298-8586 (Tel) 314-298-8757 (Fax) Email:		Lab POC: Bandy, Darlene F E-Mail: darlene.bandy@testamericainc.com Accreditation Required (See note): NELAP - Oregon		Carrier Tracking No(s): 280-455894-1 State of Origin: Colorado Job #: 280-114648-1 Preservation Codes: <table border="1"> <tr> <td>A - HCL</td> <td>M - Hexate</td> </tr> <tr> <td>B - NaOH</td> <td>N - None</td> </tr> <tr> <td>C - Zn Acetate</td> <td>Q - AsNaO2</td> </tr> <tr> <td>D - Nitric Acid</td> <td>P - Na2O4S</td> </tr> <tr> <td>E - NaHSO4</td> <td>Q - Na2SO3</td> </tr> <tr> <td>F - MeOH</td> <td>R - Na2S2O3</td> </tr> <tr> <td>G - Amchlor</td> <td>S - H2SO4</td> </tr> <tr> <td>H - Ascorbic Acid</td> <td>T - TSP Dodecalhydrate</td> </tr> <tr> <td>I - Ice</td> <td>U - Acetone</td> </tr> <tr> <td>J - DI Water</td> <td>V - MCAA</td> </tr> <tr> <td>K - EDTA</td> <td>W - pH 4.5</td> </tr> <tr> <td>L - EDTA</td> <td>Z - other (Specify)</td> </tr> <tr> <td colspan="2">Other:</td> </tr> </table>		A - HCL	M - Hexate	B - NaOH	N - None	C - Zn Acetate	Q - AsNaO2	D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2O3	G - Amchlor	S - H2SO4	H - Ascorbic Acid	T - TSP Dodecalhydrate	I - Ice	U - Acetone	J - DI Water	V - MCAA	K - EDTA	W - pH 4.5	L - EDTA	Z - other (Specify)	Other:	
A - HCL	M - Hexate																														
B - NaOH	N - None																														
C - Zn Acetate	Q - AsNaO2																														
D - Nitric Acid	P - Na2O4S																														
E - NaHSO4	Q - Na2SO3																														
F - MeOH	R - Na2S2O3																														
G - Amchlor	S - H2SO4																														
H - Ascorbic Acid	T - TSP Dodecalhydrate																														
I - Ice	U - Acetone																														
J - DI Water	V - MCAA																														
K - EDTA	W - pH 4.5																														
L - EDTA	Z - other (Specify)																														
Other:																															
Due Date Requested: 10/17/2018 TAT Requested (days):		Analysis Requested		Total Number of Containers																											
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Project #: 28014371 Site: Xcel Energy CCR - Cherokee Station		Field Filtered Sample (Yes or No) ☒ Yes Potomac MS/MSD (Yes or No) ☒ Yes Ra226Ra228 GPC (MOD) Local Method ☒ Yes 9315 Ra226PreSep 21 Radium-226 - 1/3 - SUB ☒ Yes 9320 Ra226PreSep 0 Radium-226 - 2/3 - SUB ☒ Yes		Special Instructions/Note:																											
Sample Identification - Client ID (Lab ID)		Sample Date		Sample Time																											
MW-14 (280-114648-1)		9/20/18		16:25 Mountain																											
MW-15 (280-114648-2)		9/20/18		14:45 Mountain																											
MW-16 (280-114648-3)		9/20/18		13:15 Mountain																											
MW-17 (280-114648-4)		9/20/18		11:40 Mountain																											
MW-17-DUP (280-114648-5)		9/20/18		11:50 Mountain																											
MW-15-EB (280-114648-6)		9/20/18		15:15 Mountain																											
Possible Hazard Identification		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:		Method of Shipment:																											
Relinquished by: Darlene Bandy		Date: 9/24-18 1330		Company: TestAmerica																											
Relinquished by:		Date:		Company:																											
Relinquished by:		Date:		Company:																											
Custody Seal(s) Intact: Yes		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:																											

TestAmerica Denver

4955 Yarrow Street
Arvada, CO 80002

Phone (303) 736-0100 Fax (303) 431-7171

3.6/4.5

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Lab PM: Bandy, Darlene F		COC No: 280-455697-1							
Client Contact: Shipping/Receiving		E-Mail: darlene.bandy@testamericainc.com		Page: 1 of 1							
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-114648-1							
Address: 4101 Shuffel Street NW, North Canton, OH, 44720		Due Date Requested: 10/15/2018		Analysis Requested							
Phone: 330-497-9396(Tel) 330-497-0772(Fax)		TAT Requested (days):		Preservation Codes:							
Email:		PO #:		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 Other:							
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		Project #: 28014371		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
Site: Xcel Energy CCR - Cherokee Station		SSOW#:		Total Number of Containers							
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=soil, BT=tissue, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 12 Total Metals (w/collision cell)	6010C/3005A Boron	7470A/470A Prep Mercury	6020A/3005A (MOD) 13 Metals	Special Instructions/Note:
MW-14 (280-114648-1)	9/20/18	16:25 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
MW-15 (280-114648-2)	9/20/18	14:45 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
MW-16 (280-114648-3)	9/20/18	13:15 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
MW-17 (280-114648-4)	9/20/18	11:40 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
MW-17-DUP (280-114648-5)	9/20/18	11:50 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
MW-15-EB (280-114648-6)	9/20/18	15:15 Mountain		Water	X	X	X	X	X	X	Use Collision Cell
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/test/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 Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4											
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: <i>WMS</i> Date: 9-28-2018 1610 Time: 16:10 Relinquished by: <i>WMS</i> Date: 9-28-2018 1610 Time: 16:10 Relinquished by: <i>WMS</i> Date: 9-28-2018 1610 Time: 16:10 Relinquished by: <i>WMS</i> Date: 9-28-2018 1610 Time: 16:10 Custody Seal No.: <i>WMS</i> Date: 9-28-2018 1610 Time: 16:10 Cooler Temperature(s) °C and Other Remarks:											

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-114648-1

Login Number: 114648

List Source: TestAmerica Denver

List Number: 1

Creator: Quint, Jessica A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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?	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-114648-1

Login Number: 114648

List Number: 3

Creator: Dupart, Lacey S

List Source: TestAmerica St. Louis

List Creation: 09/25/18 04:27 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	2.5
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 $<6\text{mm}$ (1/4").	True	
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: 280-114648-1

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)	
280-114648-1	MW-14	107	
280-114648-2	MW-15	110	
280-114648-3	MW-16	108	
280-114648-4	MW-17	108	
280-114648-5	MW-17-DUP	110	
280-114648-6	MW-15-EB	109	
LCS 160-391495/1-A	Lab Control Sample	109	
LCSD 160-391495/2-A	Lab Control Sample Dup	106	
MB 160-391495/22-A	Method Blank	110	
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)
280-114648-1	MW-14	107	86.4
280-114648-2	MW-15	110	88.2
280-114648-3	MW-16	108	90.1
280-114648-4	MW-17	108	89.7
280-114648-5	MW-17-DUP	110	82.6
280-114648-6	MW-15-EB	109	83.7
LCS 160-391517/1-A	Lab Control Sample	109	87.1
LCSD 160-391517/2-A	Lab Control Sample Dup	106	85.6
MB 160-391517/22-A	Method Blank	110	83.0
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: 280-115343-1

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

For:

HDR Inc

1670 Broadway, Suite 3400

Denver, Colorado 80202

Attn: Molly Reeves

Elizabeth M. Hoerchler

Authorized for release by:

11/13/2018 8:57:31 PM

Elizabeth Hoerchler, Project Manager I

elizabeth.hoerchler@testamericainc.com

Designee for

Darlene Bandy, Project Manager I

(303)736-0188

darlene.bandy@testamericainc.com

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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.

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Definitions/Glossary

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

TestAmerica Job ID: 280-115343-1

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.
E	Result exceeded calibration range.
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.

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.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-115343-1

Job ID: 280-115343-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-115343-1

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 10/10/2018; the samples arrived in good condition, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.6° C.

Receipt Exceptions

The chain of custody, as received, does not list pH, Boron, Calcium or TDS as analyses requested. Per the original bottle request received 10/5/18, and the client provided Chain of Custody, these analyses have been logged.

TOTAL RECOVERABLE METALS

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/15/2018 and analyzed on 10/18/2018.

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 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 10/15/2018 and analyzed on 10/17/2018 and 10/18/2018.

Calcium and Selenium failed the recovery criteria low for the MS of sample 240-102784-2 in batch 240-350462.

Calcium and Selenium failed the recovery criteria low for the MSD of sample 240-102784-2 in batch 240-350462.

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

TOTAL MERCURY

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 10/15/2018 and analyzed on 10/16/2018.

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

Case Narrative

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

TestAmerica Job ID: 280-115343-1

Job ID: 280-115343-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

TOTAL DISSOLVED SOLIDS

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 10/13/2018.

Total Dissolved Solids (TDS) was detected in method blank MB 280-433306/1 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 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 10/16/2018.

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

CORROSIVITY (PH)

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 10/13/2018 and 10/17/2018.

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

ANIONS (28 DAYS)

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 10/27/2018 and 10/29/2018.

Sulfate was detected in method blank MB 280-435382/6 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 matrix spike / matrix spike duplicate (MS/MSD) recoveries for sulfate in analytical batch 280-435201 were outside control limits. Sample matrix interference is suspected, because the associated laboratory control sample (LCS) recovery was within acceptance limits.

The sample duplicate (DUP) precision for Fluoride in anion analytical batch 280-435382 was outside control limits. Sample non-homogeneity is suspected.

The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

Samples MW-14 (280-115343-1)[5X], MW-15 (280-115343-2)[10X], MW-16 (280-115343-3)[5X], MW-17 (280-115343-4)[5X] and MW-16D (280-115343-5)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 10/15/2018 and analyzed on 11/06/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples in batch 160-395167: MW-14

Case Narrative

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

TestAmerica Job ID: 280-115343-1

Job ID: 280-115343-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

(280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

The following sample in batch 160-395167 was prepared at a reduced aliquot due to potential matrix interference: MW-14 (280-115343-1). The sample was yellow, murky, and contained sediment.

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

RADIUM-228

Samples MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 10/15/2018 and analyzed on 10/31/2018.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples in batch 160-395282: MW-14 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

The following sample in batch 160-395282 was prepared at a reduced aliquot due to potential matrix interference: MW-14 (280-115343-1). Sample was yellow, murky, and contained sediment.

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 (280-115343-1), MW-15 (280-115343-2), MW-16 (280-115343-3), MW-17 (280-115343-4), MW-16D (280-115343-5) and MW-15EB (280-115343-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 11/08/2018.

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

Method Summary

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

TestAmerica Job ID: 280-115343-1

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: 280-115343-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-115343-1	MW-14	Water	10/10/18 11:35	10/10/18 14:00
280-115343-2	MW-15	Water	10/10/18 10:20	10/10/18 14:00
280-115343-3	MW-16	Water	10/09/18 09:30	10/10/18 14:00
280-115343-4	MW-17	Water	10/09/18 15:45	10/10/18 14:00
280-115343-5	MW-16D	Water	10/09/18 09:35	10/10/18 14:00
280-115343-6	MW-15EB	Water	10/10/18 09:00	10/10/18 14:00

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.6		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 00:53	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3.8		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 00:58	1

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.85		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 01:02	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.2		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 01:06	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.84		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 01:11	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L	-	10/15/18 14:00	10/18/18 01:15	1

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

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Arsenic	0.0031	J	0.0050	0.00075	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Barium	0.26		0.0050	0.0022	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Beryllium	0.00097	J	0.0010	0.00031	mg/L	-	10/15/18 14:00	10/18/18 18:19	1
Cadmium	0.00032	J	0.0010	0.00021	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Calcium	210		1.0	0.58	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Chromium	0.034		0.0020	0.00098	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Cobalt	0.011		0.0010	0.00019	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Lead	0.014		0.0010	0.00045	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Lithium	0.071		0.0080	0.0017	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Molybdenum	0.031		0.010	0.0011	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Selenium	0.0067		0.0050	0.00089	mg/L	-	10/15/18 14:00	10/17/18 01:19	1
Thallium	0.00027	J	0.0010	0.00020	mg/L	-	10/15/18 14:00	10/17/18 01:19	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		10/15/18 14:00	10/17/18 01:24	1
Arsenic	0.0031	J	0.0050	0.00075	mg/L		10/15/18 14:00	10/17/18 01:24	1
Barium	0.091		0.0050	0.0022	mg/L		10/15/18 14:00	10/17/18 01:24	1
Beryllium	ND		0.0010	0.00031	mg/L		10/15/18 14:00	10/18/18 18:25	1
Cadmium	ND		0.0010	0.00021	mg/L		10/15/18 14:00	10/17/18 01:24	1
Calcium	270		1.0	0.58	mg/L		10/15/18 14:00	10/17/18 01:24	1
Chromium	0.0010	J	0.0020	0.00098	mg/L		10/15/18 14:00	10/17/18 01:24	1
Cobalt	0.0059		0.0010	0.00019	mg/L		10/15/18 14:00	10/17/18 01:24	1
Lead	ND		0.0010	0.00045	mg/L		10/15/18 14:00	10/17/18 01:24	1
Lithium	0.076		0.0080	0.0017	mg/L		10/15/18 14:00	10/17/18 01:24	1
Molybdenum	0.071		0.010	0.0011	mg/L		10/15/18 14:00	10/17/18 01:24	1
Selenium	0.0072		0.0050	0.00089	mg/L		10/15/18 14:00	10/17/18 01:24	1
Thallium	ND		0.0010	0.00020	mg/L		10/15/18 14:00	10/17/18 01:24	1

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00080	J	0.0020	0.00057	mg/L		10/15/18 14:00	10/17/18 01:29	1
Arsenic	0.0036	J	0.0050	0.00075	mg/L		10/15/18 14:00	10/17/18 01:29	1
Barium	0.046		0.0050	0.0022	mg/L		10/15/18 14:00	10/17/18 01:29	1
Beryllium	ND		0.0010	0.00031	mg/L		10/15/18 14:00	10/18/18 18:28	1
Cadmium	0.00025	J	0.0010	0.00021	mg/L		10/15/18 14:00	10/17/18 01:29	1
Calcium	230		1.0	0.58	mg/L		10/15/18 14:00	10/17/18 01:29	1
Chromium	ND		0.0020	0.00098	mg/L		10/15/18 14:00	10/17/18 01:29	1
Cobalt	0.00089	J	0.0010	0.00019	mg/L		10/15/18 14:00	10/17/18 01:29	1
Lead	ND		0.0010	0.00045	mg/L		10/15/18 14:00	10/17/18 01:29	1
Lithium	0.081		0.0080	0.0017	mg/L		10/15/18 14:00	10/17/18 01:29	1
Molybdenum	0.029		0.010	0.0011	mg/L		10/15/18 14:00	10/17/18 01:29	1
Selenium	0.0084		0.0050	0.00089	mg/L		10/15/18 14:00	10/17/18 01:29	1
Thallium	ND		0.0010	0.00020	mg/L		10/15/18 14:00	10/17/18 01:29	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/15/18 14:00	10/17/18 01:33	1
Arsenic	0.0050		0.0050	0.00075	mg/L		10/15/18 14:00	10/17/18 01:33	1
Barium	0.056		0.0050	0.0022	mg/L		10/15/18 14:00	10/17/18 01:33	1
Beryllium	ND		0.0010	0.00031	mg/L		10/15/18 14:00	10/18/18 18:30	1
Cadmium	0.00086	J	0.0010	0.00021	mg/L		10/15/18 14:00	10/17/18 01:33	1
Calcium	210		1.0	0.58	mg/L		10/15/18 14:00	10/17/18 01:33	1
Chromium	0.0013	J	0.0020	0.00098	mg/L		10/15/18 14:00	10/17/18 01:33	1
Cobalt	0.00065	J	0.0010	0.00019	mg/L		10/15/18 14:00	10/17/18 01:33	1
Lead	ND		0.0010	0.00045	mg/L		10/15/18 14:00	10/17/18 01:33	1
Lithium	0.050		0.0080	0.0017	mg/L		10/15/18 14:00	10/17/18 01:33	1
Molybdenum	0.019		0.010	0.0011	mg/L		10/15/18 14:00	10/17/18 01:33	1
Selenium	0.0080		0.0050	0.00089	mg/L		10/15/18 14:00	10/17/18 01:33	1
Thallium	ND		0.0010	0.00020	mg/L		10/15/18 14:00	10/17/18 01:33	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00078	J	0.0020	0.00057	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Arsenic	0.0041	J	0.0050	0.00075	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Barium	0.042		0.0050	0.0022	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Beryllium	ND		0.0010	0.00031	mg/L	—	10/15/18 14:00	10/18/18 18:32	1
Cadmium	0.00022	J	0.0010	0.00021	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Calcium	220		1.0	0.58	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Chromium	ND		0.0020	0.00098	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Cobalt	0.00078	J	0.0010	0.00019	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Lead	ND		0.0010	0.00045	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Lithium	0.081		0.0080	0.0017	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Molybdenum	0.028		0.010	0.0011	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Selenium	0.0078		0.0050	0.00089	mg/L	—	10/15/18 14:00	10/17/18 01:38	1
Thallium	ND		0.0010	0.00020	mg/L	—	10/15/18 14:00	10/17/18 01:38	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Arsenic	ND		0.0050	0.00075	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Barium	ND		0.0050	0.0022	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Beryllium	ND		0.0010	0.00031	mg/L	—	10/15/18 14:00	10/18/18 18:34	1
Cadmium	ND		0.0010	0.00021	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Calcium	ND		1.0	0.58	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Chromium	ND		0.0020	0.00098	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Cobalt	ND		0.0010	0.00019	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Lead	ND		0.0010	0.00045	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Lithium	ND		0.0080	0.0017	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Molybdenum	ND		0.010	0.0011	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Selenium	ND		0.0050	0.00089	mg/L	—	10/15/18 14:00	10/17/18 01:43	1
Thallium	ND		0.0010	0.00020	mg/L	—	10/15/18 14:00	10/17/18 01:43	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	—	10/15/18 12:00	10/16/18 15:57	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	—	10/15/18 12:00	10/16/18 15:59	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/15/18 12:00	10/16/18 16:01	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/15/18 12:00	10/16/18 16:03	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/15/18 12:00	10/16/18 16:05	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/15/18 12:00	10/16/18 16:12	1

General Chemistry

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/13/18 18:31	1
Temperature	21.1	HF	1.0	1.0	Degrees C			10/13/18 18:31	1
Chloride	340		15	1.3	mg/L			10/29/18 20:01	5
Fluoride	2.3		0.50	0.060	mg/L			10/27/18 15:16	1
Sulfate	380	B	25	1.2	mg/L			10/29/18 20:01	5
Total Dissolved Solids (TDS)	1500	B	20	9.4	mg/L			10/13/18 14:12	1
Total Suspended Solids	53		4.0	1.1	mg/L			10/16/18 13:05	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
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			10/13/18 18:35	1
Temperature	20.7	HF	1.0	1.0	Degrees C			10/13/18 18:35	1
Chloride	360		30	2.5	mg/L			10/29/18 20:20	10
Fluoride	2.0		0.50	0.060	mg/L			10/27/18 15:35	1
Sulfate	1000	B	50	2.3	mg/L			10/29/18 20:20	10
Total Dissolved Solids (TDS)	2100	B	20	9.4	mg/L			10/13/18 14:12	1
Total Suspended Solids	2.8	J	4.0	1.1	mg/L			10/16/18 13:05	1

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/13/18 18:41	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

General Chemistry (Continued)

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	21.1	HF	1.0	1.0	Degrees C			10/13/18 18:41	1
Chloride	380		15	1.3	mg/L			10/29/18 20:38	5
Fluoride	2.6		0.50	0.060	mg/L			10/27/18 16:31	1
Sulfate	760	B	25	1.2	mg/L			10/29/18 20:38	5
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L			10/13/18 14:12	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			10/16/18 13:05	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/13/18 18:46	1
Temperature	21.4	HF	1.0	1.0	Degrees C			10/13/18 18:46	1
Chloride	270		15	1.3	mg/L			10/29/18 20:57	5
Fluoride	2.3		0.50	0.060	mg/L			10/27/18 17:46	1
Sulfate	560	B	25	1.2	mg/L			10/29/18 20:57	5
Total Dissolved Solids (TDS)	1500	B	20	9.4	mg/L			10/13/18 14:12	1
Total Suspended Solids	11		4.0	1.1	mg/L			10/16/18 13:05	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU			10/13/18 19:05	1
Temperature	21.0	HF	1.0	1.0	Degrees C			10/13/18 19:05	1
Chloride	390		15	1.3	mg/L			10/29/18 21:16	5
Fluoride	2.6		0.50	0.060	mg/L			10/27/18 18:05	1
Sulfate	760	B	25	1.2	mg/L			10/29/18 21:16	5
Total Dissolved Solids (TDS)	1900	B	20	9.4	mg/L			10/13/18 14:12	1
Total Suspended Solids	ND		4.0	1.1	mg/L			10/16/18 13:05	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.3	HF	0.1	0.1	SU			10/17/18 14:26	1
Temperature	20.3	HF	1.0	1.0	Degrees C			10/17/18 14:26	1
Chloride	ND		3.0	0.25	mg/L			10/27/18 18:23	1
Fluoride	ND		0.50	0.060	mg/L			10/27/18 18:23	1
Sulfate	ND		5.0	0.23	mg/L			10/27/18 18:23	1
Total Dissolved Solids (TDS)	12	B	10	4.7	mg/L			10/13/18 14:12	1
Total Suspended Solids	ND		4.0	1.1	mg/L			10/16/18 13:05	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.344		0.138	0.141	1.00	0.137	pCi/L	10/15/18 09:41	11/06/18 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					10/15/18 09:41	11/06/18 14:21	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.409		0.119	0.125	1.00	0.0947	pCi/L	10/15/18 09:41	11/06/18 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					10/15/18 09:41	11/06/18 14:21	1

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.351		0.116	0.120	1.00	0.106	pCi/L	10/15/18 09:41	11/06/18 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/15/18 09:41	11/06/18 14:21	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.339		0.114	0.118	1.00	0.100	pCi/L	10/15/18 09:41	11/06/18 14:21	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					10/15/18 09:41	11/06/18 14:21	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.356		0.121	0.125	1.00	0.111	pCi/L	10/15/18 09:41	11/06/18 14:16	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/15/18 09:41	11/06/18 14:16	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.128		0.0824	0.0832	1.00	0.109	pCi/L	10/15/18 09:41	11/06/18 14:16	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110					10/15/18 09:41	11/06/18 14:16	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.795		0.354	0.362	1.00	0.501	pCi/L	10/15/18 13:37	10/31/18 10:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					10/15/18 13:37	10/31/18 10:12	1
Y Carrier	78.9		40 - 110					10/15/18 13:37	10/31/18 10:12	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.884		0.284	0.296	1.00	0.370	pCi/L	10/15/18 13:37	10/31/18 10:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					10/15/18 13:37	10/31/18 10:12	1
Y Carrier	76.6		40 - 110					10/15/18 13:37	10/31/18 10:12	1

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.507		0.245	0.249	1.00	0.349	pCi/L	10/15/18 13:37	10/31/18 10:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/15/18 13:37	10/31/18 10:12	1
Y Carrier	80.0		40 - 110					10/15/18 13:37	10/31/18 10:12	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.628		0.254	0.260	1.00	0.350	pCi/L	10/15/18 13:37	10/31/18 10:12	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					10/15/18 13:37	10/31/18 10:12	1
Y Carrier	80.7		40 - 110					10/15/18 13:37	10/31/18 10:12	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.289	U	0.256	0.258	1.00	0.412	pCi/L	10/15/18 13:37	10/31/18 10:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					10/15/18 13:37	10/31/18 10:13	1
Y Carrier	80.0		40 - 110					10/15/18 13:37	10/31/18 10:13	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.425		0.231	0.235	1.00	0.346	pCi/L	10/15/18 13:37	10/31/18 10:13	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	109		40 - 110					10/15/18 13:37	10/31/18 10:13	1
Y Carrier	83.0		40 - 110					10/15/18 13:37	10/31/18 10:13	1

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

Client Sample ID: MW-14
Date Collected: 10/10/18 11:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.14		0.380	0.388	5.00	0.501	pCi/L		11/08/18 16:41	1

Client Sample ID: MW-15
Date Collected: 10/10/18 10:20
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.29		0.308	0.321	5.00	0.370	pCi/L		11/08/18 16:41	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Client Sample ID: MW-16
Date Collected: 10/09/18 09:30
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.858		0.271	0.276	5.00	0.349	pCi/L		11/08/18 16:41	1

Client Sample ID: MW-17
Date Collected: 10/09/18 15:45
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.968		0.278	0.286	5.00	0.350	pCi/L		11/08/18 16:41	1

Client Sample ID: MW-16D
Date Collected: 10/09/18 09:35
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.645		0.283	0.287	5.00	0.412	pCi/L		11/08/18 16:41	1

Client Sample ID: MW-15EB
Date Collected: 10/10/18 09:00
Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.554		0.245	0.249	5.00	0.346	pCi/L		11/08/18 16:41	1

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-350084/1-A
Matrix: Water
Analysis Batch: 350595

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.10	0.023	mg/L		10/15/18 14:00	10/17/18 23:14	1

Lab Sample ID: LCS 240-350084/2-A
Matrix: Water
Analysis Batch: 350595

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.10		mg/L		110	80 - 120

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-350084/1-A
Matrix: Water
Analysis Batch: 350462

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		10/15/18 14:00	10/16/18 23:34	1
Arsenic	ND		0.0050	0.00075	mg/L		10/15/18 14:00	10/16/18 23:34	1
Barium	ND		0.0050	0.0022	mg/L		10/15/18 14:00	10/16/18 23:34	1
Cadmium	ND		0.0010	0.00021	mg/L		10/15/18 14:00	10/16/18 23:34	1
Calcium	ND		1.0	0.58	mg/L		10/15/18 14:00	10/16/18 23:34	1
Chromium	ND		0.0020	0.00098	mg/L		10/15/18 14:00	10/16/18 23:34	1
Cobalt	ND		0.0010	0.00019	mg/L		10/15/18 14:00	10/16/18 23:34	1
Lead	ND		0.0010	0.00045	mg/L		10/15/18 14:00	10/16/18 23:34	1
Molybdenum	ND		0.010	0.0011	mg/L		10/15/18 14:00	10/16/18 23:34	1
Selenium	ND		0.0050	0.00089	mg/L		10/15/18 14:00	10/16/18 23:34	1
Thallium	ND		0.0010	0.00020	mg/L		10/15/18 14:00	10/16/18 23:34	1

Lab Sample ID: MB 240-350084/1-A
Matrix: Water
Analysis Batch: 350851

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010	0.00031	mg/L		10/15/18 14:00	10/18/18 17:34	1

Lab Sample ID: LCS 240-350084/3-A
Matrix: Water
Analysis Batch: 350462

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0970		mg/L		97	80 - 120
Arsenic	1.00	1.01		mg/L		101	80 - 120
Barium	1.00	0.923		mg/L		92	80 - 120
Cadmium	1.00	1.02		mg/L		102	80 - 120
Calcium	10.0	10.5		mg/L		105	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	1.02		mg/L		102	80 - 120
Lead	1.00	0.946		mg/L		95	80 - 120
Molybdenum	0.100	0.0968		mg/L		97	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Lab Sample ID: LCS 240-350084/3-A
Matrix: Water
Analysis Batch: 350462

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Selenium	1.00	1.01		mg/L		101	80 - 120
Thallium	0.250	0.240		mg/L		96	80 - 120

Lab Sample ID: LCS 240-350084/3-A
Matrix: Water
Analysis Batch: 350851

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 350084

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	1.00	0.951		mg/L		95	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-350085/1-A
Matrix: Water
Analysis Batch: 350504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 350085

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		10/15/18 12:00	10/16/18 15:13	1

Lab Sample ID: LCS 240-350085/2-A
Matrix: Water
Analysis Batch: 350504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 350085

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.99		ug/L		100	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-433427/31
Matrix: Water
Analysis Batch: 433427

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: LCS 280-433427/57
Matrix: Water
Analysis Batch: 433427

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: 280-115343-5 DU
Matrix: Water
Analysis Batch: 433427

Client Sample ID: MW-16D
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH adj. to 25 deg C	7.6	HF	7.6		SU		0.4	5
Temperature	21.0	HF	21.1		Degrees C		0.4	10

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

Method: 9040B - pH (Continued)

Lab Sample ID: LCS 280-433929/4

Matrix: Water

Analysis Batch: 433929

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 280-435201/6

Matrix: Water

Analysis Batch: 435201

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	0.25	mg/L			10/27/18 11:51	1
Fluoride	ND		0.50	0.060	mg/L			10/27/18 11:51	1
Sulfate	ND		5.0	0.23	mg/L			10/27/18 11:51	1

Lab Sample ID: LCS 280-435201/4

Matrix: Water

Analysis Batch: 435201

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	100		mg/L		100	90 - 110
Fluoride	5.00	5.04		mg/L		101	90 - 110
Sulfate	100	102		mg/L		102	90 - 110

Lab Sample ID: LCSD 280-435201/5

Matrix: Water

Analysis Batch: 435201

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	100		mg/L		100	90 - 110	0	10
Fluoride	5.00	5.06		mg/L		101	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

Lab Sample ID: MRL 280-435201/3

Matrix: Water

Analysis Batch: 435201

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.61	J	mg/L		105	50 - 150
Fluoride	0.200	0.194	J	mg/L		97	50 - 150
Sulfate	2.50	2.71	J	mg/L		108	50 - 150

Lab Sample ID: 280-115343-3 MS

Matrix: Water

Analysis Batch: 435201

Client Sample ID: MW-16

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	360	E	25.0	385	E 4	mg/L		98	80 - 120
Fluoride	2.6		5.00	7.55		mg/L		99	80 - 120
Sulfate	750	E	25.0	772	E 4	mg/L		74	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Lab Sample ID: 280-115343-3 MSD

Matrix: Water

Analysis Batch: 435201

Client Sample ID: MW-16

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chloride	360	E	25.0	385	E 4	mg/L		98	80 - 120	0	20
Fluoride	2.6		5.00	7.59		mg/L		100	80 - 120	1	20
Sulfate	750	E	25.0	773	E 4	mg/L		77	80 - 120	0	20

Lab Sample ID: 280-115343-3 DU

Matrix: Water

Analysis Batch: 435201

Client Sample ID: MW-16

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	360	E	361	E	mg/L		0.07	15
Fluoride	2.6		2.61		mg/L		0.6	15
Sulfate	750	E	754	E	mg/L		0.07	15

Lab Sample ID: MB 280-435382/6

Matrix: Water

Analysis Batch: 435382

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	0.25	mg/L			10/29/18 17:06	1
Fluoride	ND		0.50	0.060	mg/L			10/29/18 17:06	1
Sulfate	0.251	J	5.0	0.23	mg/L			10/29/18 17:06	1

Lab Sample ID: LCS 280-435382/4

Matrix: Water

Analysis Batch: 435382

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	101		mg/L		101	90 - 110
Fluoride	5.00	4.97		mg/L		99	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

Lab Sample ID: LCSD 280-435382/5

Matrix: Water

Analysis Batch: 435382

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	101		mg/L		101	90 - 110	0	10
Fluoride	5.00	4.99		mg/L		100	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-435382/3

Matrix: Water

Analysis Batch: 435382

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.72	J	mg/L		109	50 - 150
Fluoride	0.200	0.177	J	mg/L		89	50 - 150
Sulfate	2.50	2.72	J	mg/L		109	50 - 150

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Lab Sample ID: MB 280-433306/1
Matrix: Water
Analysis Batch: 433306

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)	6.00	J	10	4.7	mg/L	-		10/13/18 14:12	1

Lab Sample ID: LCS 280-433306/2
Matrix: Water
Analysis Batch: 433306

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	500	494		mg/L	-	99	86 - 110

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

Lab Sample ID: MB 280-433624/1
Matrix: Water
Analysis Batch: 433624

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L	-		10/16/18 13:05	1

Lab Sample ID: LCS 280-433624/2
Matrix: Water
Analysis Batch: 433624

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	105		mg/L	-	105	86 - 114

Lab Sample ID: 280-115343-1 DU
Matrix: Water
Analysis Batch: 433624

Client Sample ID: MW-14
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	53		58.4		mg/L	-	10	10

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-395167/19-A
Matrix: Water
Analysis Batch: 399568

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 395167

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1291		0.0866	0.0874	1.00	0.118	pCi/L	10/15/18 09:41	11/06/18 14:17	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	107		40 - 110					10/15/18 09:41	11/06/18 14:17	1

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Lab Sample ID: LCS 160-395167/1-A

Matrix: Water

Analysis Batch: 399569

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395167

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.29		1.20	1.00	0.0805	pCi/L	99	68 - 137
Carrier	%Yield	LCS Qualifier	Limits						
Ba Carrier	88.2		40 - 110						

Lab Sample ID: LCSD 160-395167/2-A

Matrix: Water

Analysis Batch: 399569

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 395167

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.4	11.02		1.16	1.00	0.110	pCi/L	97	68 - 137	0.12	1
Carrier	%Yield	LCSD Qualifier	Limits								
Ba Carrier	98.2		40 - 110								

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-395282/19-A

Matrix: Water

Analysis Batch: 398413

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 395282

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.008077	U	0.173	0.173	1.00	0.313	pCi/L	10/15/18 13:37	10/31/18 10:13	1
Carrier	%Yield	MB Qualifier	Limits							
Ba Carrier	107		40 - 110							
Y Carrier	81.5		40 - 110							

Lab Sample ID: LCS 160-395282/1-A

Matrix: Water

Analysis Batch: 398413

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 395282

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	9.26	8.991		1.09	1.00	0.434	pCi/L	97	56 - 140
Carrier	%Yield	LCS Qualifier	Limits						
Ba Carrier	88.2		40 - 110						
Y Carrier	81.1		40 - 110						

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-115343-1

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

Lab Sample ID: LCSD 160-395282/2-A
Matrix: Water
Analysis Batch: 398413

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 395282

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	9.26	8.590		1.05	1.00	0.445	pCi/L	93	56 - 140	0.19	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	98.2		40 - 110
Y Carrier	73.3		40 - 110

QC Association Summary

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

TestAmerica Job ID: 280-115343-1

Metals

Prep Batch: 350084

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total Recoverable	Water	3005A	
280-115343-2	MW-15	Total Recoverable	Water	3005A	
280-115343-3	MW-16	Total Recoverable	Water	3005A	
280-115343-4	MW-17	Total Recoverable	Water	3005A	
280-115343-5	MW-16D	Total Recoverable	Water	3005A	
280-115343-6	MW-15EB	Total Recoverable	Water	3005A	
MB 240-350084/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-350084/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-350084/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 350085

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	7470A	
280-115343-2	MW-15	Total/NA	Water	7470A	
280-115343-3	MW-16	Total/NA	Water	7470A	
280-115343-4	MW-17	Total/NA	Water	7470A	
280-115343-5	MW-16D	Total/NA	Water	7470A	
280-115343-6	MW-15EB	Total/NA	Water	7470A	
MB 240-350085/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-350085/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 350462

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total Recoverable	Water	6020A	350084
280-115343-2	MW-15	Total Recoverable	Water	6020A	350084
280-115343-3	MW-16	Total Recoverable	Water	6020A	350084
280-115343-4	MW-17	Total Recoverable	Water	6020A	350084
280-115343-5	MW-16D	Total Recoverable	Water	6020A	350084
280-115343-6	MW-15EB	Total Recoverable	Water	6020A	350084
MB 240-350084/1-A	Method Blank	Total Recoverable	Water	6020A	350084
LCS 240-350084/3-A	Lab Control Sample	Total Recoverable	Water	6020A	350084

Analysis Batch: 350504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	7470A	350085
280-115343-2	MW-15	Total/NA	Water	7470A	350085
280-115343-3	MW-16	Total/NA	Water	7470A	350085
280-115343-4	MW-17	Total/NA	Water	7470A	350085
280-115343-5	MW-16D	Total/NA	Water	7470A	350085
280-115343-6	MW-15EB	Total/NA	Water	7470A	350085
MB 240-350085/1-A	Method Blank	Total/NA	Water	7470A	350085
LCS 240-350085/2-A	Lab Control Sample	Total/NA	Water	7470A	350085

Analysis Batch: 350595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total Recoverable	Water	6010C	350084
280-115343-2	MW-15	Total Recoverable	Water	6010C	350084
280-115343-3	MW-16	Total Recoverable	Water	6010C	350084
280-115343-4	MW-17	Total Recoverable	Water	6010C	350084
280-115343-5	MW-16D	Total Recoverable	Water	6010C	350084
280-115343-6	MW-15EB	Total Recoverable	Water	6010C	350084

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-115343-1

Metals (Continued)

Analysis Batch: 350595 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 240-350084/1-A	Method Blank	Total Recoverable	Water	6010C	350084
LCS 240-350084/2-A	Lab Control Sample	Total Recoverable	Water	6010C	350084

Analysis Batch: 350851

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total Recoverable	Water	6020A	350084
280-115343-2	MW-15	Total Recoverable	Water	6020A	350084
280-115343-3	MW-16	Total Recoverable	Water	6020A	350084
280-115343-4	MW-17	Total Recoverable	Water	6020A	350084
280-115343-5	MW-16D	Total Recoverable	Water	6020A	350084
280-115343-6	MW-15EB	Total Recoverable	Water	6020A	350084
MB 240-350084/1-A	Method Blank	Total Recoverable	Water	6020A	350084
LCS 240-350084/3-A	Lab Control Sample	Total Recoverable	Water	6020A	350084

General Chemistry

Analysis Batch: 433306

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	SM 2540C	
280-115343-2	MW-15	Total/NA	Water	SM 2540C	
280-115343-3	MW-16	Total/NA	Water	SM 2540C	
280-115343-4	MW-17	Total/NA	Water	SM 2540C	
280-115343-5	MW-16D	Total/NA	Water	SM 2540C	
280-115343-6	MW-15EB	Total/NA	Water	SM 2540C	
MB 280-433306/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-433306/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 433427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	9040B	
280-115343-2	MW-15	Total/NA	Water	9040B	
280-115343-3	MW-16	Total/NA	Water	9040B	
280-115343-4	MW-17	Total/NA	Water	9040B	
280-115343-5	MW-16D	Total/NA	Water	9040B	
LCS 280-433427/31	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-433427/57	Lab Control Sample	Total/NA	Water	9040B	
280-115343-5 DU	MW-16D	Total/NA	Water	9040B	

Analysis Batch: 433624

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	SM 2540D	
280-115343-2	MW-15	Total/NA	Water	SM 2540D	
280-115343-3	MW-16	Total/NA	Water	SM 2540D	
280-115343-4	MW-17	Total/NA	Water	SM 2540D	
280-115343-5	MW-16D	Total/NA	Water	SM 2540D	
280-115343-6	MW-15EB	Total/NA	Water	SM 2540D	
MB 280-433624/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-433624/2	Lab Control Sample	Total/NA	Water	SM 2540D	
280-115343-1 DU	MW-14	Total/NA	Water	SM 2540D	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-115343-1

General Chemistry (Continued)

Analysis Batch: 433929

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-6	MW-15EB	Total/NA	Water	9040B	
LCS 280-433929/4	Lab Control Sample	Total/NA	Water	9040B	

Analysis Batch: 435201

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	9056A	
280-115343-2	MW-15	Total/NA	Water	9056A	
280-115343-3	MW-16	Total/NA	Water	9056A	
280-115343-4	MW-17	Total/NA	Water	9056A	
280-115343-5	MW-16D	Total/NA	Water	9056A	
280-115343-6	MW-15EB	Total/NA	Water	9056A	
MB 280-435201/6	Method Blank	Total/NA	Water	9056A	
LCS 280-435201/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-435201/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-435201/3	Lab Control Sample	Total/NA	Water	9056A	
280-115343-3 MS	MW-16	Total/NA	Water	9056A	
280-115343-3 MSD	MW-16	Total/NA	Water	9056A	
280-115343-3 DU	MW-16	Total/NA	Water	9056A	

Analysis Batch: 435382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	9056A	
280-115343-2	MW-15	Total/NA	Water	9056A	
280-115343-3	MW-16	Total/NA	Water	9056A	
280-115343-4	MW-17	Total/NA	Water	9056A	
280-115343-5	MW-16D	Total/NA	Water	9056A	
MB 280-435382/6	Method Blank	Total/NA	Water	9056A	
LCS 280-435382/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-435382/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-435382/3	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 395167

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	PrecSep-21	
280-115343-2	MW-15	Total/NA	Water	PrecSep-21	
280-115343-3	MW-16	Total/NA	Water	PrecSep-21	
280-115343-4	MW-17	Total/NA	Water	PrecSep-21	
280-115343-5	MW-16D	Total/NA	Water	PrecSep-21	
280-115343-6	MW-15EB	Total/NA	Water	PrecSep-21	
MB 160-395167/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-395167/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-395167/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

Prep Batch: 395282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-1	MW-14	Total/NA	Water	PrecSep_0	
280-115343-2	MW-15	Total/NA	Water	PrecSep_0	
280-115343-3	MW-16	Total/NA	Water	PrecSep_0	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-115343-1

Rad (Continued)

Prep Batch: 395282 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-115343-4	MW-17	Total/NA	Water	PrecSep_0	
280-115343-5	MW-16D	Total/NA	Water	PrecSep_0	
280-115343-6	MW-15EB	Total/NA	Water	PrecSep_0	
MB 160-395282/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-395282/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-395282/2-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: 280-115343-1

Client Sample ID: MW-14

Date Collected: 10/10/18 11:35

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-1

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 00:53	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:19	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:19	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 15:57	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433427	10/13/18 18:31	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 15:16	ARM	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435382	10/29/18 20:01	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			750.03 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399569	11/06/18 14:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.03 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:12	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

Client Sample ID: MW-15

Date Collected: 10/10/18 10:20

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-2

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 00:58	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:24	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:25	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 15:59	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433427	10/13/18 18:35	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 15:35	ARM	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	435382	10/29/18 20:20	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.66 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399569	11/06/18 14:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.66 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:12	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-115343-1

Client Sample ID: MW-16

Date Collected: 10/09/18 09:30

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-3

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 01:02	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:29	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:28	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 16:01	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433427	10/13/18 18:41	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 16:31	ARM	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435382	10/29/18 20:38	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			1000.05 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399569	11/06/18 14:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.05 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:12	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

Client Sample ID: MW-17

Date Collected: 10/09/18 15:45

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-4

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 01:06	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:33	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:30	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 16:03	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433427	10/13/18 18:46	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 17:46	ARM	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435382	10/29/18 20:57	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.93 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399569	11/06/18 14:21	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.93 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:12	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-115343-1

Client Sample ID: MW-16D

Date Collected: 10/09/18 09:35

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-5

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 01:11	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:38	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:32	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 16:05	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433427	10/13/18 19:05	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 18:05	ARM	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	435382	10/29/18 21:16	A1D	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.75 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399568	11/06/18 14:16	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.75 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:13	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

Client Sample ID: MW-15EB

Date Collected: 10/10/18 09:00

Date Received: 10/10/18 14:00

Lab Sample ID: 280-115343-6

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	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6010C		1			350595	10/18/18 01:15	WKD	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350462	10/17/18 01:43	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	350084	10/15/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			350851	10/18/18 18:34	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	350085	10/15/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			350504	10/16/18 16:12	AJC	TAL CAN
Total/NA	Analysis	9040B		1			433929	10/17/18 14:26	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	435201	10/27/18 18:23	ARM	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	433306	10/13/18 14:12	VB	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	433624	10/16/18 13:05	JAP	TAL DEN
Total/NA	Prep	PrecSep-21			999.92 mL	1.0 g	395167	10/15/18 09:41	JLC	TAL SL
Total/NA	Analysis	9315		1			399568	11/06/18 14:16	CDR	TAL SL
Total/NA	Prep	PrecSep_0			999.92 mL	1.0 g	395282	10/15/18 13:37	JLC	TAL SL
Total/NA	Analysis	9320		1			398413	10/31/18 10:13	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			400041	11/08/18 16:41	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-115343-1

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

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Accreditation/Certification Summary

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

TestAmerica Job ID: 280-115343-1

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	01-08-19
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	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
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	T104704517-17-9	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

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 ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
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	11-30-18 *
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-18 *
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18 *
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-115343-1

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

Chain of Custody Record

Client Information Client Contact: Anna Lundin 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: N. Hanrahan Lab PM: Bandy, Darlene F E-Mail: darlene.bandy@testamericainc.com Carrier Tracking No(s): Lab No: 280-80236-25683.1 Page: Page 1 of 1 Job #:	
Due Date Requested: TAT Requested (days): 2 week PO #: DEN-018 WO #: 28014371 Project #: 28014371 SSOW#:		Analysis Requested  280-115343 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 Other:		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecalhydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Sample Identification MW-14 MW-15 MW-16 MW-17 MW-16D MW-15EB		Special Instructions/Note: Total Number of containers: 6 9315_Ra226, 9320_Ra228 2540D - Total Suspended Solids 9056A_28D - Anions 6020A_7470A Perform MS/MSD (Yes or No)	
Field Filtered Sample (Yes or No) D N N D 9056A_28D - Anions 2540D - Total Suspended Solids 9315_Ra226, 9320_Ra228		Sample Type (C=Comp, G=grab) G G G G G G G Matrix (Water, Solid, Other) Water Water Water Water Water Water Water	
Sample Date 10/10/18 10/10/18 10/9/18 10/9/18 10/9/18 10/10/18		Sample Time 1135 1020 0930 1545 0935 0900	
Possible Hazard Identification ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological		Deliverable Requested: I, II, III, IV, Other (specify)	
Empty Kit Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) ☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months	
Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]		Special Instructions/QC Requirements: Method of Shipment:	
Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]		Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]	
Custody Seal No.: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks: 2-9, 0.9 20.9 CF + 2-7 1 Per br 10/10/18	

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)						Carrier Tracking No(s):				
Client Contact:						COC No:				
Shipping/Receiving						280-457872.1				
Company:						Page:				
TestAmerica Laboratories, Inc.						Page 1 of 1				
Address:						Job #:				
13715 Rider Trail North,						280-115343-1				
City:						Preservation Codes:				
Earth City						A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO ₄ F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:				
State, Zip: MO, 63045										
Phone:										
Email:										
Project Name:										
Xcel Energy GW CCR Monitoring - Cherokee										
Site:										
Xcel Energy CCR - Cherokee Station										
Sample Identification - Client ID (Lab ID)						Special Instructions/Note:				
MW-14 (280-115343-1)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastefl, 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 - +13 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Total Number of containers
	10/10/18	11:35 Mountain		Water	X	X	X	X	X	2
MW-15 (280-115343-2)	10/10/18	10:20 Mountain		Water	X	X	X	X	X	2
MW-16 (280-115343-3)	10/9/18	09:30 Mountain		Water	X	X	X	X	X	2
MW-17 (280-115343-4)	10/9/18	15:45 Mountain		Water	X	X	X	X	X	2
MW-16D (280-115343-5)	10/9/18	09:35 Mountain		Water	X	X	X	X	X	2
MW-15EB (280-115343-6)	10/10/18	09:00 Mountain		Water	X	X	X	X	X	2
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/test/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										
Deliverable Requested: I, II, III, IV, Other (specify)										
Primary Deliverable Rank: 4										
Date:										
Empty Kit Relinquished by:										
Relinquished by:										
Relinquished by:										
Relinquished by:										
Custody Seal Intact: Yes No										
Custody Seal No.:										
Cooler Temperature(s) °C and Other Remarks:										

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)				Sampler: Bandy, Darlene F		Carrier Tracking No(s): 280-457872.1	
Client Contact: Shipping/Receiving				Phone: E-Mail:		State of Origin: Colorado	
Company: TestAmerica Laboratories, Inc.				darlene.bandy@testamericainc.com		Page 1 of 1	
Address: 13715 Rider Trail North,				Job #: 280-115343-1		Preservation Codes:	
City: Earth City				PO #:		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Anichlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:	
State, Zip: MO, 63045				WO #:		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)	
Project Name: Xcel Energy GW CCR Monitoring - Cherokee				Project #: 28014371		TAT Requested (days):	
Site: Xcel Energy CCR - Cherokee Station				SSOW#:		Due Date Requested: 11/5/2018	

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=water/oil, BT=Tissue, A=Air)	Analysis Requested				Total Number of containers	Special Instructions/Note:
					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		
MW-14 (280-115343-1)	10/10/18	11:35 Mountain		Water			X	X	2	
MW-15 (280-115343-2)	10/10/18	10:20 Mountain		Water			X	X	2	
MW-16 (280-115343-3)	10/9/18	09:30 Mountain		Water			X	X	2	
MW-17 (280-115343-4)	10/9/18	15:45 Mountain		Water			X	X	2	
MW-16D (280-115343-5)	10/9/18	09:35 Mountain		Water			X	X	2	
MW-15EB (280-115343-6)	10/10/18	09:00 Mountain		Water			X	X	2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/test/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			
Deliverable Requested: I, II, III, IV, Other (specify)			
Primary Deliverable Rank: 4			
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:	
Relinquished by:		Date/Time:	
Relinquished by:		Date/Time:	
Relinquished by:		Date/Time:	
Custody Seals Intact: Δ Yes Δ No		Cooler Temperature(s) °C and Other Remarks:	

10.6/11.5

Chain of Custody Record



Client Information (Sub Contract Lab)		Samplet:	Lab PM:	Carrier Tracking No(s):	COC No:							
Client Contact:		Phone:	Bandy, Darlene F		280-457873-1							
Shipping/Receiving			E-Mail:	State of Origin:	Page:							
Company:			darlene.bandy@testamericainc.com	Colorado	1 of 1							
Address:		Due Date Requested:	Job #:									
4101 Shuffel Street NW,		11/1/2018	280-115343-1									
City:		TAT Requested (days):	Preservation Codes:									
North Canton			A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 O - Na2SO3 F - MeOH R - Na2SO3 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:									
State, Zip:		PO #:										
OH, 44720												
Phone:		WO #:										
330-497-9396(Tel) 330-497-0772(Fax)												
Email:												
Project Name:		Project #:										
Xcel Energy GW CCR Monitoring - Cherokee		28014371										
Site:		SSOW#:										
Xcel Energy CCR - Cherokee Station												
Sample Identification - Client ID (Lab ID)		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=organic, BT=base, A=Al)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A (MOD) 13 Metals	6010C/3005A Boron	7470A/7470A Prep Mercury	Total Number of Containers	Special Instructions/Note:
MW-14 (280-115343-1)		10/10/18	11:35	Mountain	Water		X	X	X		1	Use Collision Cell
MW-15 (280-115343-2)		10/10/18	10:20	Mountain	Water		X	X	X		1	Use Collision Cell
MW-16 (280-115343-3)		10/9/18	09:30	Mountain	Water		X	X	X		1	Use Collision Cell
MW-17 (280-115343-4)		10/9/18	15:45	Mountain	Water		X	X	X		1	Use Collision Cell
MW-16D (280-115343-5)		10/9/18	09:35	Mountain	Water		X	X	X		1	Use Collision Cell
MW-15EB (280-115343-6)		10/10/18	09:00	Mountain	Water		X	X	X		1	Use Collision Cell
Note: Since laboratory accreditation is subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon our 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/test/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 Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4 Empty Kit Relinquished by: Relinquished by: <i>Way</i> Relinquished by: <i>Way</i> Relinquished by: Custody Seals Intact: ☐ Yes ☒ No Custody Seal No.:												
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/OC Requirements: Method of Shipment: Date: <i>10-1-10</i> <i>1752</i> Received by: <i>Way</i> Company: <i>Way</i> Date/Time: <i>10/1/18 930</i> Company: <i>Way</i> Date/Time: Company: Date/Time: Company: Cooler Temperature(s) °C and Other Remarks:												

TestAmerica Canton Sample Receipt Form/Narrative				Login # : _____
Canton Facility				
Client <u>TA Denver</u>		Site Name _____		Cooler unpacked by: <u>SSC</u>
Cooler Received on <u>10/12/18</u>		Opened on <u>10/12/18</u>		
FedEx: 1 st Grd ☒ Exp ☐ UPS ☐ FAS ☐ Clipper ☐ Client Drop Off ☐ TestAmerica Courier ☐ Other ☐				
Receipt After-hours: Drop-off Date/Time _____			Storage Location _____	
TestAmerica Cooler # <u>TA</u>	Foam Box ☐	Client Cooler ☐	Box ☐	Other ☐
Packing material used: <u>Bubble Wrap</u> ☐ Foam ☐ <u>Plastic Bag</u> ☐ None ☐ Other ☐				
COOLANT: <u>Wet Ice</u> ☐ Blue Ice ☐ Dry Ice ☐ Water ☐ None ☐				
1. Cooler temperature upon receipt ☐ See Multiple Cooler Form				
IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. <u>10.6</u> °C Corrected Cooler Temp. <u>11.5</u> °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 <u>1</u>				
				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)?				
4. Did custody papers accompany the sample(s)?				
5. Were the custody papers relinquished & signed in the appropriate place?				
6. Was/were the person(s) who collected the samples clearly identified on the COC?				
7. Did all bottles arrive in good condition (Unbroken)?				
8. Could all bottle labels be reconciled with the COC?				
9. Were correct bottle(s) used for the test(s) indicated?				
10. Sufficient quantity received to perform indicated analyses?				
11. Are these work share samples?				
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
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
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____				
Concerning _____				

Tests that are not checked for pH by Receiving:

VOAs
Oil and Grease
TOC

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): _____	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-115343-1

Login Number: 115343

List Number: 1

Creator: Lujan, Jacob P

List Source: TestAmerica Denver

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-115343-1

Login Number: 115343

List Number: 2

Creator: Dupart, Lacey S

List Source: TestAmerica St. Louis

List Creation: 10/12/18 12:44 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	2.9
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 $<6\text{mm}$ (1/4").	True	
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: 280-115343-1

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)
280-115343-1	MW-14	95.3
280-115343-2	MW-15	103
280-115343-3	MW-16	100
280-115343-4	MW-17	101
280-115343-5	MW-16D	100
280-115343-6	MW-15EB	109
LCS 160-395167/1-A	Lab Control Sample	88.2
LCSD 160-395167/2-A	Lab Control Sample Dup	98.2
MB 160-395167/19-A	Method Blank	107

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)
280-115343-1	MW-14	95.3	78.9
280-115343-2	MW-15	103	76.6
280-115343-3	MW-16	100	80.0
280-115343-4	MW-17	101	80.7
280-115343-5	MW-16D	100	80.0
280-115343-6	MW-15EB	109	83.0
LCS 160-395282/1-A	Lab Control Sample	88.2	81.1
LCSD 160-395282/2-A	Lab Control Sample Dup	98.2	73.3
MB 160-395282/19-A	Method Blank	107	81.5

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: 280-116234-1

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:

11/29/2018 10:48:04 AM

Darlene Bandy, Project Manager I

(303)736-0188

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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.

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Definitions/Glossary

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

TestAmerica Job ID: 280-116234-1

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.
B	Compound was found in the blank and sample.

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.
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.
α	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)

Case Narrative

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

TestAmerica Job ID: 280-116234-1

Job ID: 280-116234-1

Laboratory: TestAmerica Denver

Narrative

CASE NARRATIVE

Client: HDR Inc

Project: Xcel Energy GW CCR Monitoring - Cherokee

Report Number: 280-116234-1

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 10/26/2018 12:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.0° C and 2.3° C.

TOTAL RECOVERABLE METALS

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/30/2018 and analyzed on 10/31/2018.

Calcium was detected in method blank MB 280-435471/1-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-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/01/2018 and analyzed on 11/02/2018.

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

TOTAL MERCURY

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 11/01/2018 and analyzed on 11/02/2018.

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

TOTAL DISSOLVED SOLIDS

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on

Case Narrative

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

TestAmerica Job ID: 280-116234-1

Job ID: 280-116234-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

10/30/2018.

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

TOTAL SUSPENDED SOLIDS

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 11/07/2018.

Reanalysis of the following samples were performed outside of the analytical holding time due to QC failure in the first batch : MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6). LCS failed low in the original batch; therefore, original results may be biased low. As instructed by the client, the reanalysis results are reported with acceptable QC.

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

CORROSIVITY (PH)

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 11/08/2018.

The following sample did not converge to constant pH within a 0.05 interval after three measurements: MW-14 EB (280-116234-6) This behavior was also observed in analytical batches 436040 and 436640.

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 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 11/20/2018 and 11/21/2018.

Samples MW-14 (280-116234-1)[10X], MW-15 (280-116234-2)[10X], MW-16 (280-116234-3)[10X], MW-17 (280-116234-4)[10X] and MW-17 DUP (280-116234-5)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Chloride and Sulfate were detected in method blank MB 280-438340/13 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have 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. Sample matrix interference is suspected.

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

RADIUM-226 (GFPC)

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 10/31/2018 and analyzed on 11/23/2018.

Radium-226 was detected in method blank MB 160-398424/23-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate. Refer to the QC report for details.

The following sample was prepared at a reduced aliquot due to potential matrix interference (discoloration and heavy sediment levels): MW-14 (280-116234-1).

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

RADIUM-228

Samples MW-14 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5)

Case Narrative

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

TestAmerica Job ID: 280-116234-1

Job ID: 280-116234-1 (Continued)

Laboratory: TestAmerica Denver (Continued)

and MW-14 EB (280-116234-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 10/31/2018 and analyzed on 11/19/2018.

The following sample was prepared at a reduced aliquot due to potential matrix interference (discoloration and heavy sediment levels): MW-14 (280-116234-1).

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 (280-116234-1), MW-15 (280-116234-2), MW-16 (280-116234-3), MW-17 (280-116234-4), MW-17 DUP (280-116234-5) and MW-14 EB (280-116234-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 11/26/2018.

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-14

Lab Sample ID: 280-116234-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	1600		100	4.4	ug/L		1		6010C	Total
Calcium	200000	B	200	35	ug/L		1		6010C	Recoverable Total
Barium	0.070		0.0050	0.0022	mg/L		1		6020A	Recoverable Total
Cadmium	0.00031	J	0.0010	0.00021	mg/L		1		6020A	Recoverable Total
Cobalt	0.0013		0.0010	0.00019	mg/L		1		6020A	Recoverable Total
Chromium	0.0091		0.0020	0.00098	mg/L		1		6020A	Recoverable Total
Molybdenum	0.022		0.010	0.0011	mg/L		1		6020A	Recoverable Total
Lead	0.0010		0.0010	0.00045	mg/L		1		6020A	Recoverable Total
Selenium	0.0056		0.0050	0.00089	mg/L		1		6020A	Recoverable Total
Lithium	0.082		0.0080	0.0017	mg/L		1		6020A	Recoverable Total
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU		1		9040B	Total/NA
Temperature	23.2	HF	1.0	1.0	Degrees C		1		9040B	Total/NA
Chloride	320	B	30	2.5	mg/L		10		9056A	Total/NA
Fluoride	1.8		0.50	0.060	mg/L		1		9056A	Total/NA
Sulfate	350	B	50	2.3	mg/L		10		9056A	Total/NA
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L		1		SM 2540C	Total/NA
Total Suspended Solids	620	H	10	2.8	mg/L		1		SM 2540D	Total/NA

Client Sample ID: MW-15

Lab Sample ID: 280-116234-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	3100		100	4.4	ug/L		1		6010C	Total
Calcium	190000	B	200	35	ug/L		1		6010C	Recoverable Total
Antimony	0.0015	J	0.0020	0.00057	mg/L		1		6020A	Recoverable Total
Arsenic	0.0030	J	0.0050	0.00075	mg/L		1		6020A	Recoverable Total
Barium	0.063		0.0050	0.0022	mg/L		1		6020A	Recoverable Total
Cobalt	0.0027		0.0010	0.00019	mg/L		1		6020A	Recoverable Total
Chromium	0.0021		0.0020	0.00098	mg/L		1		6020A	Recoverable Total
Molybdenum	0.030		0.010	0.0011	mg/L		1		6020A	Recoverable Total
Selenium	0.012		0.0050	0.00089	mg/L		1		6020A	Recoverable Total
Lithium	0.083		0.0080	0.0017	mg/L		1		6020A	Recoverable Total
pH adj. to 25 deg C	8.3	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	270	B	30	2.5	mg/L		10		9056A	Total/NA
Fluoride	1.5		0.50	0.060	mg/L		1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-15 (Continued)

Lab Sample ID: 280-116234-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	670	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1700		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	23	H	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-16

Lab Sample ID: 280-116234-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	760		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	220000	B	200	35	ug/L	1		6010C	Total Recoverable
Antimony	0.00084	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	0.042		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00022	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	0.029		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0077		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.097		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.0	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	340	B	30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	700	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J H	4.0	1.1	mg/L	1		SM 2540D	Total/NA

Client Sample ID: MW-17

Lab Sample ID: 280-116234-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	930		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	190000	B	200	35	ug/L	1		6010C	Total Recoverable
Arsenic	0.0043	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	0.00071	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00058	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0016	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.017		0.010	0.0011	mg/L	1		6020A	Total Recoverable

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Detection Summary

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-17 (Continued)

Lab Sample ID: 280-116234-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.0046	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.046		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.0	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	240	B	30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	540	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-17 DUP

Lab Sample ID: 280-116234-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	940		100	4.4	ug/L	1		6010C	Total Recoverable
Calcium	190000	B	200	35	ug/L	1		6010C	Total Recoverable
Arsenic	0.0046	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.045		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00071	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Cobalt	0.00058	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Chromium	0.0014	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Molybdenum	0.017		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0046	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Lithium	0.048		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.0	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	240	B	30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	530	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1400		20	9.4	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-14 EB

Lab Sample ID: 280-116234-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.9	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	0.45	J B	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	0.57	J B	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	10		10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

Method Summary

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

TestAmerica Job ID: 280-116234-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN
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
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL DEN
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: 280-116234-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-116234-1	MW-14	Water	10/25/18 11:00	10/26/18 12:50
280-116234-2	MW-15	Water	10/26/18 11:20	10/26/18 12:50
280-116234-3	MW-16	Water	10/25/18 15:25	10/26/18 12:50
280-116234-4	MW-17	Water	10/25/18 13:15	10/26/18 12:50
280-116234-5	MW-17 DUP	Water	10/25/18 13:40	10/26/18 12:50
280-116234-6	MW-14 EB	Water	10/25/18 10:15	10/26/18 12:50

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

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

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1600		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:29	1
Calcium	200000	B	200	35	ug/L		10/30/18 15:30	10/31/18 15:29	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3100		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:32	1
Calcium	190000	B	200	35	ug/L		10/30/18 15:30	10/31/18 15:32	1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	760		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:36	1
Calcium	220000	B	200	35	ug/L		10/30/18 15:30	10/31/18 15:36	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	930		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:39	1
Calcium	190000	B	200	35	ug/L		10/30/18 15:30	10/31/18 15:39	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	940		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:53	1
Calcium	190000	B	200	35	ug/L		10/30/18 15:30	10/31/18 15:53	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	4.4	ug/L		10/30/18 15:30	10/31/18 15:57	1
Calcium	ND		200	35	ug/L		10/30/18 15:30	10/31/18 15:57	1

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

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:51	1
Arsenic	ND		0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:51	1
Barium	0.070		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:51	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:51	1
Cadmium	0.00031	J	0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:51	1
Cobalt	0.0013		0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:51	1
Chromium	0.0091		0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:51	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

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

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	0.022		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:51	1
Lead	0.0010		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:51	1
Selenium	0.0056		0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:51	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:51	1
Lithium	0.082		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:51	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:10	1
Arsenic	0.0030	J	0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:10	1
Barium	0.063		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:10	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:10	1
Cadmium	ND		0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:10	1
Cobalt	0.0027		0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:10	1
Chromium	0.0021		0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:10	1
Molybdenum	0.030		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:10	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:10	1
Selenium	0.012		0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:10	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:10	1
Lithium	0.083		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:10	1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00084	J	0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:14	1
Arsenic	0.0032	J	0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:14	1
Barium	0.042		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:14	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:14	1
Cadmium	0.00022	J	0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:14	1
Cobalt	0.00054	J	0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:14	1
Chromium	ND		0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:14	1
Molybdenum	0.029		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:14	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:14	1
Selenium	0.0077		0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:14	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:14	1
Lithium	0.097		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:14	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:19	1
Arsenic	0.0043	J	0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:19	1
Barium	0.043		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:19	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:19	1
Cadmium	0.00071	J	0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:19	1
Cobalt	0.00058	J	0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:19	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

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

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	0.0016	J	0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:19	1
Molybdenum	0.017		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:19	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:19	1
Selenium	0.0046	J	0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:19	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:19	1
Lithium	0.046		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:19	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:23	1
Arsenic	0.0046	J	0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:23	1
Barium	0.045		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:23	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:23	1
Cadmium	0.00071	J	0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:23	1
Cobalt	0.00058	J	0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:23	1
Chromium	0.0014	J	0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:23	1
Molybdenum	0.017		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:23	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:23	1
Selenium	0.0046	J	0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:23	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:23	1
Lithium	0.048		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:23	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:28	1
Arsenic	ND		0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:28	1
Barium	ND		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:28	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:28	1
Cadmium	ND		0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:28	1
Cobalt	ND		0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:28	1
Chromium	ND		0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:28	1
Molybdenum	ND		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:28	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:28	1
Selenium	ND		0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:28	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:28	1
Lithium	ND		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:28	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/01/18 12:00	11/02/18 14:43	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	11/01/18 12:00	11/02/18 14:49	1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	11/01/18 12:00	11/02/18 14:51	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	11/01/18 12:00	11/02/18 14:53	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	11/01/18 12:00	11/02/18 14:55	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L	-	11/01/18 12:00	11/02/18 14:57	1

General Chemistry

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
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	-		11/08/18 10:30	1
Temperature	23.2	HF	1.0	1.0	Degrees C			11/08/18 10:30	1
Chloride	320	B	30	2.5	mg/L			11/20/18 22:45	10
Fluoride	1.8		0.50	0.060	mg/L			11/20/18 22:27	1
Sulfate	350	B	50	2.3	mg/L			11/20/18 22:45	10
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L			10/30/18 12:46	1
Total Suspended Solids	620	H	10	2.8	mg/L			11/07/18 15:19	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.3	HF	0.1	0.1	SU	-		11/08/18 10:43	1
Temperature	22.7	HF	1.0	1.0	Degrees C			11/08/18 10:43	1
Chloride	270	B	30	2.5	mg/L			11/20/18 23:20	10
Fluoride	1.5		0.50	0.060	mg/L			11/20/18 23:02	1
Sulfate	670	B	50	2.3	mg/L			11/20/18 23:20	10
Total Dissolved Solids (TDS)	1700		20	9.4	mg/L			10/30/18 12:46	1
Total Suspended Solids	23	H	4.0	1.1	mg/L			11/07/18 15:19	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
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			11/08/18 10:39	1
Temperature	22.7	HF	1.0	1.0	Degrees C			11/08/18 10:39	1
Chloride	340	B	30	2.5	mg/L			11/20/18 23:55	10
Fluoride	2.3		0.50	0.060	mg/L			11/20/18 23:37	1
Sulfate	700	B	50	2.3	mg/L			11/20/18 23:55	10
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L			10/30/18 12:46	1
Total Suspended Solids	1.2	J H	4.0	1.1	mg/L			11/07/18 15:19	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
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			11/08/18 10:34	1
Temperature	22.9	HF	1.0	1.0	Degrees C			11/08/18 10:34	1
Chloride	240	B	30	2.5	mg/L			11/21/18 00:30	10
Fluoride	2.0		0.50	0.060	mg/L			11/21/18 00:12	1
Sulfate	540	B	50	2.3	mg/L			11/21/18 00:30	10
Total Dissolved Solids (TDS)	1500		20	9.4	mg/L			10/30/18 12:46	1
Total Suspended Solids	ND	H	4.0	1.1	mg/L			11/07/18 15:19	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
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			11/08/18 10:47	1
Temperature	22.7	HF	1.0	1.0	Degrees C			11/08/18 10:47	1
Chloride	240	B	30	2.5	mg/L			11/21/18 01:05	10
Fluoride	2.0		0.50	0.060	mg/L			11/21/18 00:47	1
Sulfate	530	B	50	2.3	mg/L			11/21/18 01:05	10
Total Dissolved Solids (TDS)	1400		20	9.4	mg/L			10/30/18 12:46	1
Total Suspended Solids	ND	H	4.0	1.1	mg/L			11/07/18 15:19	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.7	HF	0.1	0.1	SU			11/08/18 10:54	1
Temperature	22.9	HF	1.0	1.0	Degrees C			11/08/18 10:54	1
Chloride	0.45	J B	3.0	0.25	mg/L			11/21/18 01:57	1
Fluoride	ND		0.50	0.060	mg/L			11/21/18 01:57	1
Sulfate	0.57	J B	5.0	0.23	mg/L			11/21/18 01:57	1
Total Dissolved Solids (TDS)	10		10	4.7	mg/L			10/30/18 12:46	1
Total Suspended Solids	ND	H	4.0	1.1	mg/L			11/07/18 15:19	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.659		0.190	0.199	1.00	0.135	pCi/L	10/31/18 09:03	11/23/18 12:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					10/31/18 09:03	11/23/18 12:36	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.313		0.115	0.118	1.00	0.110	pCi/L	10/31/18 09:03	11/23/18 12:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					10/31/18 09:03	11/23/18 12:36	1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.354		0.119	0.123	1.00	0.113	pCi/L	10/31/18 09:03	11/23/18 12:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					10/31/18 09:03	11/23/18 12:36	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.338		0.116	0.119	1.00	0.0969	pCi/L	10/31/18 09:03	11/23/18 12:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					10/31/18 09:03	11/23/18 12:36	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.317		0.111	0.115	1.00	0.0970	pCi/L	10/31/18 09:03	11/23/18 12:36	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					10/31/18 09:03	11/23/18 12:36	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.244		0.102	0.104	1.00	0.102	pCi/L	10/31/18 09:03	11/23/18 12:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					10/31/18 09:03	11/23/18 12:37	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.685		0.366	0.371	1.00	0.546	pCi/L	10/31/18 10:10	11/19/18 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					10/31/18 10:10	11/19/18 12:08	1
Y Carrier	82.2		40 - 110					10/31/18 10:10	11/19/18 12:08	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.441		0.240	0.243	1.00	0.357	pCi/L	10/31/18 10:10	11/19/18 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					10/31/18 10:10	11/19/18 12:08	1
Y Carrier	79.3		40 - 110					10/31/18 10:10	11/19/18 12:08	1

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.720		0.252	0.261	1.00	0.332	pCi/L	10/31/18 10:10	11/19/18 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					10/31/18 10:10	11/19/18 12:08	1
Y Carrier	78.9		40 - 110					10/31/18 10:10	11/19/18 12:08	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.524		0.238	0.243	1.00	0.339	pCi/L	10/31/18 10:10	11/19/18 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	105		40 - 110					10/31/18 10:10	11/19/18 12:08	1
Y Carrier	80.4		40 - 110					10/31/18 10:10	11/19/18 12:08	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.687		0.270	0.277	1.00	0.378	pCi/L	10/31/18 10:10	11/19/18 12:08	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	106		40 - 110					10/31/18 10:10	11/19/18 12:08	1
Y Carrier	79.6		40 - 110					10/31/18 10:10	11/19/18 12:08	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.150	U	0.217	0.218	1.00	0.364	pCi/L	10/31/18 10:10	11/19/18 12:09	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					10/31/18 10:10	11/19/18 12:09	1
Y Carrier	80.4		40 - 110					10/31/18 10:10	11/19/18 12:09	1

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

Client Sample ID: MW-14
Date Collected: 10/25/18 11:00
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.34		0.412	0.421	5.00	0.546	pCi/L		11/26/18 15:24	1

Client Sample ID: MW-15
Date Collected: 10/26/18 11:20
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.754		0.266	0.270	5.00	0.357	pCi/L		11/26/18 15:24	1

TestAmerica Denver

Client Sample Results

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

TestAmerica Job ID: 280-116234-1

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

Client Sample ID: MW-16
Date Collected: 10/25/18 15:25
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.07		0.279	0.289	5.00	0.332	pCi/L		11/26/18 15:24	1

Client Sample ID: MW-17
Date Collected: 10/25/18 13:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.863		0.265	0.271	5.00	0.339	pCi/L		11/26/18 15:24	1

Client Sample ID: MW-17 DUP
Date Collected: 10/25/18 13:40
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.00		0.292	0.300	5.00	0.378	pCi/L		11/26/18 15:24	1

Client Sample ID: MW-14 EB
Date Collected: 10/25/18 10:15
Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.394		0.240	0.242	5.00	0.364	pCi/L		11/26/18 15:24	1

QC Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-435471/1-A
Matrix: Water
Analysis Batch: 435819

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 435471

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	4.4	ug/L		10/30/18 15:30	10/31/18 14:28	1
Calcium	39.4	J	200	35	ug/L		10/30/18 15:30	10/31/18 14:28	1

Lab Sample ID: LCS 280-435471/2-A
Matrix: Water
Analysis Batch: 435819

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 435471

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1000	1050		ug/L		105	86 - 110
Calcium	50000	51100		ug/L		102	90 - 111

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 240-353096/1-A
Matrix: Water
Analysis Batch: 353618

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 353096

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		11/01/18 14:00	11/02/18 12:42	1
Arsenic	ND		0.0050	0.00075	mg/L		11/01/18 14:00	11/02/18 12:42	1
Barium	ND		0.0050	0.0022	mg/L		11/01/18 14:00	11/02/18 12:42	1
Beryllium	ND		0.0010	0.00031	mg/L		11/01/18 14:00	11/02/18 12:42	1
Cadmium	ND		0.0010	0.00021	mg/L		11/01/18 14:00	11/02/18 12:42	1
Cobalt	ND		0.0010	0.00019	mg/L		11/01/18 14:00	11/02/18 12:42	1
Chromium	ND		0.0020	0.00098	mg/L		11/01/18 14:00	11/02/18 12:42	1
Molybdenum	ND		0.010	0.0011	mg/L		11/01/18 14:00	11/02/18 12:42	1
Lead	ND		0.0010	0.00045	mg/L		11/01/18 14:00	11/02/18 12:42	1
Selenium	ND		0.0050	0.00089	mg/L		11/01/18 14:00	11/02/18 12:42	1
Thallium	ND		0.0010	0.00020	mg/L		11/01/18 14:00	11/02/18 12:42	1
Lithium	ND		0.0080	0.0017	mg/L		11/01/18 14:00	11/02/18 12:42	1

Lab Sample ID: LCS 240-353096/3-A
Matrix: Water
Analysis Batch: 353618

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 353096

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0956		mg/L		96	80 - 120
Arsenic	1.00	0.971		mg/L		97	80 - 120
Barium	1.00	0.974		mg/L		97	80 - 120
Beryllium	1.00	0.963		mg/L		96	80 - 120
Cadmium	1.00	0.958		mg/L		96	80 - 120
Cobalt	1.00	1.02		mg/L		102	80 - 120
Chromium	1.00	0.969		mg/L		97	80 - 120
Molybdenum	0.100	0.0960		mg/L		96	80 - 120
Lead	1.00	0.990		mg/L		99	80 - 120
Selenium	1.00	0.972		mg/L		97	80 - 120
Thallium	0.250	0.242		mg/L		97	80 - 120
Lithium	0.100	0.0950		mg/L		95	80 - 120

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 240-353102/1-A
Matrix: Water
Analysis Batch: 353407

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 353102

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.13	ug/L		11/01/18 12:00	11/02/18 14:24	1

Lab Sample ID: LCS 240-353102/2-A
Matrix: Water
Analysis Batch: 353407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 353102

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.57		ug/L		111	80 - 120

Method: 9040B - pH

Lab Sample ID: LCS 280-436848/54
Matrix: Water
Analysis Batch: 436848

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 280-438340/13
Matrix: Water
Analysis Batch: 438340

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.440	J	3.0	0.25	mg/L			11/20/18 20:52	1
Fluoride	ND		0.50	0.060	mg/L			11/20/18 20:52	1
Sulfate	0.541	J	5.0	0.23	mg/L			11/20/18 20:52	1

Lab Sample ID: LCS 280-438340/11
Matrix: Water
Analysis Batch: 438340

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	95.5		mg/L		96	90 - 110
Fluoride	5.00	4.98		mg/L		100	90 - 110
Sulfate	100	98.9		mg/L		99	90 - 110

Lab Sample ID: LCSD 280-438340/12
Matrix: Water
Analysis Batch: 438340

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	95.4		mg/L		95	90 - 110	0	10
Fluoride	5.00	4.96		mg/L		99	90 - 110	0	10
Sulfate	100	98.8		mg/L		99	90 - 110	0	10

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-116234-1

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

Lab Sample ID: MRL 280-438340/10

Matrix: Water

Analysis Batch: 438340

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	2.50	2.38	J	mg/L		95	50 - 150
Fluoride	0.200	0.224	J	mg/L		112	50 - 150
Sulfate	2.50	2.34	J	mg/L		94	50 - 150

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

Lab Sample ID: MB 280-435545/1

Matrix: Water

Analysis Batch: 435545

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			10/30/18 12:46	1

Lab Sample ID: LCS 280-435545/2

Matrix: Water

Analysis Batch: 435545

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Dissolved Solids (TDS)	501	512		mg/L		102	86 - 110

Lab Sample ID: 280-116234-6 DU

Matrix: Water

Analysis Batch: 435545

Client Sample ID: MW-14 EB

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	10		11.0		mg/L		10	10

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

Lab Sample ID: MB 280-436706/1

Matrix: Water

Analysis Batch: 436706

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	ND		4.0	1.1	mg/L			11/07/18 15:19	1

Lab Sample ID: LCS 280-436706/2

Matrix: Water

Analysis Batch: 436706

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	86.8		mg/L		87	86 - 114

TestAmerica Denver

QC Sample Results

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

TestAmerica Job ID: 280-116234-1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-398424/23-A

Matrix: Water

Analysis Batch: 402353

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 398424

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.1204		0.0743	0.0751	1.00	0.0882	pCi/L	10/31/18 09:03	11/23/18 12:37	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					10/31/18 09:03	11/23/18 12:37	1

Lab Sample ID: LCS 160-398424/1-A

Matrix: Water

Analysis Batch: 402353

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 398424

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226		11.4	10.19		1.10	1.00	0.0981	pCi/L	90	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	100		40 - 110							

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-398428/23-A

Matrix: Water

Analysis Batch: 401654

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 398428

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1926	U	0.232	0.233	1.00	0.383	pCi/L	10/31/18 10:10	11/19/18 12:54	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	110		40 - 110					10/31/18 10:10	11/19/18 12:54	1
Y Carrier	82.2		40 - 110					10/31/18 10:10	11/19/18 12:54	1

Lab Sample ID: LCS 160-398428/1-A

Matrix: Water

Analysis Batch: 401596

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 398428

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228		9.20	9.967		1.15	1.00	0.390	pCi/L	108	56 - 140
Carrier	LCS %Yield	LCS Qualifier	Limits							
Ba Carrier	100		40 - 110							
Y Carrier	78.1		40 - 110							

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-116234-1

Metals

Prep Batch: 353096

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total Recoverable	Water	3005A	
280-116234-2	MW-15	Total Recoverable	Water	3005A	
280-116234-3	MW-16	Total Recoverable	Water	3005A	
280-116234-4	MW-17	Total Recoverable	Water	3005A	
280-116234-5	MW-17 DUP	Total Recoverable	Water	3005A	
280-116234-6	MW-14 EB	Total Recoverable	Water	3005A	
MB 240-353096/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-353096/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

Prep Batch: 353102

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	7470A	
280-116234-2	MW-15	Total/NA	Water	7470A	
280-116234-3	MW-16	Total/NA	Water	7470A	
280-116234-4	MW-17	Total/NA	Water	7470A	
280-116234-5	MW-17 DUP	Total/NA	Water	7470A	
280-116234-6	MW-14 EB	Total/NA	Water	7470A	
MB 240-353102/1-A	Method Blank	Total/NA	Water	7470A	
LCS 240-353102/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 353407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	7470A	353102
280-116234-2	MW-15	Total/NA	Water	7470A	353102
280-116234-3	MW-16	Total/NA	Water	7470A	353102
280-116234-4	MW-17	Total/NA	Water	7470A	353102
280-116234-5	MW-17 DUP	Total/NA	Water	7470A	353102
280-116234-6	MW-14 EB	Total/NA	Water	7470A	353102
MB 240-353102/1-A	Method Blank	Total/NA	Water	7470A	353102
LCS 240-353102/2-A	Lab Control Sample	Total/NA	Water	7470A	353102

Analysis Batch: 353618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total Recoverable	Water	6020A	353096
280-116234-2	MW-15	Total Recoverable	Water	6020A	353096
280-116234-3	MW-16	Total Recoverable	Water	6020A	353096
280-116234-4	MW-17	Total Recoverable	Water	6020A	353096
280-116234-5	MW-17 DUP	Total Recoverable	Water	6020A	353096
280-116234-6	MW-14 EB	Total Recoverable	Water	6020A	353096
MB 240-353096/1-A	Method Blank	Total Recoverable	Water	6020A	353096
LCS 240-353096/3-A	Lab Control Sample	Total Recoverable	Water	6020A	353096

Prep Batch: 435471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total Recoverable	Water	3005A	
280-116234-2	MW-15	Total Recoverable	Water	3005A	
280-116234-3	MW-16	Total Recoverable	Water	3005A	
280-116234-4	MW-17	Total Recoverable	Water	3005A	
280-116234-5	MW-17 DUP	Total Recoverable	Water	3005A	
280-116234-6	MW-14 EB	Total Recoverable	Water	3005A	
MB 280-435471/1-A	Method Blank	Total Recoverable	Water	3005A	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-116234-1

Metals (Continued)

Prep Batch: 435471 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-435471/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 435819

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total Recoverable	Water	6010C	435471
280-116234-2	MW-15	Total Recoverable	Water	6010C	435471
280-116234-3	MW-16	Total Recoverable	Water	6010C	435471
280-116234-4	MW-17	Total Recoverable	Water	6010C	435471
280-116234-5	MW-17 DUP	Total Recoverable	Water	6010C	435471
280-116234-6	MW-14 EB	Total Recoverable	Water	6010C	435471
MB 280-435471/1-A	Method Blank	Total Recoverable	Water	6010C	435471
LCS 280-435471/2-A	Lab Control Sample	Total Recoverable	Water	6010C	435471

General Chemistry

Analysis Batch: 435545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	SM 2540C	
280-116234-2	MW-15	Total/NA	Water	SM 2540C	
280-116234-3	MW-16	Total/NA	Water	SM 2540C	
280-116234-4	MW-17	Total/NA	Water	SM 2540C	
280-116234-5	MW-17 DUP	Total/NA	Water	SM 2540C	
280-116234-6	MW-14 EB	Total/NA	Water	SM 2540C	
MB 280-435545/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-435545/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-116234-6 DU	MW-14 EB	Total/NA	Water	SM 2540C	

Analysis Batch: 436706

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	SM 2540D	
280-116234-2	MW-15	Total/NA	Water	SM 2540D	
280-116234-3	MW-16	Total/NA	Water	SM 2540D	
280-116234-4	MW-17	Total/NA	Water	SM 2540D	
280-116234-5	MW-17 DUP	Total/NA	Water	SM 2540D	
280-116234-6	MW-14 EB	Total/NA	Water	SM 2540D	
MB 280-436706/1	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-436706/2	Lab Control Sample	Total/NA	Water	SM 2540D	

Analysis Batch: 436848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	9040B	
280-116234-2	MW-15	Total/NA	Water	9040B	
280-116234-3	MW-16	Total/NA	Water	9040B	
280-116234-4	MW-17	Total/NA	Water	9040B	
280-116234-5	MW-17 DUP	Total/NA	Water	9040B	
280-116234-6	MW-14 EB	Total/NA	Water	9040B	
LCS 280-436848/54	Lab Control Sample	Total/NA	Water	9040B	

TestAmerica Denver

QC Association Summary

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

TestAmerica Job ID: 280-116234-1

General Chemistry (Continued)

Analysis Batch: 438340

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	9056A	
280-116234-1	MW-14	Total/NA	Water	9056A	
280-116234-2	MW-15	Total/NA	Water	9056A	
280-116234-2	MW-15	Total/NA	Water	9056A	
280-116234-3	MW-16	Total/NA	Water	9056A	
280-116234-3	MW-16	Total/NA	Water	9056A	
280-116234-4	MW-17	Total/NA	Water	9056A	
280-116234-4	MW-17	Total/NA	Water	9056A	
280-116234-5	MW-17 DUP	Total/NA	Water	9056A	
280-116234-5	MW-17 DUP	Total/NA	Water	9056A	
280-116234-6	MW-14 EB	Total/NA	Water	9056A	
MB 280-438340/13	Method Blank	Total/NA	Water	9056A	
LCS 280-438340/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-438340/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-438340/10	Lab Control Sample	Total/NA	Water	9056A	

Rad

Prep Batch: 398424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	PrecSep-21	
280-116234-2	MW-15	Total/NA	Water	PrecSep-21	
280-116234-3	MW-16	Total/NA	Water	PrecSep-21	
280-116234-4	MW-17	Total/NA	Water	PrecSep-21	
280-116234-5	MW-17 DUP	Total/NA	Water	PrecSep-21	
280-116234-6	MW-14 EB	Total/NA	Water	PrecSep-21	
MB 160-398424/23-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-398424/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

Prep Batch: 398428

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-116234-1	MW-14	Total/NA	Water	PrecSep_0	
280-116234-2	MW-15	Total/NA	Water	PrecSep_0	
280-116234-3	MW-16	Total/NA	Water	PrecSep_0	
280-116234-4	MW-17	Total/NA	Water	PrecSep_0	
280-116234-5	MW-17 DUP	Total/NA	Water	PrecSep_0	
280-116234-6	MW-14 EB	Total/NA	Water	PrecSep_0	
MB 160-398428/23-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-398428/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-14

Date Collected: 10/25/18 11:00

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-1

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:29	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:51	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:43	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:30	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/20/18 22:27	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	438340	11/20/18 22:45	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	100 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			750.60 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:36	CDR	TAL SL
Total/NA	Prep	PrecSep_0			750.60 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1			401643	11/19/18 12:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	TAL SL

Client Sample ID: MW-15

Date Collected: 10/26/18 11:20

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-2

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:32	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:10	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:49	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:43	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/20/18 23:02	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	438340	11/20/18 23:20	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.17 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:36	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.17 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1			401643	11/19/18 12:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-16

Date Collected: 10/25/18 15:25

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-3

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:36	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:14	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:51	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:39	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/20/18 23:37	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	438340	11/20/18 23:55	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.88 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:36	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.88 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1			401643	11/19/18 12:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	TAL SL

Client Sample ID: MW-17

Date Collected: 10/25/18 13:15

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-4

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:39	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:19	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:53	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:34	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/21/18 00:12	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	438340	11/21/18 00:30	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.42 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:36	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.42 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1			401643	11/19/18 12:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	TAL SL

TestAmerica Denver

Lab Chronicle

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

TestAmerica Job ID: 280-116234-1

Client Sample ID: MW-17 DUP

Date Collected: 10/25/18 13:40

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-5

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:53	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:23	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:55	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:47	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/21/18 00:47	TLP	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	438340	11/21/18 01:05	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.37 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:36	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.37 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1			401643	11/19/18 12:08	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	TAL SL

Client Sample ID: MW-14 EB

Date Collected: 10/25/18 10:15

Date Received: 10/26/18 12:50

Lab Sample ID: 280-116234-6

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	435471	10/30/18 15:30	LRD	TAL DEN
Total Recoverable	Analysis	6010C		1			435819	10/31/18 15:57	CML	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	353096	11/01/18 14:00	MBB	TAL CAN
Total Recoverable	Analysis	6020A		1			353618	11/02/18 12:28	DSH	TAL CAN
Total/NA	Prep	7470A			50 mL	50 mL	353102	11/01/18 12:00	MBB	TAL CAN
Total/NA	Analysis	7470A		1			353407	11/02/18 14:57	WKD	TAL CAN
Total/NA	Analysis	9040B		1			436848	11/08/18 10:54	SGB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	438340	11/21/18 01:57	TLP	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	435545	10/30/18 12:46	MJS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	436706	11/07/18 15:19	MJS	TAL DEN
Total/NA	Prep	PrecSep-21			1000.03 mL	1.0 g	398424	10/31/18 09:03	JLC	TAL SL
Total/NA	Analysis	9315		1			402353	11/23/18 12:37	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.03 mL	1.0 g	398428	10/31/18 10:10	JLC	TAL SL
Total/NA	Analysis	9320		1	1.0 mL	1.0 mL	401643	11/19/18 12:09	CDR	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			402686	11/26/18 15:24	RTM	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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-116234-1

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	01-08-19
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	01-31-19
Kentucky (UST)	State Program	4	58	02-23-19
Kentucky (WW)	State Program	4	98016	12-31-18 *
Minnesota	NELAP	5	039-999-348	12-31-18 *
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	01-12-19
West Virginia DEP	State Program	3	210	12-31-18 *

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 ELAP		L2305	04-06-19
Arizona	State Program	9	AZ0813	12-08-18 *
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	11-30-18 *
Iowa	State Program	7	373	12-01-18 *
Kansas	NELAP	7	E-10236	10-31-18 *
Kentucky (DW)	State Program	4	90125	12-31-18
Louisiana	NELAP	6	04080	06-30-19
Louisiana (DW)	NELAP	6	LA180017	12-31-18 *
Maryland	State Program	3	310	09-30-19
Michigan	State Program	5	9005	06-30-18 *
Missouri	State Program	7	780	06-30-19

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

TestAmerica Denver

Accreditation/Certification Summary

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

TestAmerica Job ID: 280-116234-1

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

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

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

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

Client Contact		Project Manager: Matt Rohr		Site Contact: Kaitlin Fishburn		Date:							
HDR Inc	1670 Broadway, Suite 3400	Tel/Fax: 303-764-537	Analysis Turnaround Time	Lab Contact:	Carrier:	COC No:	of COCs						
Denver, CO 80202	Phone	☐ CALENDAR DAYS ☐ WORKING DAYS	TAT if different from Below										
(907) 644-2078	Email	☐ 2 weeks	☐ 1 week										
Project Name: Xcel Energy GW CCR		☐ 2 days	☐ 1 day										
Site: CHEROKEE													
P O #													
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 Suspended Solids	pH, Fluoride, Chloride, Sulfate	Ra226/Ra228 combined	App III - Total Metals: Calcium, Boron	App IV Total Metals (see list)
MW-14	10/25	1100	G	W	6	2	2	X	X	X	X	X	X
MW-15	10/26	1120	G	W	6	2	2	X	X	X	X	X	X
MW-16	10/25	1525	G	W	6	2	2	X	X	X	X	X	X
MW-17	10/25	1315	G	W	6	2	2	X	X	X	X	X	X
MW17 DUP	10/25	1340	G	W	6	2	2	X	X	X	X	X	X
MW14 EB	10/25	1015	G	W	6	2	2	X	X	X	X	X	X
 280-116234 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.													
Special Instructions/QC Requirements & Comments:													
Custody Seal No.: _____													
Custody Seals Intact: ☐ Yes ☐ No													
Relinquished by: Kaitlin Fishburn													
Relinquished by: _____													
Relinquished by: _____													
Cooler Temp. (°C): Obs'd: _____													
Received by: _____													
Received by: _____													
Received in Laboratory by: _____													
Company: _____													
Company: _____													
Company: _____													
Therm ID No.: _____													
Date/Time: 10/26/18 1350													
Date/Time: _____													
Date/Time: _____													

Form No. CA-C-WI-002, Rev. 4.15, dated 9/27/2017

1-6, 0-301, 1-6, 10/26/18

Phone (303) 736-0100 Fax (303) 431-7171

THE LEADER IN ENVIRONMENTAL TESTING

Ver: 09/20/2016

4955 Yarrow Street
Arvada, CO 80002

Phone (303) 736-0100 Fax (303) 431-7171

$$0.8 \overline{)1.7}$$

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)				Lab PM: Bandy, Darlene F		Carrier Tracking No(s): 280-460273.1	
Client Contact: Shipping/Receiving				Phone: E-Mail: darlene.bandy@teslamerica.com		State of Origin: Colorado	
Company: TestAmerica Laboratories, Inc.				Accreditations Required (See note): NELAP - Oregon		Job #: 280-116234-1	
Address: 4101 Shuffel Street NW, City: North Canton State, Zip: OH, 44720				Due Date Requested: 11/19/2018		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 Other:	
Phone: 330-497-9396(Tel) 330-497-0772(Fax)				TAT Requested (days):		Preservation Codes: 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)	
Email: Project Name: Xcel Energy GW CCR Monitoring - Cherokee				PO #: WO #: Project #: 28014371		Analysis Requested	
Site: Xcel Energy CCR - Cherokee Station				SSOW#:		Total Number of containers	
Sample Identification - Client ID (Lab ID)				Sample Date		Sample Time	
Sample Type (C=comp, G=grab)				Matrix (Water, Solid, or other)		Preservation Code:	
Field Filtered Sample (Yes or No)				Perform MS/MSD (Yes or No)		7470A/7470A Prep Mercury	
Field Filtered Sample (Yes or No)				6020A/3005A 12 T Metals (w/collision cell) - ApplV		7470A/7470A Prep Mercury	
Field Filtered Sample (Yes or No)				6020A/3005A 12 T Metals (w/collision cell) - ApplV		7470A/7470A Prep Mercury	
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Field Filtered Sample (Yes or No)				6020A/3005A 12 T Metals (w/collision cell) - ApplV			

TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : _____

Client TA Dome Site Name _____ Cooler unpacked by: 82
 Cooler Received on 10/30/18 Opened on 10/31/18
 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Receipt After-hours: Drop-off Date/Time

Storage Location

TestAmerica Cooler # A 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 +0.9 °C) Observed Cooler Temp. 0.8 °C Corrected Cooler Temp. 1.7 °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
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC849161
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): _____

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-116234-1

Login Number: 116234

List Source: TestAmerica Denver

List Number: 1

Creator: Staack, KiAundra A

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ 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?	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 $<6\text{mm}$ (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-116234-1

Login Number: 116234

List Number: 2

Creator: Dupart, Lacey S

List Source: TestAmerica St. Louis

List Creation: 10/30/18 12:47 PM

Question	Answer	Comment
Radioactivity wasn't checked or is $\leq$ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	0.9
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 $<6\text{mm}$ (1/4").	True	
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: 280-116234-1

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)
280-116234-1	MW-14	94.7
280-116234-2	MW-15	106
280-116234-3	MW-16	105
280-116234-4	MW-17	105
280-116234-5	MW-17 DUP	106
280-116234-6	MW-14 EB	108
LCS 160-398424/1-A	Lab Control Sample	100
MB 160-398424/23-A	Method Blank	110

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)
280-116234-1	MW-14	94.7	82.2
280-116234-2	MW-15	106	79.3
280-116234-3	MW-16	105	78.9
280-116234-4	MW-17	105	80.4
280-116234-5	MW-17 DUP	106	79.6
280-116234-6	MW-14 EB	108	80.4
LCS 160-398428/1-A	Lab Control Sample	100	78.1
MB 160-398428/23-A	Method Blank	110	82.2

Tracer/Carrier Legend

Ba Carrier = Ba Carrier

Y Carrier = Y Carrier