

# BACKGROUND WATER QUALITY STATISTICAL CERTIFICATION


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for Compliance with the Coal Combustion  
Residuals (CCR) Rule

Cherokee Station

*Public Service Company of Colorado*

January 15, 2018





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## Table of Abbreviations and Acronyms

Abbreviation	Definition
BDL	below detection limits
BTV	background threshold value
CCR	Coal Combustion Residuals
COI	constituent of interest
EDD	electronic data deliverable
EPA	Environmental Protection Agency
GOF	Goodness-of-Fit
LCS	Laboratory Control Samples
MDL	method detection limit
MLE	Maximum Likelihood Estimate
MS/MSD	Matrix Spike/Duplicate
ND	non-detects
QC	quality control
RL	reporting limit
SOP	Standard Operating Procedure
SSI	statistically significant increase
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UPL	upper prediction limit



# Certification

## Background Water Quality Statistical Certification for Compliance with the Coal Combustion Residuals Rule

I hereby certify to the best of my knowledge that the selected statistical method is appropriate for evaluating the groundwater monitoring data for the CCR management area.

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**), has three incised active impoundments subject to the CCR Rule: the West, Center, and East bottom ash impoundments (**Figure 2**). Part 257.93 of the Rule requires that a certification be obtained from a professional engineer describing the statistical method selected to evaluate the groundwater monitoring data at the facility.

The objective of this report is to document the selection of the statistical method for each Appendix III and IV constituent of interest (COI) in the background/upgradient well for the multi-unit CCR facility. At Cherokee, groundwater monitoring has been conducted to collect eight rounds of background sampling before October 17, 2017 as specified under CCR Rule Part 257.94. The water quality data collected from the monitoring well located upgradient of the CCR units has been compiled and statistically analyzed to develop background threshold values (BTVs) for each COI.. The statistical method selected to represent background water quality is the upper prediction limit (UPL) and is one of the methods described in the CCR Rule Part 257.93 (f)(3). This background water quality report documents the background sample events and describes the statistics performed to develop the BTVs.

# 2.0 Facility Description

Historically, Cherokee Station was a coal-fired, steam turbine electric generating station; the fuel source for the existing coal-fired units was sub-bituminous, low-sulfur coal supplied by several mines in western Colorado. Cherokee Station ceased burning coal in August 2017. During the active coal operations, the West, Center, and East impoundments were used for temporary storage of bottom ash. All three CCR impoundments no longer receive CCR material, and are scheduled to be closed in 2018. 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 CCR units operation and monitoring are described further in the Cherokee Station Groundwater Monitoring System Certification (HDR, 2016).

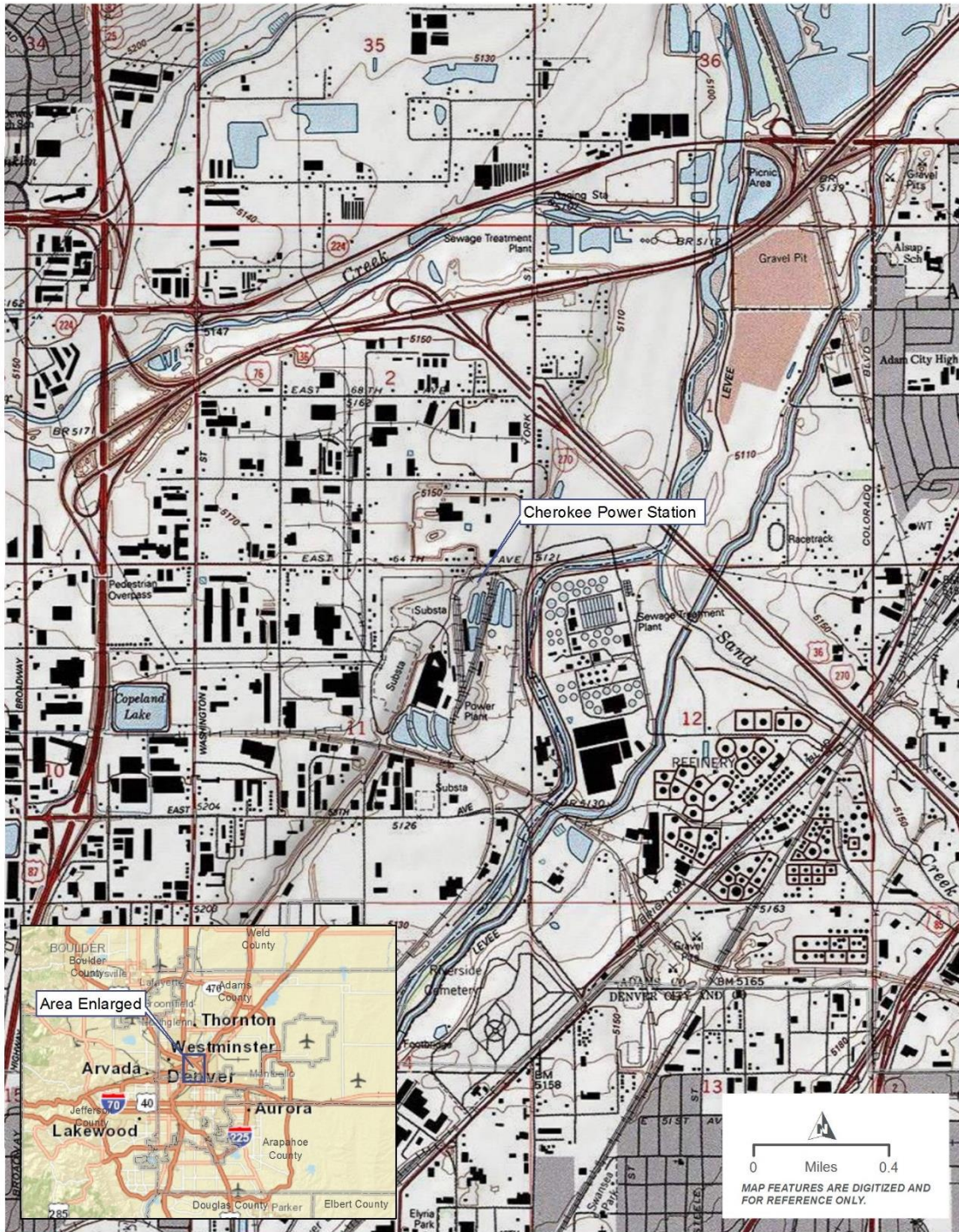
## 2.1 Hydrogeology

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 facility flows east, perpendicular to the South Platte River, where it ultimately discharges to the river (GeoTrans, Inc., 2009). In the area of the 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).

The flow of groundwater is eastward, perpendicular to the length of the impoundments. Based upon potentiometric contour mapping, two wells (MW-7 and MW-13) are located hydraulically upgradient of all three of the impoundments. Of these two, well MW-13 has been identified as the background



monitoring well for the CCR units (**Figure 2**). Further hydrogeologic characterization of the site is provided in the Cherokee Station Groundwater Monitoring System Certification (HDR, 2016).



**CHEROKEE POWER STATION**  
DENVER, CO

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Figure 1. Vicinity map for Cherokee Station.



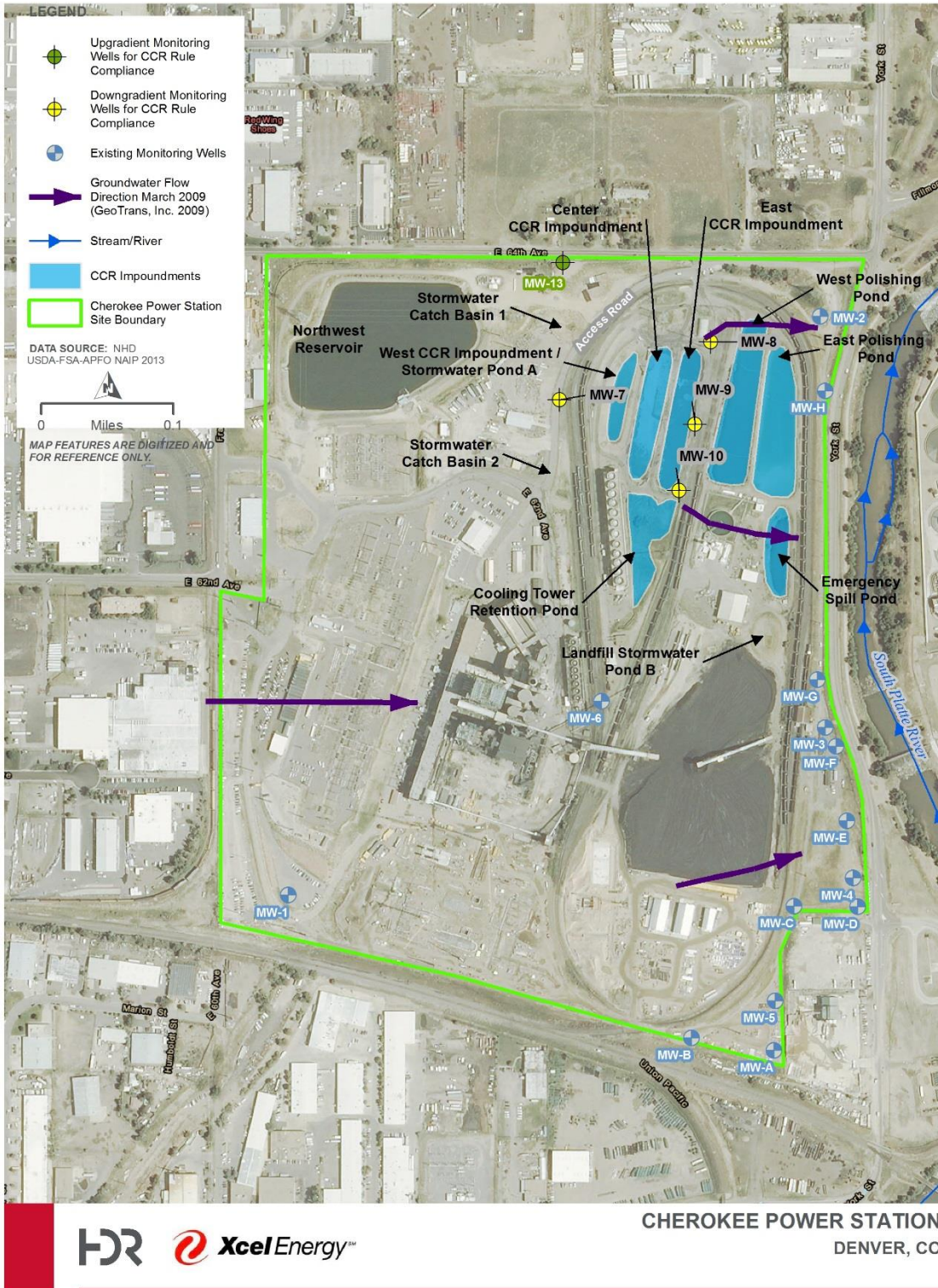


Figure 2. Cherokee Station – CCR units and monitoring well location map.

## 3.0 Monitoring Methods

### 3.1 Monitoring Frequency

As stipulated in the CCR Rule, eight background groundwater sampling events were completed before October 17, 2017. The CCR groundwater sampling program for Cherokee Station has been designed so that sampling was conducted on a quarterly basis between fourth quarter 2015 and third quarter 2017. This Background Water Quality Statistical Certification presents the results from the eight quarterly events, completed on the following dates:

- ✓ December 8-11, 2015
- ✓ February 29 - March 1, 2016
- ✓ May 4-5, 2016
- ✓ August 22-23, 2016
- ✓ November 7-8, 2016
- ✓ February 27-March 1, 2017
- ✓ May 15, 2017
- ✓ July 17-18, 2017

### 3.2 Water Levels and Sample Collection

Water levels were recorded for each well prior to sample collection. Groundwater quality samples were collected from each of the five monitoring wells. Groundwater sample collection protocols followed the Groundwater Sample Collection Standard Operating Procedure (SOP) (HDR, 2015). 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. Water samples were delivered under Chain of Custody to Test America in Denver, Colorado.

### 3.3 Analytical Testing

Groundwater samples were analyzed for the parameters shown in **Table 1**, which include all of the parameters in Appendices III and IV of CCR Rule Part 257. In addition to the parameters listed in Table 1, each sample was also analyzed for Total Suspended Solids (TSS), which can bias resulting total metals concentrations, as compared to dissolved metals concentrations.



<b>Table 1. Groundwater quality parameters</b>	
<b>Appendix III Constituents for Detection Monitoring</b>	<b>Appendix IV Constituents for Assessment Monitoring</b>
Boron	Antimony
Calcium	Arsenic
Chloride	Barium
Fluoride	Beryllium
pH	Cadmium
Sulfate	Chromium
Total Dissolved Solids (TDS)	Cobalt
<b>Additional Parameters</b>	Fluoride
Total Suspended Solids (TSS)	Lead
	Lithium
	Mercury
	Molybdenum
	Selenium
	Thallium
	Radium-226 and -228 combined

## 4.0 Data Validation and Data Management

All data validation was performed per the Data Management and Statistical Procedures Plan for Compliance with the Coal Combustion Residuals Rule document (HDR, 2018). This evaluation, completed by the HDR Project Chemist, included a review of field Quality Control (QC), lab QC, and analytical samples, along with calibration information. QC analyses on Laboratory Control Samples (LCS), Matrix Spike/Duplicate (MS/MSD) samples, and Field Duplicate samples were performed per required quota.

Data management for all sampling events follows the protocol detailed in the Data Management and Statistical Procedures Plan (HDR, 2018). The Project Data Manager inputs data from field data forms into an Excel database, specifically recording static water level data, field parameter values, and general pertinent field observations. The Project Database Manager acquires the electronic field database from the Data Manager and the laboratory electronic data deliverable (EDD) files after receiving notification from the Data Validator that the data validation process is complete. Review includes ensuring that the EDD files conform to the required structure and language of the database. Certain fields within the EDD files have regulated language that must correspond to the lookup/valid value reference tables contained in the database, which helps to ensure that data are coded and stored uniformly within the database; this is known as parity. Adjustments are made, as necessary, to ensure that all samples and data flags are properly set in the EDD. Once review is complete and the EDD passes a final check using an EQUIS Data Processor program, the files are uploaded into an EQUIS database for the project where data can be provided to the Statistician for use in ProUCL. Ultimately the database is exported to Manages, Public Service Company of Colorado's (PSCo) chosen database, and delivered to the PSCo Project Manager.

## 5.0 Water Levels and Flow Direction

Water levels were measured in the five site monitoring wells between fourth quarter 2015 and third quarter 2017. Water levels are provided in **Table 2** and displayed graphically in **Figure 3**. A groundwater contour map is provided for August 2016 only (**Appendix A**) to illustrate the groundwater well MW-13, identified as the background well, is located upgradient of the CCR units. Groundwater flow under the impoundments between December 2015 and July 2017 was generally to the east. The contour map (**Appendix A**) and **Figure 3** graph confirm that monitoring wells MW-7 and MW-13 are located upgradient of the impoundments. Of these two, well MW-13 has been identified as the background well and water quality from MW-13 has been used to select the appropriate statistical method to evaluate groundwater data for the CCR management area.

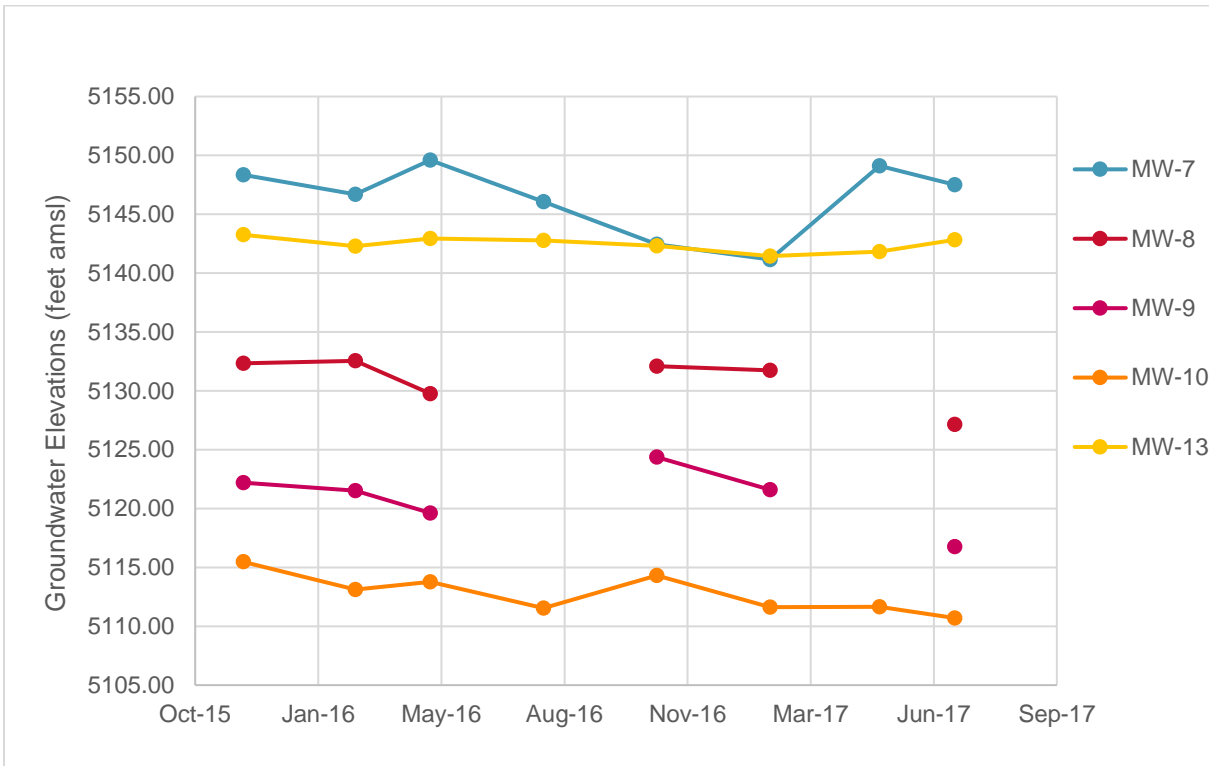




**Table 2. Groundwater elevations in monitoring wells at Cherokee Station**

Site	Well ID	Water Elevation (ft amsl)								Casing Elevation (ft amsl)
		December 2015	March 2016	May 2016	August 2016	November 2016	February 2017	May 2017	July 2017	
Cherokee	MW-7	5148.36	5146.68	5149.60	5146.06	5142.44	5141.16	5149.10	5147.51	5153.86
Cherokee	MW-8	5132.34	5132.55	5129.77	Dry*	5132.10	5131.74	Dry*	5127.16	5140.64
Cherokee	MW-9	5122.20	5121.52	5119.63	Dry*	5124.37	5121.61	Dry*	5116.76	5141.26
Cherokee	MW-10	5115.47	5113.13	5113.76	5111.54	5114.31	5111.63	5111.66	5110.70	5140.88
Cherokee	MW-13	5143.26	5142.28	5142.94	5142.79	5142.32	5141.45	5141.84	5142.83	5174.50

\*East CCR Impoundment had been dredged and drained prior to the sample event



**Figure 3. Groundwater elevations at wells around the impoundments observed each quarter.**

## 6.0 Evaluation of Background Water Quality Data

### 6.1 Constituents

Laboratory reports from the eight background sample events for well MW-13 are provided in **Appendix B**. The statistical analyses detailed in the below sections pertain to samples collected only from background monitoring well MW-13 between December 9, 2015 and July 17, 2017.

Eight groundwater sampling events occurred between December 17, 2015 and July 10, 2017 and samples were analyzed for the constituents listed in Appendix III and IV of the CCR Rule and for certain physical parameters. Only non-filtered Appendix III and IV sample results were utilized for the statistical analysis. Some constituents (total suspended solids and temperature) not listed on Appendix III or IV were analyzed to help provide context to observed patterns for Appendix III and IV constituents. For example, their results may determine if there are possible conditions that might impact the reliability of the data. Reporting units, number of observations, number of non-detects (NDs), and percentage of NDs below detection limits (BDL) for each constituent are listed in **Table 3**.

Statistical analysis was performed and the data was analyzed for outliers, data distribution, and trends.

Table 3. Preliminary data analysis					
Constituent	CAS Number	Units	No. Observations	No. NDs	% NDs
Antimony	7440-36-0	mg/l	8	7	87.5
Arsenic	7440-38-2	mg/l	8	0	0
Barium	7440-39-3	mg/l	8	0	0
Beryllium	7440-41-7	mg/l	8	6	75
Boron	7440-42-8	mg/l	8	0	0
Cadmium	7440-43-9	mg/l	8	8	100
Calcium	7440-70-2	mg/l	8	0	0
Chloride (as Cl)	16887-00-6	mg/l	8	0	0
Chromium, Total	7440-47-3	mg/l	8	2	25
Cobalt	7440-48-4	mg/l	8	0	0
Fluoride	16984-48-8	mg/l	8	0	0
Lead	7439-92-1	mg/l	8	5	62.5
Lithium	7439-93-2	mg/l	8	1	12.5
Mercury	7439-97-6	mg/l	8	8	100
Molybdenum	7439-98-7	mg/l	8	0	0
Radium-226-228		pci/l	8	0	0
Selenium	7782-49-2	mg/l	8	0	0
Sulfate (as SO <sub>4</sub> )	14808-79-8	mg/l	8	0	0
Temperature	TEMP	deg c	8	0	0
Thallium	7440-28-0	mg/l	8	8	100
Total Dissolved Solids	TDS	mg/l	8	0	0
Total Suspended Solids	TSS	mg/l	8	2	25

## 6.2 Outliers

Outliers are values that are not representative of the population from which they are sampled. The data set was screened for outliers using the Dixon's Outlier Test which is suitable for data sets containing less than 25 samples. The outlier test was conducted using a significance of 1 percent. For those constituents which had NDs, the NDs were removed prior to testing for outliers. Statistical outliers are listed in **Table 4**.



Table 4. Dixon's Outlier Test results						
Constituent	Unit	Mean	Standard Deviation	No. of Observation	No. of NDs	Outliers - Tests conducted at the 1% level of significance
Cobalt	mg/l	0.0004	0.0002	8	0	0.001
Chromium, Total	mg/l	0.002	0.002	8	2	0.006

Cobalt and total chromium had statistical outliers, both of which were identified as the highest values in the data set. Quality control conducted on the sampling protocols and laboratory results did not indicate reasons for the noted concentration of the outliers on the dates they were sampled. No unusual weather or anthropogenic activity occurred which could explain the higher concentrations. As the sample size is very small from a statistical perspective, the variability in the concentrations of these constituents will change as additional samples are obtained. The sample's variability for each constituent will approach the true underlying variability of concentrations in groundwater in the vicinity of the background well with the increasing number of samples. Values considered as potential outliers when only eight samples are available may no longer be considered outliers after 20 or more samples have been obtained. For the purpose of estimating background field conditions, all values will be used. The distributional patterns for these constituents and physical parameters will continue to be monitored as sampling events are added to the background.

### 6.3 Data Distribution

Groundwater data was fitted to known distribution models using Goodness-of-Fit (GOF) tests incorporated in ProUCL. For data sets comprised of 50 or fewer samples, ProUCL's GOF module incorporates the Shapiro-Wilk to determine normal or lognormal distribution and Anderson-Darling to determine gamma distribution. Note that ProUCL does not provide GOF results for data sets with less than three detected values due to insufficient data. For purposes of estimating background concentration levels, these data sets will be treated under nonparametric distribution assumptions with the maximum detected value chosen to represent the background concentration levels until more data can be collected.

Cobalt, fluoride, pH, radium-226/228, and sulfate (as SO<sub>4</sub>) were found to have a nonparametric fit to their respective data sets. Antimony, beryllium, cadmium, mercury, and thallium, due to less than three detected values, will be treated under nonparametric distribution assumptions. Additional sampling rounds are needed in order to determine if these constituents' data sets are better described using parametric distributions such as normal, lognormal, or gamma. All remaining constituents have a parametric distribution.

### 6.4 Serial Correlation

Sources for serial correlation in groundwater samples can be due to temporal effects (i.e., autocorrelation) or seasonal effects (i.e., seasonality). Part §257.93(g)(6) of the CCR Rule requires that if necessary, the statistical method must include procedures to control or correct for seasonal as well as temporal correlation in the data.

### 6.4.1 Autocorrelation

Autocorrelation occurs when measurements collected at different points in time correlate with one another. A minimum of at least 50 samples are recommended to test for autocorrelation. Constituents will be analyzed for autocorrelation as additional sampling is conducted in order to determine if samples are autocorrelated.

### 6.4.2 Seasonality

Constituents in groundwater at background well locations may experience predictable recurring increases and decreases in concentrations, termed seasonality. The small data set, 8 samples total (2 winter, 3 spring, 2 summer, 1 fall), does not allow for accurate statistical analysis of seasonality. A minimum of 8 samples per season (winter, spring, summer, and fall) is required to test for seasonal differences but at least 20 samples per season are recommended in order to deseasonalize the data. Constituents will be analyzed for seasonality using the Kruskal-Wallis, ANOVA and Log ANOVA tests as additional sampling is conducted in order to determine if samples are affected by seasonality.

## 6.5 Trends

A key assumption regarding background is constituent concentrations in groundwater should demonstrate stationary conditions through time, free of any trends. Constituents which follow a parametric distribution were analyzed for trends within the data set using a Maximum Likelihood Estimate (MLE) regression. For those that showed statistically significant upwards or downwards trends, trends were checked against results using piecewise linear-linear and a piecewise linear-linear-linear analyses as a visual aid. The linear-linear regression assumes and identifies one structural break within the time series, and the linear-linear-linear regression assumes two structural breaks within the time series.

The Mann-Kendall was used to analyze linear trends within data sets that do not adhere to a specific distribution model (i.e., nonparametric).

The MLE can be applied to data sets that can be fitted to a specific distribution model, do not demonstrate seasonality and contain NDs. MLE results for those constituents or physical parameters with sufficient number of detected values are depicted in **Table 5**.



Table 5. Maximum Likelihood Estimate (MLE) Regression							
Parameter	Unit	N	No. BDL	% BDL	Slope	P-value	Trend
<b>Appendix III Constituents</b>							
Boron	mg/l	8	0	0	-0.0009	<0.0001	↓
Calcium	mg/l	8	0	0	-0.0001	0.6996	↔
Chloride (as Cl)	mg/l	8	0	0	-0.0008	<0.0001	↓
Total Dissolved Solids	mg/l	8	0	0	-0.0003	0.1319	↔
<b>Appendix IV Constituents</b>							
Arsenic	mg/l	8	0	0	0.0009	0.0001	↑
Barium	mg/l	8	0	0	-0.0001	0.8249	↔
Chromium, Total	mg/l	8	2	25	0.0034	0.0308	↑
Lithium	mg/l	8	1	12.5	-0.0009	0.8090	↔
Molybdenum	mg/l	8	0	0	-0.0001	0.7305	↔
Selenium	mg/l	8	0	0	-0.0013	0.0002	↓
<b>Physical Parameters</b>							
Total Suspended Solids	mg/l	8	2	25	0.0047	0.0266	↑
Temperature	deg c	8	0	0	0.0001	0.1212	↔

The Mann-Kendall test is suitable for data series with no discernable distributions, no seasonality, and only one value for the MDL. Mann-Kendall results for those constituents with sufficient number of detected values are depicted in **Table 6**.

Table 6. Mann-Kendall							
Parameter	Unit	N	No. BDL	% BDL	Standard Deviation	P-value	Trend
<b>Appendix III Constituents</b>							
Fluoride	mg/l	8	0	0	0.1280	0.0310	↔
pH	su	8	0	0	0.1720	0.1400	↔
Sulfate (as SO <sub>4</sub> )	mg/l	8	0	0	166.9000	0.2590	↔
<b>Appendix IV Constituents</b>							
Cobalt	mg/l	8	0	0	0.0047	0.0630	↔
Radium-226/228	pci/l	8	0	0	0.9960	0.5000	↔

Boron, chloride (as Cl), and selenium show a decreasing trend on the MLE regression. A review of the piecewise trend analyses did not corroborate the MLE downward trends. Based on lack of correlation between trend tests, small sample size (8), and the condensed range of the data, the predicted MLE regression of a decreasing trend is considered preliminary and requires further statistical analysis with a larger data set.



The MLE regression for total suspended solids, arsenic, and total chromium depicts an increasing trend. The piecewise linear-linear regression also shows an increasing trend for arsenic, but not the piecewise linear-linear-linear regression. The other trend analyses do not show any additional trends. Based on lack of correlation between trend tests, the small sample size (8) and condensed range of data, the predicted MLE regression trends is considered preliminary and requires further statistical analysis with a larger data set.

## 6.6 Summary of Statistical Analysis

A separate Data Management and Statistical Procedures Plan (HDR, 2018) has been prepared, which presents the data management, data validation, and statistical procedures for evaluating data to select statistical method(s) required for evaluating groundwater monitoring data, as required by the CCR Rule. Groundwater monitoring data from the detection monitoring event has been evaluated in accordance with the procedures presented in the Statistical Procedures Plan.

Based on the small sample size, additional sampling is necessary in order to determine the validity of outliers, whether parametric or nonparametric distributions best explain the data sets, and if samples are affected by trends. A summary of statistical results by constituent is depicted in **Table 7**.

<b>Table 7. Summary of statistical results by constituent</b>			
<b>Parameter</b>	<b>Outliers</b>	<b>Nonparametric Data Distribution</b>	<b>Trends</b>
Arsenic			✓
Boron			✓
Chloride (as Cl)			✓
Chromium, Total	✓		✓
Cobalt	✓	✓	
Fluoride		✓	
Lithium			
Molybdenum			
pH		✓	
Radium-226/228		✓	
Selenium			✓
Sulfate (as SO4)		✓	
Total Suspended Solids			✓

✓Constituent was flagged during statistical analysis

## 6.7 Background Threshold Values

For the purpose of estimating background threshold values (BTVs) to represent background concentration levels and for future use in evaluating whether samples selected from downgradient wells exhibit statistically significant increases (SSIs) during detection monitoring, all eight samples per constituent from MW-13 were used.

The BTVs for the Cherokee site are the upper prediction limit (UPL) values from the background data. Upper Prediction Limits are one of the statistical methods specified under 257.93(f)(3). The details as to which UPL formula was used per constituent are provided in the Data Management and Statistical Procedures Plan (HDR, 2018). The test significance level per constituent has been estimated such that the cumulative false positive rate over all constituent/well pair comparisons is approximately 10 percent. COIs sampled from the downgradient wells during the detection monitoring round are compared to their respective BTVs. If the concentration from a COI is higher than its BTV, then the sample can be considered an SSI. Note that for pH, both the UPL and the lower prediction limit (LPL) are of interest as pH values outside the prediction interval at the downgradient wells can be considered statistically significant.

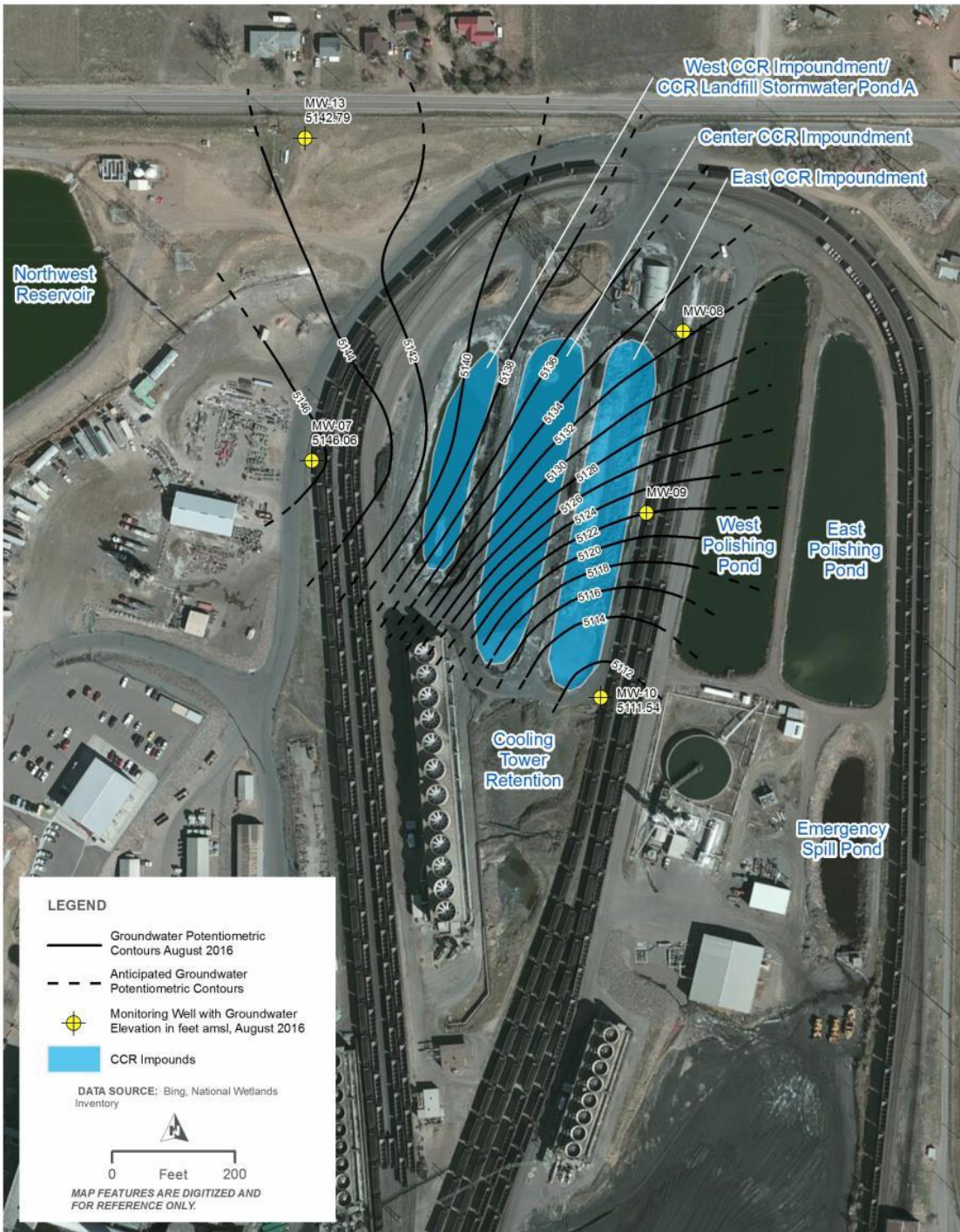
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## **Appendix A**

### **Groundwater Potentiometric Map**



**CHEROKEE POWER STATION**  
ADAMS COUNTY, CO

## **Appendix B**

### **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: 280-77744-1

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:  
1/11/2016 9:36:02 AM

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# Definitions/Glossary

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

TestAmerica Job ID: 280-77744-1

## 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.
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.

### 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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-77744-1

**Job ID: 280-77744-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-77744-1**

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

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

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

### **RECEIPT**

The samples were received on 12/9/2015 at 2:00 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.8° C and 5.4° C.

The sample collection date and times are not listed on the COC. The collection information was logged per the container labels.

One 500-mL container was received without a sample ID. The container was logged as sample 280-77744-2, per the collection time listed on the container. All other volume was accounted for.

### **TOTAL RECOVERABLE METALS (ICPMS)**

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 12/15/2015 and analyzed on 12/16/2015 and 12/21/2015.

Calcium failed the recovery criteria high for the MS of sample MW-8 (280-77744-1) in batch 240-211893. Boron failed the recovery criteria high for the MSD of sample MW-8 (280-77744-1) in batch 240-211893. 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-8 (280-77744-1)[50X], MW-9 (280-77744-2)[20X], MW-10 (280-77744-3)[10X], MW-8D (280-77744-4)[50X] and MW-13 (280-77744-6)[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.

### **TOTAL MERCURY**

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 12/15/2015.

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

### **TOTAL DISSOLVED SOLIDS**

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 12/11/2015.

# Case Narrative

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

TestAmerica Job ID: 280-77744-1

## Job ID: 280-77744-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Constant weight was not achieved after 4 drying cycles for sample MW-13 (280-77744-6).

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 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 12/14/2015 and 12/16/2015.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample MW-8 (280-77744-1). Sample non-homogeneity is suspected. Both the parent sample and the duplicate were below the reporting limit. As such, the %RPD is not accurately quantifiable.

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

### CORROSIVITY (PH)

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 12/11/2015.

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

### ANIONS (28 DAYS)

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/24/2015 and 12/25/2015.

Fluoride exceeded the RPD limit for the duplicate of sample 280-78290-4. Sample non-homogeneity is suspected.

Samples MW-8 (280-77744-1)[10X], MW-9 (280-77744-2)[10X], MW-10 (280-77744-3)[10X], MW-8D (280-77744-4)[10X] and MW-13 (280-77744-6)[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-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 12/15/2015 and analyzed on 01/06/2016.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5), MW-13 (280-77744-6).

The following sample was prepared at a reduced aliquot because the sample bottle was not completely full: MW-10 (280-77744-3).

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

### RADIUM-228

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 12/15/2015 and analyzed on 01/05/2016.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5), MW-13 (280-77744-6).

The following sample was prepared at a reduced aliquot because the sample bottle was not completely full: MW-10 (280-77744-3).



# Case Narrative

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

TestAmerica Job ID: 280-77744-1

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## Job ID: 280-77744-1 (Continued)

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### 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/RADIUM-228 (GFPC)

Samples MW-8 (280-77744-1), MW-9 (280-77744-2), MW-10 (280-77744-3), MW-8D (280-77744-4), MW-8EB1 (280-77744-5) and MW-13 (280-77744-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 01/07/2016.

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

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# Detection Summary

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

TestAmerica Job ID: 280-77744-1

## Client Sample ID: MW-8

## Lab Sample ID: 280-77744-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00055	J	0.0020	0.00016	mg/L	1		6020A	Total
Arsenic	0.0017	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.033		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00029	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	4.4		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0013		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	350		1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.0044		0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00016	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.10		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.15		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.021		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
Thallium	0.00020	J	0.0010	0.000074	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.85	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.4	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	450		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.8		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1500		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9

## Lab Sample ID: 280-77744-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0014	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0026	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.032		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00054	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	3.1		0.40	0.22	mg/L	20		6020A	Total Recoverable
Cadmium	0.0011		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	210		1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.00060	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.0010		0.0010	0.00011	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: 280-77744-1

## Client Sample ID: MW-9 (Continued)

## Lab Sample ID: 280-77744-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	0.077		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.039		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0093		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
Thallium	0.00017	J	0.0010	0.000074	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.73	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.5	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	270		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	850		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1900		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 280-77744-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00099	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0081		0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.037		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00029	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	1.0		0.20	0.11	mg/L	10		6020A	Total Recoverable
Cadmium	0.00015	J	0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.0020		0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.00061	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lithium	0.025		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.028		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0061		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	9.96	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.5	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	440		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	790		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2000		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.8		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-8D

## Lab Sample ID: 280-77744-4

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: 280-77744-1

## Client Sample ID: MW-8D (Continued)

## Lab Sample ID: 280-77744-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00030	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0017	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.033		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00026	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	4.8		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0011		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	370		1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.0046		0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lithium	0.10		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.15		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.020		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.80	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.5	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	430		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.8		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1400		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-8EB1

## Lab Sample ID: 280-77744-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Beryllium	0.00015	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Cobalt	0.000024	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	5.89	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.7	HF	1.00	1.00	Degrees C	1		9040B	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-77744-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00016	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.00053	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.097		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.000097	J	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	0.82		0.10	0.055	mg/L	5		6020A	Total Recoverable
Calcium	160		1.0	0.24	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: 280-77744-1

**Client Sample ID: MW-13 (Continued)**

**Lab Sample ID: 280-77744-6**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chromium	0.00098	J	0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.00027	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00015	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.040		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0027	J	0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0053		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.58	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.5	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	220		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	160		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	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: 280-77744-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-77744-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-77744-1	MW-8	Ground Water	12/08/15 13:00	12/09/15 14:00
280-77744-2	MW-9	Ground Water	12/08/15 15:06	12/09/15 14:00
280-77744-3	MW-10	Ground Water	12/08/15 08:55	12/09/15 14:00
280-77744-4	MW-8D	Water	12/08/15 13:00	12/09/15 14:00
280-77744-5	MW-8EB1	Water	12/08/15 13:00	12/09/15 14:00
280-77744-6	MW-13	Water	12/09/15 10:00	12/09/15 14:00

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# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00055	J	0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:06	1
Arsenic	0.0017	J	0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:06	1
Barium	0.033		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:06	1
Beryllium	0.00029	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:06	1
Boron	4.4		1.0	0.55	mg/L		12/15/15 11:56	12/21/15 15:04	50
Cadmium	0.0013		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:06	1
Calcium	350		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:06	1
Chromium	ND		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:06	1
Cobalt	0.0044		0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:06	1
Lead	0.00016	J	0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:06	1
Lithium	0.10		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:06	1
Molybdenum	0.15		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:06	1
Selenium	0.021		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:06	1
Thallium	0.00020	J	0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:06	1

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0014	J	0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:26	1
Arsenic	0.0026	J	0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:26	1
Barium	0.032		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:26	1
Beryllium	0.00054	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:26	1
Boron	3.1		0.40	0.22	mg/L		12/15/15 11:56	12/21/15 15:20	20
Cadmium	0.0011		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:26	1
Calcium	210		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:26	1
Chromium	ND		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:26	1
Cobalt	0.00060	J	0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:26	1
Lead	0.0010		0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:26	1
Lithium	0.077		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:26	1
Molybdenum	0.039		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:26	1
Selenium	0.0093		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:26	1
Thallium	0.00017	J	0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:26	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00099	J	0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:30	1
Arsenic	0.0081		0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:30	1
Barium	0.037		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:30	1
Beryllium	0.00029	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:30	1
Boron	1.0		0.20	0.11	mg/L		12/15/15 11:56	12/21/15 15:24	10
Cadmium	0.00015	J	0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:30	1
Calcium	300		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:30	1
Chromium	0.0020		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:30	1
Cobalt	0.00061	J	0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:30	1
Lead	ND		0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:30	1
Lithium	0.025		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:30	1
Molybdenum	0.028		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:30	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.0061		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:30	1
Thallium	ND		0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:30	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00030	J	0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:34	1
Arsenic	0.0017	J	0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:34	1
Barium	0.033		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:34	1
Beryllium	0.00026	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:34	1
Boron	4.8		1.0	0.55	mg/L		12/15/15 11:56	12/21/15 15:28	50
Cadmium	0.0011		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:34	1
Calcium	370		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:34	1
Chromium	ND		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:34	1
Cobalt	0.0046		0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:34	1
Lead	ND		0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:34	1
Lithium	0.10		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:34	1
Molybdenum	0.15		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:34	1
Selenium	0.020		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:34	1
Thallium	ND		0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:34	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:46	1
Arsenic	ND		0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:46	1
Barium	ND		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:46	1
Beryllium	0.00015	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:46	1
Boron	ND		0.020	0.011	mg/L		12/15/15 11:56	12/21/15 15:32	1
Cadmium	ND		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:46	1
Calcium	ND		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:46	1
Chromium	ND		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:46	1
Cobalt	0.000024	J	0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:46	1
Lead	ND		0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:46	1
Lithium	ND		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:46	1
Molybdenum	ND		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:46	1
Selenium	ND		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:46	1
Thallium	ND		0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:46	1

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00016	J	0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 10:50	1
Arsenic	0.00053	J	0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 10:50	1
Barium	0.097		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 10:50	1
Beryllium	0.000097	J	0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 10:50	1
Boron	0.82		0.10	0.055	mg/L		12/15/15 11:56	12/21/15 15:44	5

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 10:50	1
Calcium	160		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 10:50	1
Chromium	0.00098	J	0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 10:50	1
Cobalt	0.00027	J	0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 10:50	1
Lead	0.00015	J	0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 10:50	1
Lithium	0.040		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 10:50	1
Molybdenum	0.0027	J	0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 10:50	1
Selenium	0.0053		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 10:50	1
Thallium	ND		0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 10:50	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:10	1

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:17	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:20	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:22	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:24	1

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 16:27	1

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

## General Chemistry

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.85	HF	0.100	0.100	SU			12/11/15 23:32	1
Temperature	23.4	HF	1.00	1.00	Degrees C			12/11/15 23:32	1
Chloride	450		30	2.5	mg/L			12/24/15 23:58	10
Fluoride	1.8		0.50	0.060	mg/L			12/24/15 23:41	1
Sulfate	1500		50	2.3	mg/L			12/24/15 23:58	10
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			12/11/15 16:44	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			12/14/15 12:31	1

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.73	HF	0.100	0.100	SU			12/11/15 23:18	1
Temperature	23.5	HF	1.00	1.00	Degrees C			12/11/15 23:18	1
Chloride	270		30	2.5	mg/L			12/25/15 01:09	10
Fluoride	2.5		0.50	0.060	mg/L			12/25/15 00:51	1
Sulfate	850		50	2.3	mg/L			12/25/15 01:09	10
Total Dissolved Solids (TDS)	1900		10	4.7	mg/L			12/11/15 16:44	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			12/14/15 12:31	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	9.96	HF	0.100	0.100	SU			12/11/15 23:28	1
Temperature	23.5	HF	1.00	1.00	Degrees C			12/11/15 23:28	1
Chloride	440		30	2.5	mg/L			12/25/15 01:45	10
Fluoride	2.3		0.50	0.060	mg/L			12/25/15 01:27	1
Sulfate	790		50	2.3	mg/L			12/25/15 01:45	10
Total Dissolved Solids (TDS)	2000		10	4.7	mg/L			12/11/15 16:44	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			12/14/15 12:31	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.80	HF	0.100	0.100	SU			12/11/15 23:23	1
Temperature	23.5	HF	1.00	1.00	Degrees C			12/11/15 23:23	1
Chloride	430		30	2.5	mg/L			12/25/15 02:20	10
Fluoride	1.8		0.50	0.060	mg/L			12/25/15 02:02	1
Sulfate	1400		50	2.3	mg/L			12/25/15 02:20	10
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			12/11/15 16:44	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			12/14/15 12:31	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.89	HF	0.100	0.100	SU			12/11/15 23:07	1
Temperature	23.7	HF	1.00	1.00	Degrees C			12/11/15 23:07	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

## General Chemistry (Continued)

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			12/25/15 02:38	1
Fluoride	ND		0.50	0.060	mg/L			12/25/15 02:38	1
Sulfate	ND		5.0	0.23	mg/L			12/25/15 02:38	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			12/11/15 16:44	1
Total Suspended Solids	ND		4.0	1.1	mg/L			12/14/15 12:31	1

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.58	HF	0.100	0.100	SU			12/11/15 23:12	1
Temperature	23.5	HF	1.00	1.00	Degrees C			12/11/15 23:12	1
Chloride	220		15	1.3	mg/L			12/25/15 03:13	5
Fluoride	1.0		0.50	0.060	mg/L			12/25/15 02:55	1
Sulfate	160		25	1.2	mg/L			12/25/15 03:13	5
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L			12/11/15 16:44	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			12/16/15 15:32	1

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

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.265		0.145	0.147	1.00	0.200	pCi/L	12/15/15 12:45	01/06/16 07:16	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	90.7		40 - 110					12/15/15 12:45	01/06/16 07:16	1

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0471	U	0.111	0.111	1.00	0.198	pCi/L	12/15/15 12:45	01/06/16 07:16	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	83.5		40 - 110					12/15/15 12:45	01/06/16 07:16	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.218		0.128	0.129	1.00	0.171	pCi/L	12/15/15 12:45	01/06/16 07:17	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.5		40 - 110	12/15/15 12:45	01/06/16 07:17	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.186		0.124	0.125	1.00	0.176	pCi/L	12/15/15 12:45	01/06/16 07:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.8		40 - 110	12/15/15 12:45	01/06/16 07:17	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.111	U	0.111	0.112	1.00	0.176	pCi/L	12/15/15 12:45	01/06/16 07:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		40 - 110	12/15/15 12:45	01/06/16 07:17	1

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.255	U	0.185	0.187	1.00	0.285	pCi/L	12/15/15 12:45	01/06/16 07:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.9		40 - 110	12/15/15 12:45	01/06/16 07:17	1

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

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.287	U	0.372	0.373	1.00	0.618	pCi/L	12/15/15 16:20	01/05/16 17:07	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.7		40 - 110	12/15/15 16:20	01/05/16 17:07	1
Y Carrier	77.4		40 - 110	12/15/15 16:20	01/05/16 17:07	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.383	U	0.264	0.267	1.00	0.410	pCi/L	12/15/15 16:20	01/05/16 13:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		40 - 110					12/15/15 16:20	01/05/16 13:40	1
Y Carrier	81.5		40 - 110					12/15/15 16:20	01/05/16 13:40	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.372	U	0.251	0.253	1.00	0.388	pCi/L	12/15/15 16:20	01/05/16 13:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.5		40 - 110					12/15/15 16:20	01/05/16 13:40	1
Y Carrier	84.5		40 - 110					12/15/15 16:20	01/05/16 13:40	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.304	U	0.266	0.268	1.00	0.426	pCi/L	12/15/15 16:20	01/05/16 13:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.8		40 - 110					12/15/15 16:20	01/05/16 13:40	1
Y Carrier	69.2		40 - 110					12/15/15 16:20	01/05/16 13:40	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.102	U	0.255	0.255	1.00	0.438	pCi/L	12/15/15 16:20	01/05/16 13:40	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	93.9		40 - 110					12/15/15 16:20	01/05/16 13:40	1
Y Carrier	75.1		40 - 110					12/15/15 16:20	01/05/16 13:40	1

**Client Sample ID: MW-13**  
**Date Collected: 12/09/15 10:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.377	U	0.293	0.296	1.00	0.464	pCi/L	12/15/15 16:20	01/05/16 13:44	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.9		40 - 110	12/15/15 16:20	01/05/16 13:44	1
Y Carrier	72.9		40 - 110	12/15/15 16:20	01/05/16 13:44	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.551	U	0.399	0.401	5.00	0.618	pCi/L		01/07/16 18:07	1

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.430		0.287	0.289	5.00	0.410	pCi/L		01/07/16 18:07	1

**Client Sample ID: MW-10**  
**Date Collected: 12/08/15 08:55**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.590		0.281	0.284	5.00	0.388	pCi/L		01/07/16 18:07	1

**Client Sample ID: MW-8D**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.490		0.294	0.296	5.00	0.426	pCi/L		01/07/16 18:07	1

**Client Sample ID: MW-8EB1**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.214	U	0.278	0.278	5.00	0.438	pCi/L		01/07/16 18:07	1



# Client Sample Results

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

TestAmerica Job ID: 280-77744-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: MW-13  
Date Collected: 12/09/15 10:00  
Date Received: 12/09/15 14:00

Lab Sample ID: 280-77744-6  
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.632		0.347	0.350	5.00	0.464	pCi/L		01/07/16 18:07	1

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

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Lab Sample ID: MB 240-210890/1-A**  
**Matrix: Water**  
**Analysis Batch: 211279**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		12/15/15 11:56	12/16/15 09:59	1
Arsenic	ND		0.0050	0.00049	mg/L		12/15/15 11:56	12/16/15 09:59	1
Barium	ND		0.0050	0.0011	mg/L		12/15/15 11:56	12/16/15 09:59	1
Beryllium	ND		0.0010	0.000053	mg/L		12/15/15 11:56	12/16/15 09:59	1
Cadmium	ND		0.0010	0.000061	mg/L		12/15/15 11:56	12/16/15 09:59	1
Calcium	ND		1.0	0.24	mg/L		12/15/15 11:56	12/16/15 09:59	1
Chromium	ND		0.0020	0.00060	mg/L		12/15/15 11:56	12/16/15 09:59	1
Cobalt	ND		0.0010	0.000021	mg/L		12/15/15 11:56	12/16/15 09:59	1
Lead	ND		0.0010	0.00011	mg/L		12/15/15 11:56	12/16/15 09:59	1
Lithium	ND		0.0080	0.00029	mg/L		12/15/15 11:56	12/16/15 09:59	1
Molybdenum	ND		0.010	0.00023	mg/L		12/15/15 11:56	12/16/15 09:59	1
Selenium	ND		0.0050	0.00025	mg/L		12/15/15 11:56	12/16/15 09:59	1
Thallium	ND		0.0010	0.000074	mg/L		12/15/15 11:56	12/16/15 09:59	1

**Lab Sample ID: MB 240-210890/1-A**  
**Matrix: Water**  
**Analysis Batch: 211893**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020	0.011	mg/L		12/15/15 11:56	12/21/15 14:56	1

**Lab Sample ID: LCS 240-210890/2-A**  
**Matrix: Water**  
**Analysis Batch: 211279**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.100	0.0983		mg/L		98	80 - 120
Arsenic	1.00	0.967		mg/L		97	80 - 120
Barium	1.00	0.978		mg/L		98	80 - 120
Beryllium	1.00	0.997		mg/L		100	80 - 120
Cadmium	1.00	1.02		mg/L		102	80 - 120
Calcium	10.0	10.8		mg/L		108	80 - 120
Chromium	1.00	0.974		mg/L		97	80 - 120
Cobalt	1.00	0.995		mg/L		100	80 - 120
Lead	1.00	0.986		mg/L		99	80 - 120
Lithium	0.100	0.0993		mg/L		99	80 - 120
Molybdenum	0.100	0.0976		mg/L		98	80 - 120
Selenium	1.00	0.981		mg/L		98	80 - 120
Thallium	0.250	0.246		mg/L		99	80 - 120

**Lab Sample ID: LCS 240-210890/2-A**  
**Matrix: Water**  
**Analysis Batch: 211893**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	0.100	0.102		mg/L		102	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Lab Sample ID: 280-77744-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 211279**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Antimony	0.00055	J	0.100	0.0975		mg/L		97	75 - 125
Arsenic	0.0017	J	1.00	0.993		mg/L		99	75 - 125
Barium	0.033		1.00	1.00		mg/L		97	75 - 125
Beryllium	0.00029	J	1.00	1.06		mg/L		106	75 - 125
Cadmium	0.0013		1.00	0.939		mg/L		94	75 - 125
Calcium	350		10.0	371	4	mg/L		164	75 - 125
Chromium	ND		1.00	0.942		mg/L		94	75 - 125
Cobalt	0.0044		1.00	0.933		mg/L		93	75 - 125
Lead	0.00016	J	1.00	0.919		mg/L		92	75 - 125
Lithium	0.10		0.100	0.192		mg/L		91	75 - 125
Molybdenum	0.15		0.100	0.248		mg/L		102	75 - 125
Selenium	0.021		1.00	1.03		mg/L		101	75 - 125
Thallium	0.00020	J	0.250	0.231		mg/L		92	75 - 125

**Lab Sample ID: 280-77744-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 211893**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Boron	4.4		0.100	4.53	4	mg/L		107	75 - 125

**Lab Sample ID: 280-77744-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 211279**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	0.00055	J	0.100	0.0963		mg/L		96	75 - 125	1	20
Arsenic	0.0017	J	1.00	0.972		mg/L		97	75 - 125	2	20
Barium	0.033		1.00	0.990		mg/L		96	75 - 125	1	20
Beryllium	0.00029	J	1.00	1.04		mg/L		104	75 - 125	2	20
Cadmium	0.0013		1.00	0.930		mg/L		93	75 - 125	1	20
Calcium	350		10.0	363	4	mg/L		83	75 - 125	2	20
Chromium	ND		1.00	0.924		mg/L		92	75 - 125	2	20
Cobalt	0.0044		1.00	0.917		mg/L		91	75 - 125	2	20
Lead	0.00016	J	1.00	0.917		mg/L		92	75 - 125	0	20
Lithium	0.10		0.100	0.188		mg/L		87	75 - 125	2	20
Molybdenum	0.15		0.100	0.246		mg/L		99	75 - 125	1	20
Selenium	0.021		1.00	0.995		mg/L		97	75 - 125	3	20
Thallium	0.00020	J	0.250	0.232		mg/L		93	75 - 125	0	20

**Lab Sample ID: 280-77744-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 211893**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 210890**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Boron	4.4		0.100	4.68	4	mg/L		252	75 - 125	3	20

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-307627/1-A**  
**Matrix: Water**  
**Analysis Batch: 307937**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 307627**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 15:52	1

**Lab Sample ID: LCS 280-307627/2-A**  
**Matrix: Water**  
**Analysis Batch: 307937**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 307627**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	4.74		ug/L		95	84 - 120

**Lab Sample ID: LCSD 280-307627/3-A**  
**Matrix: Water**  
**Analysis Batch: 307937**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 307627**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	5.00	4.75		ug/L		95	84 - 120	0	15

**Lab Sample ID: 280-77744-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 307937**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 307627**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		5.00	4.60		ug/L		92	75 - 125

**Lab Sample ID: 280-77744-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 307937**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 307627**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	ND		5.00	4.53		ug/L		91	75 - 125	2	20

## Method: 9040B - pH

**Lab Sample ID: LCS 280-307538/27**  
**Matrix: Water**  
**Analysis Batch: 307538**

**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	7.060		SU		101	99 - 101

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-308910/6**  
**Matrix: Water**  
**Analysis Batch: 308910**

**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			12/24/15 10:29	1
Fluoride	ND		0.50	0.060	mg/L			12/24/15 10:29	1
Sulfate	ND		5.0	0.23	mg/L			12/24/15 10:29	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

**Lab Sample ID: LCS 280-308910/4**  
**Matrix: Water**  
**Analysis Batch: 308910**

**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	5.13		mg/L		103	90 - 110
Sulfate	100	100		mg/L		100	90 - 110

**Lab Sample ID: LCSD 280-308910/5**  
**Matrix: Water**  
**Analysis Batch: 308910**

**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	5.14		mg/L		103	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

**Lab Sample ID: MRL 280-308910/3**  
**Matrix: Water**  
**Analysis Batch: 308910**

**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	2.50	J	mg/L		100	50 - 150
Fluoride	0.200	0.114	J	mg/L		57	50 - 150
Sulfate	2.50	2.50	J	mg/L		100	50 - 150

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

**Lab Sample ID: MB 280-307521/1**  
**Matrix: Water**  
**Analysis Batch: 307521**

**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			12/11/15 16:44	1

**Lab Sample ID: LCS 280-307521/2**  
**Matrix: Water**  
**Analysis Batch: 307521**

**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: 280-77744-1 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 307521**

**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)	3000		2990		mg/L		1	10

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Lab Sample ID: MB 280-307699/1**  
**Matrix: Water**  
**Analysis Batch: 307699**

**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			12/14/15 12:31	1

**Lab Sample ID: LCS 280-307699/2**  
**Matrix: Water**  
**Analysis Batch: 307699**

**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

**Lab Sample ID: 280-77744-1 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 307699**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	1.6	J	3.60	J F5	mg/L		77	10

**Lab Sample ID: MB 280-307982/2**  
**Matrix: Water**  
**Analysis Batch: 307982**

**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			12/16/15 15:32	1

**Lab Sample ID: LCS 280-307982/1**  
**Matrix: Water**  
**Analysis Batch: 307982**

**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	93.6		mg/L		94	86 - 114

**Lab Sample ID: 280-77744-6 DU**  
**Matrix: Water**  
**Analysis Batch: 307982**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	3.2	J	3.20	J	mg/L		0	10

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

**Lab Sample ID: MB 160-227452/1-A**  
**Matrix: Water**  
**Analysis Batch: 230860**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 227452**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02222	U	0.110	0.110	1.00	0.204	pCi/L	12/15/15 12:45	01/06/16 07:16	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	84.9		40 - 110	12/15/15 12:45	01/06/16 07:16	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

**Lab Sample ID: LCS 160-227452/2-A**  
**Matrix: Water**  
**Analysis Batch: 230860**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 227452**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	
Radium-226	11.2	10.64		1.14	1.00	0.178	pCi/L	95	68 - 137	
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>							
Ba Carrier	108		40 - 110							

**Lab Sample ID: LCSD 160-227452/3-A**  
**Matrix: Water**  
**Analysis Batch: 230860**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 227452**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.2	8.988		0.989	1.00	0.164	pCi/L	81	68 - 137	0.78	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	106		40 - 110								

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

**Lab Sample ID: MB 160-227493/1-A**  
**Matrix: Water**  
**Analysis Batch: 230350**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 227493**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.2129	U	0.227	0.227	1.00	0.370	pCi/L	12/15/15 16:20	01/05/16 13:39	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>							
Ba Carrier	84.9		40 - 110							
Y Carrier	84.9		40 - 110							
								<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
								12/15/15 16:20	01/05/16 13:39	1
								12/15/15 16:20	01/05/16 13:39	1

**Lab Sample ID: LCS 160-227493/2-A**  
**Matrix: Water**  
**Analysis Batch: 230350**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 227493**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	3.17	2.205		0.403	1.00	0.335	pCi/L	70	56 - 140
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>						
Ba Carrier	108		40 - 110						
Y Carrier	75.5		40 - 110						

TestAmerica Denver



# QC Sample Results

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

TestAmerica Job ID: 280-77744-1

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

**Lab Sample ID: LCSD 160-227493/3-A**  
**Matrix: Water**  
**Analysis Batch: 230350**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 227493**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	3.17	2.231		0.428	1.00	0.413	pCi/L	70	56 - 140	0.03	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	106		40 - 110
Y Carrier	78.5		40 - 110

- 1
- 2
- 3
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- 14
- 15

# QC Association Summary

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

TestAmerica Job ID: 280-77744-1

## Metals

### Prep Batch: 210890

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total Recoverable	Ground Water	3005A	
280-77744-1 MS	MW-8	Total Recoverable	Ground Water	3005A	
280-77744-1 MSD	MW-8	Total Recoverable	Ground Water	3005A	
280-77744-2	MW-9	Total Recoverable	Ground Water	3005A	
280-77744-3	MW-10	Total Recoverable	Ground Water	3005A	
280-77744-4	MW-8D	Total Recoverable	Water	3005A	
280-77744-5	MW-8EB1	Total Recoverable	Water	3005A	
280-77744-6	MW-13	Total Recoverable	Water	3005A	
LCS 240-210890/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 240-210890/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 211279

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-1 MS	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-1 MSD	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-2	MW-9	Total Recoverable	Ground Water	6020A	210890
280-77744-3	MW-10	Total Recoverable	Ground Water	6020A	210890
280-77744-4	MW-8D	Total Recoverable	Water	6020A	210890
280-77744-5	MW-8EB1	Total Recoverable	Water	6020A	210890
280-77744-6	MW-13	Total Recoverable	Water	6020A	210890
LCS 240-210890/2-A	Lab Control Sample	Total Recoverable	Water	6020A	210890
MB 240-210890/1-A	Method Blank	Total Recoverable	Water	6020A	210890

### Analysis Batch: 211893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-1 MS	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-1 MSD	MW-8	Total Recoverable	Ground Water	6020A	210890
280-77744-2	MW-9	Total Recoverable	Ground Water	6020A	210890
280-77744-3	MW-10	Total Recoverable	Ground Water	6020A	210890
280-77744-4	MW-8D	Total Recoverable	Water	6020A	210890
280-77744-5	MW-8EB1	Total Recoverable	Water	6020A	210890
280-77744-6	MW-13	Total Recoverable	Water	6020A	210890
LCS 240-210890/2-A	Lab Control Sample	Total Recoverable	Water	6020A	210890
MB 240-210890/1-A	Method Blank	Total Recoverable	Water	6020A	210890

### Prep Batch: 307627

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	7470A	
280-77744-1 MS	MW-8	Total/NA	Ground Water	7470A	
280-77744-1 MSD	MW-8	Total/NA	Ground Water	7470A	
280-77744-2	MW-9	Total/NA	Ground Water	7470A	
280-77744-3	MW-10	Total/NA	Ground Water	7470A	
280-77744-4	MW-8D	Total/NA	Water	7470A	
280-77744-5	MW-8EB1	Total/NA	Water	7470A	
280-77744-6	MW-13	Total/NA	Water	7470A	
LCS 280-307627/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 280-307627/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	
MB 280-307627/1-A	Method Blank	Total/NA	Water	7470A	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-77744-1

## Metals (Continued)

### Analysis Batch: 307937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	7470A	307627
280-77744-1 MS	MW-8	Total/NA	Ground Water	7470A	307627
280-77744-1 MSD	MW-8	Total/NA	Ground Water	7470A	307627
280-77744-2	MW-9	Total/NA	Ground Water	7470A	307627
280-77744-3	MW-10	Total/NA	Ground Water	7470A	307627
280-77744-4	MW-8D	Total/NA	Water	7470A	307627
280-77744-5	MW-8EB1	Total/NA	Water	7470A	307627
280-77744-6	MW-13	Total/NA	Water	7470A	307627
LCS 280-307627/2-A	Lab Control Sample	Total/NA	Water	7470A	307627
LCSD 280-307627/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	307627
MB 280-307627/1-A	Method Blank	Total/NA	Water	7470A	307627

## General Chemistry

### Analysis Batch: 307521

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	SM 2540C	
280-77744-1 DU	MW-8	Total/NA	Ground Water	SM 2540C	
280-77744-2	MW-9	Total/NA	Ground Water	SM 2540C	
280-77744-3	MW-10	Total/NA	Ground Water	SM 2540C	
280-77744-4	MW-8D	Total/NA	Water	SM 2540C	
280-77744-5	MW-8EB1	Total/NA	Water	SM 2540C	
280-77744-6	MW-13	Total/NA	Water	SM 2540C	
LCS 280-307521/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 280-307521/1	Method Blank	Total/NA	Water	SM 2540C	

### Analysis Batch: 307538

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	9040B	
280-77744-2	MW-9	Total/NA	Ground Water	9040B	
280-77744-3	MW-10	Total/NA	Ground Water	9040B	
280-77744-4	MW-8D	Total/NA	Water	9040B	
280-77744-5	MW-8EB1	Total/NA	Water	9040B	
280-77744-6	MW-13	Total/NA	Water	9040B	
LCS 280-307538/27	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 307699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	SM 2540D	
280-77744-1 DU	MW-8	Total/NA	Ground Water	SM 2540D	
280-77744-2	MW-9	Total/NA	Ground Water	SM 2540D	
280-77744-3	MW-10	Total/NA	Ground Water	SM 2540D	
280-77744-4	MW-8D	Total/NA	Water	SM 2540D	
280-77744-5	MW-8EB1	Total/NA	Water	SM 2540D	
LCS 280-307699/2	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 280-307699/1	Method Blank	Total/NA	Water	SM 2540D	

### Analysis Batch: 307982

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-6	MW-13	Total/NA	Water	SM 2540D	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-77744-1

## General Chemistry (Continued)

### Analysis Batch: 307982 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-6 DU	MW-13	Total/NA	Water	SM 2540D	
LCS 280-307982/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 280-307982/2	Method Blank	Total/NA	Water	SM 2540D	

### Analysis Batch: 308910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	9056A	
280-77744-1	MW-8	Total/NA	Ground Water	9056A	
280-77744-2	MW-9	Total/NA	Ground Water	9056A	
280-77744-2	MW-9	Total/NA	Ground Water	9056A	
280-77744-3	MW-10	Total/NA	Ground Water	9056A	
280-77744-3	MW-10	Total/NA	Ground Water	9056A	
280-77744-4	MW-8D	Total/NA	Water	9056A	
280-77744-4	MW-8D	Total/NA	Water	9056A	
280-77744-5	MW-8EB1	Total/NA	Water	9056A	
280-77744-6	MW-13	Total/NA	Water	9056A	
280-77744-6	MW-13	Total/NA	Water	9056A	
LCS 280-308910/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-308910/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 280-308910/6	Method Blank	Total/NA	Water	9056A	
MRL 280-308910/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 227452

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	PrecSep-21	
280-77744-2	MW-9	Total/NA	Ground Water	PrecSep-21	
280-77744-3	MW-10	Total/NA	Ground Water	PrecSep-21	
280-77744-4	MW-8D	Total/NA	Water	PrecSep-21	
280-77744-5	MW-8EB1	Total/NA	Water	PrecSep-21	
280-77744-6	MW-13	Total/NA	Water	PrecSep-21	
LCS 160-227452/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-227452/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-227452/1-A	Method Blank	Total/NA	Water	PrecSep-21	

### Prep Batch: 227493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77744-1	MW-8	Total/NA	Ground Water	PrecSep_0	
280-77744-2	MW-9	Total/NA	Ground Water	PrecSep_0	
280-77744-3	MW-10	Total/NA	Ground Water	PrecSep_0	
280-77744-4	MW-8D	Total/NA	Water	PrecSep_0	
280-77744-5	MW-8EB1	Total/NA	Water	PrecSep_0	
280-77744-6	MW-13	Total/NA	Water	PrecSep_0	
LCS 160-227493/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-227493/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-227493/1-A	Method Blank	Total/NA	Water	PrecSep_0	

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-77744-1

**Client Sample ID: MW-8**  
**Date Collected: 12/08/15 13:00**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-1**  
**Matrix: Ground 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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:06	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	211893	12/21/15 15:04	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:10	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:32	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/24/15 23:41	CML	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	308910	12/24/15 23:58	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307699	12/14/15 12:31	CML	TAL DEN
Total/NA	Prep	PrecSep-21			999.55 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	999.55 mL		230860	01/06/16 07:16	MFM	TAL SL
Total/NA	Prep	PrecSep_0			999.55 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	999.55 mL		230350	01/05/16 17:07	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	RTM	TAL SL

**Client Sample ID: MW-9**  
**Date Collected: 12/08/15 15:06**  
**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-2**  
**Matrix: Ground 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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:26	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	211893	12/21/15 15:20	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:17	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:18	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/25/15 00:51	CML	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	308910	12/25/15 01:09	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307699	12/14/15 12:31	CML	TAL DEN
Total/NA	Prep	PrecSep-21			1000.00 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	1000.00 mL		230860	01/06/16 07:16	MFM	TAL SL
Total/NA	Prep	PrecSep_0			1000.00 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	1000.00 mL		230350	01/05/16 13:40	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	RTM	TAL SL

# Lab Chronicle

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

TestAmerica Job ID: 280-77744-1

**Client Sample ID: MW-10**

**Date Collected: 12/08/15 08:55**

**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-3**

**Matrix: Ground 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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:30	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		10	50 mL	50 mL	211893	12/21/15 15:24	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:20	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:28	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/25/15 01:27	CML	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	308910	12/25/15 01:45	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307699	12/14/15 12:31	CML	TAL DEN
Total/NA	Prep	PrecSep-21			952.74 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	952.74 mL		230860	01/06/16 07:17	MFM	TAL SL
Total/NA	Prep	PrecSep_0			952.74 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	952.74 mL		230350	01/05/16 13:40	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	RTM	TAL SL

**Client Sample ID: MW-8D**

**Date Collected: 12/08/15 13:00**

**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-4**

**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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:34	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	211893	12/21/15 15:28	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:22	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:23	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/25/15 02:02	CML	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	308910	12/25/15 02:20	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307699	12/14/15 12:31	CML	TAL DEN
Total/NA	Prep	PrecSep-21			999.87 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	999.87 mL		230860	01/06/16 07:17	MFM	TAL SL
Total/NA	Prep	PrecSep_0			999.87 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	999.87 mL		230350	01/05/16 13:40	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-77744-1

**Client Sample ID: MW-8EB1**

**Date Collected: 12/08/15 13:00**

**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-5**

**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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:46	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211893	12/21/15 15:32	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:24	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:07	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/25/15 02:38	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307699	12/14/15 12:31	CML	TAL DEN
Total/NA	Prep	PrecSep-21			1000.26 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	1000.26 mL		230860	01/06/16 07:17	MFM	TAL SL
Total/NA	Prep	PrecSep_0			1000.26 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	1000.26 mL		230350	01/05/16 13:40	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	RTM	TAL SL

**Client Sample ID: MW-13**

**Date Collected: 12/09/15 10:00**

**Date Received: 12/09/15 14:00**

**Lab Sample ID: 280-77744-6**

**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	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211279	12/16/15 10:50	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	210890	12/15/15 11:56	WAL	TAL CAN
Total Recoverable	Analysis	6020A		5	50 mL	50 mL	211893	12/21/15 15:44	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307627	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 16:27	CDH	TAL DEN
Total/NA	Analysis	9040B		1			307538	12/11/15 23:12	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308910	12/25/15 02:55	CML	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	308910	12/25/15 03:13	CML	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	307521	12/11/15 16:44	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	307982	12/16/15 15:32	MW1	TAL DEN
Total/NA	Prep	PrecSep-21			1000.31 mL	1.0 g	227452	12/15/15 12:45	CMT	TAL SL
Total/NA	Analysis	9315		1	1000.31 mL		230860	01/06/16 07:17	MFM	TAL SL
Total/NA	Prep	PrecSep_0			1000.31 mL	1.0 g	227493	12/15/15 16:20	CMT	TAL SL
Total/NA	Analysis	9320		1	1000.31 mL		230655	01/05/16 13:44	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			231188	01/07/16 18:07	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



# Certification Summary

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

TestAmerica Job ID: 280-77744-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Ground Water	Mercury
7470A	7470A	Water	Mercury
9040B		Ground Water	Temperature
9040B		Water	Temperature
9056A		Ground Water	Chloride
9056A		Ground Water	Fluoride
9056A		Ground Water	Sulfate
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-26-16 *
Kentucky (WW)	State Program	4	98016	12-31-15 *
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-16
Nevada	State Program	9	OH-000482008A	07-31-16
New Jersey	NELAP	2	OH001	06-30-16
New York	NELAP	2	10975	03-31-16 *
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-16 *
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-16 *
West Virginia DEP	State Program	3	210	12-31-15 *
Wisconsin	State Program	5	999518190	08-31-16

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-16
California	ELAP	9	2886	03-31-16
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-16
Illinois	NELAP	5	003757	11-30-16
Iowa	State Program	7	373	12-01-16

\* Certification renewal pending - certification considered valid.

# Certification Summary

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

TestAmerica Job ID: 280-77744-1

## Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Kansas	NELAP	7	E-10236	01-31-16 *
Kentucky (DW)	State Program	4	90125	12-31-15 *
L-A-B	DoD ELAP		L2305	04-10-16 *
Louisiana	NELAP	6	04080	06-30-16
Louisiana (DW)	NELAP	6	LA160008	12-31-16
Maryland	State Program	3	310	09-30-16
Missouri	State Program	7	780	06-30-16
Nevada	State Program	9	MO000542016-1	07-31-16
New Jersey	NELAP	2	MO002	06-30-16
New York	NELAP	2	11616	03-31-16 *
North Dakota	State Program	8	R207	06-30-16
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-16
Pennsylvania	NELAP	3	68-00540	02-28-16 *
South Carolina	State Program	4	85002001	06-30-16
Texas	NELAP	6	T104704193-15-9	07-31-16
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542015-7	07-31-16
Virginia	NELAP	3	460230	06-14-16
Washington	State Program	10	C592	08-30-16
West Virginia DEP	State Program	3	381	08-31-16

\* Certification renewal pending - certification considered valid.

### Chain of Custody Record



280-77744 Chain of Custody

<b>Client Information</b> Client Contact: Anna Lundin Company: HDR Inc		Sampler: <i>Gracie Kelly</i> Lab PM: Kupper, Stephanie L. Phone: <i>720 853 7275</i> E-Mail: stephanie.kupper@testamericainc.com		COC No: Page <i>1</i> of <i>1</i> Job #:	
Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State, Zip: CO, 80112 Phone: 720-633-2380(Tel) Email: anna.lundin@hdrinc.com		Due Date Requested: TAT Requested (days): Standard PO #: DEN-001 WO #: Project #: 28014371 Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		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 - Na2S2SO3 S - HZSO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
Sample Identification <i>68 12/19/15</i> MW-7 MW-8 MW-9 MW-10 Field Duplicate <i>68 12/19/15</i> MW-8D Equipment <i>68 12/19/15</i> MW-8EB1 MW-13		Matrix (W=water, S=solid, O=waste/oil, I=In-Tissue Acid) Water Water Water Water Water Water Water		Sample Type (C=comp, G=grab) N N N N N N N	
Sample Date <i>12/19/15</i>		Sample Time <i>12/19/15</i>		Field Filtered Sample (Yes or No) N N N N N N N	
Analysis Requested 2540C - Total Dissolved Solids (TDS) Metals - 6020A, 7470A PH - 9040B, Antions - 9056A_28D 2540D - Total Suspended Solids 9315_Ra226, 9320_Ra228		Total Number of Containers 7 7 7 7 7		Special Instructions/Note: refer to PROJECT SETUP	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For Months	
Empty Kit Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR		Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR		Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR	
Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR		Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR		Relinquished by: Tava Kent HDR Date/Time: 12/19/15 1400 Company: HDR	
Custody Seals Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 4.8, 5.4, 10.0 IR#7 DW 12/19/15	



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

**Chain of Custody Record**



THE LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)		Lab PM:	Carrier Tracking No(s):							
Client Contact: Xcel Energy GW CCR Monitoring - Cherokee		Kupper, Stephanie K	280-333209-1							
Shipping/Receiving Company: Xcel Energy CCR - Cherokee Station		E-Mail: stephanie.kupper@testamericainc.com								
TestAmerica Laboratories, Inc.										
Address: 13715 Rider Trail North, Earth City, MO, 63045		COC No: 280-333209-1								
Phone: 314-298-8566 (Tel) 314-298-8757 (Fax)		Page: 1 of 1								
Email:		Job #: 280-77744-1								
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		Preservation Codes:								
Site: Xcel Energy CCR - Cherokee Station		A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2SO3 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:								
Analysis Requested										
Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=soil, O=oil, etc.)	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	Total Number of Containers	Special Instructions/Note:
MW-8 (280-77744-1)	12/8/15	13:00 Mountain	Water	Water			X	X	2	
MW-9 (280-77744-2)	12/8/15	15:06 Mountain	Water	Water			X	X	2	
MW-10 (280-77744-3)	12/8/15	08:55 Mountain	Water	Water			X	X	2	
MW-8D (280-77744-4)	12/8/15	13:00 Mountain	Water	Water			X	X	2	
MW-8EB1 (280-77744-5)	12/8/15	13:00 Mountain	Water	Water			X	X	2	
MW-13 (280-77744-6)	12/9/15	10:00 Mountain	Water	Water			X	X	2	
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)										
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months										
Special Instructions/QC Requirements:										
Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____										
Relinquished by: _____ Date/Time: 12/11/15 08:45 Company TAA										
Relinquished by: _____ Date/Time: _____ Company TAA										
Relinquished by: _____ Date/Time: _____ Company TAA										
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No										
Cooler Temperature(s) °C and Other Remarks:										



Job #(s): \_\_\_\_\_

CUR Form #: 3 8 9

## CONDITION UPON RECEIPT FORM

Client: TA Denver

Quote No: \_\_\_\_\_

COC/RFA No: \_\_\_\_\_



Initiated By: BD Date: 12/2/15 Time: 0900

### Shipping Information

Shipper: FedEx UPS DHL Courier Client Other: \_\_\_\_\_ Multiple Packages: Y N

Shipping # (s):\*

Sample Temperature (s):\*\*

- |                          |           |                          |           |
|--------------------------|-----------|--------------------------|-----------|
| 1. <u>6559 1460 6580</u> | 6. _____  | 1. <u>2.1</u> <u>(Y)</u> | 6. _____  |
| 2. _____                 | 7. _____  | 2. _____                 | 7. _____  |
| 3. _____                 | 8. _____  | 3. _____                 | 8. _____  |
| 4. _____                 | 9. _____  | 4. _____                 | 9. _____  |
| 5. _____                 | 10. _____ | 5. _____                 | 10. _____ |

\*\*Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid; Rad tests- Liquid or Solids; Perchlorate

\*Numbered shipping lines correspond to Numbered Sample Temp lines

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. <u>Y</u> N	Are there custody seals present on the cooler?	8. Y <u>N</u>	Are there custody seals present on bottles?
2. Y <u>N</u> N/A	Do custody seals on cooler appear to be tampered with?	9. Y N <u>N/A</u>	Do custody seals on bottles appear to be tampered with?
3. <u>Y</u> N	Were contents of cooler frisked after opening, but before unpacking?	10. <u>Y</u> N N/A	Was sample received with proper pH <sup>1</sup> ? (If not, make note below)
4. <u>Y</u> N	Sample received with Chain of Custody?	11. Y N <u>N/A</u>	Containers for C-14, H-3 & I-129/131 marked with "Do Not Preserve" label?
5. <u>Y</u> N N/A	Does the Chain of Custody match sample ID's on the container(s)?	12. <u>Y</u> N	Sample received in proper containers?
6. Y <u>N</u>	Was sample received broken?	13. Y N <u>N/A</u>	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)
7. <u>Y</u> N	Is sample volume sufficient for analysis?	14. <u>Y</u> N N/A	Was Internal COC/Workshare received?

<sup>1</sup> For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX, Oil & Grease and soils.

Notes:

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2.31020

<b>Client Information (Sub Contract Lab)</b> Client Contact: Shipping/Receiving Company: TestAmerica Laboratories, Inc. Address: 4101 Shuffel Street NW, City: North Canton State, Zip: OH, 44720 Phone: 330-497-9396(Tel) 330-497-0772(Fax) Email:		Lab PMT: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com Carrier Tracking No(s): COC No: 280-333215.1 Page: Page 1 of 1 Job #: 280-77744-1	
Due Date Requested: 12/30/2015 TAT Requested (days): PO #: WO #: Project #: 28014371 SSOW#:		<b>Analysis Requested</b> 6020A/3005A 14 Metals (Includes B and Ca) - 1/2 - SUB Total Number of Containers:	
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		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 - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
<b>Sample Identification - Client ID (Lab ID)</b>		Special Instructions/Note: C270 <del>5022</del>	
MW-8 (280-77744-1) MW-9 (280-77744-2) MW-10 (280-77744-3) MW-8D (280-77744-4) MW-8EB1 (280-77744-5) MW-13 (280-77744-6)	Sample Date 12/8/15 12/8/15 12/8/15 12/8/15 12/8/15 12/9/15	Sample Time 13:00 Mountain 15:06 Mountain 08:55 Mountain 13:00 Mountain 13:00 Mountain 10:00 Mountain	Sample Type (C=Comp, G=grab) Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=air) Preservation Code Water Water Water Water Water Water
<b>Possible Hazard Identification</b> Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Method of Shipment:	
Relinquished by: [Signature] Date/Time: 12/15/15 9:30 Company: TAD		Received by: [Signature] Date/Time: 12-12-15 9:30 Company: TAD	
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:	



TestAmerica Canton Sample Receipt Form/Narrative  
Canton Facility

Login # : \_\_\_\_\_

Client Denver Site Name \_\_\_\_\_  
Cooler Received on 12-12-15 Opened on 12-14-15  
FedEx: 1<sup>st</sup> Grd  Exp UPS FAS Stetson Client Drop Off TestAmerica Courier Other \_\_\_\_\_

Cooler unpacked by:  
[Signature]

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

TestAmerica Cooler # \_\_\_\_\_ Foam 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
    - IR GUN# 53 (CF +0.1 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
    - IR GUN# 48 (CF -0.3 °C) Observed Cooler Temp. 2.3 °C Corrected Cooler Temp. 2.0 °C
    - IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
    - IR GUN# 8 (CF -0.5 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
  2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1  Yes  No
    - Were custody seals on the outside of the cooler(s) signed & dated?  Yes  No NA
    - Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?  Yes  No
  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. Were sample(s) at the correct pH upon receipt?  Yes  No NA pH Strip Lot# HC559158
  12. Were VOAs on the COC?  Yes  No
  13. Were air bubbles >6 mm in any VOA vials?  Yes  No NA
  14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_  Yes  No
  15. Was a LL Hg or Me Hg trip blank present?  Yes  No
- Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other \_\_\_\_\_  
Concerning \_\_\_\_\_

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. 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)

16. 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: 280-77744-1

**Login Number: 77744**

**List Number: 1**

**Creator: White, Denise E**

**List Source: TestAmerica Denver**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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.	False	No sample date and/or time on COC, logged in per container labels.
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.	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 <math><6\text{mm}</math> (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: 280-77744-1

**Login Number: 77744**  
**List Number: 2**  
**Creator: Daniels, Brian J**

**List Source: TestAmerica St. Louis**  
**List Creation: 12/14/15 11:44 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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	2.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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 <math><6\text{mm}</math> (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: 280-77744-1

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

Matrix: Ground Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-77744-1	MW-8	90.7
280-77744-2	MW-9	83.5
280-77744-3	MW-10	92.5

**Tracer/Carrier Legend**

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-77744-4	MW-8D	92.8
280-77744-5	MW-8EB1	93.9
280-77744-6	MW-13	84.9
LCS 160-227452/2-A	Lab Control Sample	108
LCSD 160-227452/3-A	Lab Control Sample Dup	106
MB 160-227452/1-A	Method Blank	84.9

**Tracer/Carrier Legend**

Ba = Ba Carrier

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

Matrix: Ground Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-77744-1	MW-8	90.7	77.4
280-77744-2	MW-9	83.5	81.5
280-77744-3	MW-10	92.5	84.5

**Tracer/Carrier Legend**

Ba = Ba Carrier

Y = Y Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-77744-4	MW-8D	92.8	69.2
280-77744-5	MW-8EB1	93.9	75.1
280-77744-6	MW-13	84.9	72.9
LCS 160-227493/2-A	Lab Control Sample	108	75.5
LCSD 160-227493/3-A	Lab Control Sample Dup	106	78.5
MB 160-227493/1-A	Method Blank	84.9	84.9

**Tracer/Carrier Legend**

TestAmerica Denver

# Tracer/Carrier Summary

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

TestAmerica Job ID: 280-77744-1

Ba = Ba Carrier  
Y = Y Carrier

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# 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: 280-77947-1

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:  
1/19/2016 10:51:24 AM

Stephanie Kupper, Project Manager I  
(303)736-0182  
[stephanie.kupper@testamericainc.com](mailto:stephanie.kupper@testamericainc.com)

### LINKS

Review your project  
results through  
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Have a Question?



Visit us at:  
[www.testamericainc.com](http://www.testamericainc.com)

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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

TestAmerica Job ID: 280-77947-1

## 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
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-77947-1

**Job ID: 280-77947-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-77947-1**

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 sample was received on 12/11/2015 at 1:30 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1° C.

### **TOTAL RECOVERABLE METALS (ICPMS)**

Sample MW-7 (280-77947-1) was analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 12/17/2015 and 12/21/2015 and analyzed on 12/18/2015, 12/22/2015, 12/23/2015 and 12/29/2015.

Beryllium and Cobalt were detected in method blank MB 240-211228/1-A 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.

Calcium failed the recovery criteria high for the MSD of sample 280-77926-1 in batch 240-211721. 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.

Boron failed the recovery criteria low for the MS of sample 280-77926-1 in batch 240-212003. Boron failed the recovery criteria high for the MSD of sample 280-77926-1 in batch 240-212003. 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.

Sample MW-7 (280-77947-1)[20X] 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.

### **TOTAL MERCURY**

Sample MW-7 (280-77947-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 12/15/2015.

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

### **TOTAL DISSOLVED SOLIDS**

Sample MW-7 (280-77947-1) was analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 12/15/2015.



# Case Narrative

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

TestAmerica Job ID: 280-77947-1

## Job ID: 280-77947-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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

#### **TOTAL SUSPENDED SOLIDS**

Sample MW-7 (280-77947-1) was analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 12/18/2015.

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

#### **CORROSIVITY (PH)**

Sample MW-7 (280-77947-1) was analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 12/16/2015.

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

#### **ANIONS (28 DAYS)**

Sample MW-7 (280-77947-1) was analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/28/2015 and 12/29/2015.

Sample MW-7 (280-77947-1)[5X] 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)**

Sample MW-7 (280-77947-1) was analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 12/21/2015 and analyzed on 01/12/2016.

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

#### **RADIUM-228**

Sample MW-7 (280-77947-1) was analyzed for Radium-228 in accordance with 9320. The samples were prepared on 12/21/2015 and analyzed on 12/24/2015.

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

#### **RADIUM-226/RADIUM-228 (GFPC)**

Sample MW-7 (280-77947-1) was analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 01/18/2016.

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: 280-77947-1

**Client Sample ID: MW-7**

**Lab Sample ID: 280-77947-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00033	J	0.0020	0.00016	mg/L	1		6020A	Total
Arsenic	0.0013	J	0.0050	0.00049	mg/L	1		6020A	Recoverable Total
Barium	0.058		0.0050	0.0011	mg/L	1		6020A	Recoverable Total
Beryllium	0.00013	J B	0.0010	0.000053	mg/L	1		6020A	Recoverable Total
Boron	1.3		0.40	0.22	mg/L	20		6020A	Recoverable Total
Cadmium	0.00011	J	0.0010	0.000061	mg/L	1		6020A	Recoverable Total
Calcium	190		1.0	0.24	mg/L	1		6020A	Recoverable Total
Chromium	0.0018	J	0.0020	0.00060	mg/L	1		6020A	Recoverable Total
Cobalt	0.00028	J B	0.0010	0.000021	mg/L	1		6020A	Recoverable Total
Lead	0.00039	J	0.0010	0.00011	mg/L	1		6020A	Recoverable Total
Lithium	0.044		0.0080	0.00029	mg/L	1		6020A	Recoverable Total
Molybdenum	0.0078	J	0.010	0.00023	mg/L	1		6020A	Recoverable Total
Selenium	0.0094		0.0050	0.00025	mg/L	1		6020A	Recoverable Total
pH adj. to 25 deg C	7.66	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	23.3	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	490		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	450		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1800		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	4.4		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: 280-77947-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-77947-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-77947-1	MW-7	Ground Water	12/11/15 08:20	12/11/15 13:30

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# Client Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00033	J	0.0020	0.00016	mg/L		12/17/15 07:43	12/18/15 15:47	1
Arsenic	0.0013	J	0.0050	0.00049	mg/L		12/21/15 10:26	12/23/15 13:12	1
Barium	0.058		0.0050	0.0011	mg/L		12/17/15 07:43	12/18/15 15:47	1
Beryllium	0.00013	J B	0.0010	0.000053	mg/L		12/17/15 07:43	12/18/15 15:47	1
Boron	1.3		0.40	0.22	mg/L		12/21/15 10:26	12/22/15 13:16	20
Cadmium	0.00011	J	0.0010	0.000061	mg/L		12/17/15 07:43	12/18/15 15:47	1
Calcium	190		1.0	0.24	mg/L		12/17/15 07:43	12/18/15 15:47	1
Chromium	0.0018	J	0.0020	0.00060	mg/L		12/17/15 07:43	12/18/15 15:47	1
Cobalt	0.00028	J B	0.0010	0.000021	mg/L		12/17/15 07:43	12/18/15 15:47	1
Lead	0.00039	J	0.0010	0.00011	mg/L		12/17/15 07:43	12/18/15 15:47	1
Lithium	0.044		0.0080	0.00029	mg/L		12/21/15 10:26	12/29/15 13:45	1
Molybdenum	0.0078	J	0.010	0.00023	mg/L		12/21/15 10:26	12/23/15 13:12	1
Selenium	0.0094		0.0050	0.00025	mg/L		12/17/15 07:43	12/18/15 15:47	1
Thallium	ND		0.0010	0.000074	mg/L		12/17/15 07:43	12/18/15 15:47	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 14:36	1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.66	HF	0.100	0.100	SU			12/16/15 23:32	1
Temperature	23.3	HF	1.00	1.00	Degrees C			12/16/15 23:32	1
Chloride	490		15	1.3	mg/L			12/29/15 19:18	5
Fluoride	1.1		0.50	0.060	mg/L			12/28/15 18:17	1
Sulfate	450		25	1.2	mg/L			12/29/15 19:18	5
Total Dissolved Solids (TDS)	1800		10	4.7	mg/L			12/15/15 18:52	1
Total Suspended Solids	4.4		4.0	1.1	mg/L			12/18/15 16:23	1

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

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.294		0.0792	0.0835	1.00	0.0716	pCi/L	12/21/15 15:19	01/12/16 07:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	75.9		40 - 110					12/21/15 15:19	01/12/16 07:05	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.408	U	0.289	0.291	1.00	0.451	pCi/L	12/21/15 15:19	12/24/15 18:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	75.9		40 - 110					12/21/15 15:19	12/24/15 18:29	1
Y Carrier	92.3		40 - 110					12/21/15 15:19	12/24/15 18:29	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.702</b>		0.299	0.303	5.00	0.451	pCi/L		01/18/16 21:10	1

# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Lab Sample ID: MB 240-211228/1-A**  
**Matrix: Water**  
**Analysis Batch: 211721**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211228**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		12/17/15 07:43	12/18/15 14:40	1
Barium	ND		0.0050	0.0011	mg/L		12/17/15 07:43	12/18/15 14:40	1
Beryllium	0.0000770	J	0.0010	0.000053	mg/L		12/17/15 07:43	12/18/15 14:40	1
Cadmium	ND		0.0010	0.000061	mg/L		12/17/15 07:43	12/18/15 14:40	1
Calcium	ND		1.0	0.24	mg/L		12/17/15 07:43	12/18/15 14:40	1
Chromium	ND		0.0020	0.00060	mg/L		12/17/15 07:43	12/18/15 14:40	1
Cobalt	0.0000220	J	0.0010	0.000021	mg/L		12/17/15 07:43	12/18/15 14:40	1
Lead	ND		0.0010	0.00011	mg/L		12/17/15 07:43	12/18/15 14:40	1
Selenium	ND		0.0050	0.00025	mg/L		12/17/15 07:43	12/18/15 14:40	1
Thallium	ND		0.0010	0.000074	mg/L		12/17/15 07:43	12/18/15 14:40	1

**Lab Sample ID: LCS 240-211228/2-A**  
**Matrix: Water**  
**Analysis Batch: 211721**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211228**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Rec. Limits
Antimony	0.100	0.0826		mg/L		83	80 - 120
Barium	1.00	0.917		mg/L		92	80 - 120
Beryllium	1.00	0.976		mg/L		98	80 - 120
Cadmium	1.00	0.946		mg/L		95	80 - 120
Calcium	10.0	10.1		mg/L		101	80 - 120
Chromium	1.00	0.907		mg/L		91	80 - 120
Cobalt	1.00	0.963		mg/L		96	80 - 120
Lead	1.00	0.987		mg/L		99	80 - 120
Selenium	1.00	0.911		mg/L		91	80 - 120
Thallium	0.250	0.241		mg/L		96	80 - 120

**Lab Sample ID: MB 240-211754/1-A**  
**Matrix: Water**  
**Analysis Batch: 212003**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211754**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		0.0050	0.00049	mg/L		12/21/15 10:26	12/22/15 12:10	1
Boron	ND		0.020	0.011	mg/L		12/21/15 10:26	12/22/15 12:10	1
Lithium	ND		0.0080	0.00029	mg/L		12/21/15 10:26	12/22/15 12:10	1
Molybdenum	ND		0.010	0.00023	mg/L		12/21/15 10:26	12/22/15 12:10	1

**Lab Sample ID: MB 240-211754/1-A**  
**Matrix: Water**  
**Analysis Batch: 212572**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211754**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		0.0080	0.00029	mg/L		12/21/15 10:26	12/29/15 12:41	1



# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Lab Sample ID: LCS 240-211754/2-A**  
**Matrix: Water**  
**Analysis Batch: 212003**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211754**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Arsenic	1.00	0.954		mg/L		95	80 - 120
Boron	0.100	0.0969		mg/L		97	80 - 120
Lithium	0.100	0.0975		mg/L		97	80 - 120
Molybdenum	0.100	0.0961		mg/L		96	80 - 120

**Lab Sample ID: LCS 240-211754/2-A**  
**Matrix: Water**  
**Analysis Batch: 212572**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 211754**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Lithium	0.100	0.0935		mg/L		93	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-307770/1-A**  
**Matrix: Water**  
**Analysis Batch: 307937**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 307770**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		12/15/15 09:50	12/15/15 14:17	1

**Lab Sample ID: LCS 280-307770/2-A**  
**Matrix: Water**  
**Analysis Batch: 307937**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 307770**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	5.00	4.94		ug/L		99	84 - 120

**Lab Sample ID: 280-77947-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 307937**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 307770**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		5.00	4.71		ug/L		94	75 - 125

**Lab Sample ID: 280-77947-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 307937**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 307770**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		5.00	4.54		ug/L		91	75 - 125	4	20

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

## Method: 9040B - pH

Lab Sample ID: LCS 280-308088/27  
 Matrix: Water  
 Analysis Batch: 308088

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	7.050		SU		101	99 - 101

## Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-308992/6  
 Matrix: Water  
 Analysis Batch: 308992

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			12/28/15 12:58	1
Fluoride	ND		0.50	0.060	mg/L			12/28/15 12:58	1
Sulfate	ND		5.0	0.23	mg/L			12/28/15 12:58	1

Lab Sample ID: LCS 280-308992/4  
 Matrix: Water  
 Analysis Batch: 308992

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	96.9		mg/L		97	90 - 110
Fluoride	5.00	5.10		mg/L		102	90 - 110
Sulfate	100	97.3		mg/L		97	90 - 110

Lab Sample ID: LCSD 280-308992/5  
 Matrix: Water  
 Analysis Batch: 308992

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	97.1		mg/L		97	90 - 110	0	10
Fluoride	5.00	5.07		mg/L		101	90 - 110	1	10
Sulfate	100	97.4		mg/L		97	90 - 110	0	10

Lab Sample ID: MRL 280-308992/3  
 Matrix: Water  
 Analysis Batch: 308992

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	2.52	J	mg/L		101	50 - 150
Fluoride	0.200	0.133	J	mg/L		66	50 - 150
Sulfate	2.50	2.60	J	mg/L		104	50 - 150

Lab Sample ID: MB 280-309062/6  
 Matrix: Water  
 Analysis Batch: 309062

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			12/29/15 12:17	1
Sulfate	ND		5.0	0.23	mg/L			12/29/15 12:17	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Lab Sample ID: LCS 280-309062/4**  
**Matrix: Water**  
**Analysis Batch: 309062**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	98.7		mg/L		99	90 - 110
Sulfate	100	99.1		mg/L		99	90 - 110

**Lab Sample ID: LCSD 280-309062/5**  
**Matrix: Water**  
**Analysis Batch: 309062**

**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	98.7		mg/L		99	90 - 110	0	10
Sulfate	100	99.2		mg/L		99	90 - 110	0	10

**Lab Sample ID: MRL 280-309062/3**  
**Matrix: Water**  
**Analysis Batch: 309062**

**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	2.59	J	mg/L		104	50 - 150
Sulfate	2.50	2.71	J	mg/L		109	50 - 150

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

**Lab Sample ID: MB 280-307857/1**  
**Matrix: Water**  
**Analysis Batch: 307857**

**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			12/15/15 18:52	1

**Lab Sample ID: LCS 280-307857/2**  
**Matrix: Water**  
**Analysis Batch: 307857**

**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

**Lab Sample ID: 280-77947-1 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 307857**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	1800		1780		mg/L		0.2	10

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

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

Lab Sample ID: MB 280-308317/2  
Matrix: Water  
Analysis Batch: 308317

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			12/18/15 16:23	1

Lab Sample ID: LCS 280-308317/1  
Matrix: Water  
Analysis Batch: 308317

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	92.0		mg/L		92	86 - 114

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

Lab Sample ID: MB 160-228569/1-A  
Matrix: Water  
Analysis Batch: 231800

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 228569

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03573	U	0.0337	0.0339	1.00	0.0520	pCi/L	12/21/15 15:19	01/12/16 07:04	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.2		40 - 110					12/21/15 15:19	01/12/16 07:04	1

Lab Sample ID: LCS 160-228569/2-A  
Matrix: Water  
Analysis Batch: 231800

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 228569

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	10.40		1.01	1.00	0.0648	pCi/L	93	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	93.0		40 - 110						

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

Lab Sample ID: MB 160-228567/1-A  
Matrix: Water  
Analysis Batch: 229532

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 228567

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.09709	U	0.218	0.218	1.00	0.373	pCi/L	12/21/15 15:19	12/24/15 18:29	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.2		40 - 110					12/21/15 15:19	12/24/15 18:29	1
Y Carrier	83.9		40 - 110					12/21/15 15:19	12/24/15 18:29	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-77947-1

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

**Lab Sample ID: LCS 160-228567/2-A**  
**Matrix: Water**  
**Analysis Batch: 229532**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 228567**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	3.18	1.833		0.365	1.00	0.348	pCi/L	58	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	93.0		40 - 110
Y Carrier	99.3		40 - 110

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

# QC Association Summary

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

TestAmerica Job ID: 280-77947-1

## Metals

### Prep Batch: 211228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	3005A	
LCS 240-211228/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 240-211228/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 211721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	6020A	211228
LCS 240-211228/2-A	Lab Control Sample	Total Recoverable	Water	6020A	211228
MB 240-211228/1-A	Method Blank	Total Recoverable	Water	6020A	211228

### Prep Batch: 211754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	3005A	
LCS 240-211754/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 240-211754/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 212003

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	6020A	211754
LCS 240-211754/2-A	Lab Control Sample	Total Recoverable	Water	6020A	211754
MB 240-211754/1-A	Method Blank	Total Recoverable	Water	6020A	211754

### Analysis Batch: 212247

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	6020A	211754

### Analysis Batch: 212572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total Recoverable	Ground Water	6020A	211754
LCS 240-211754/2-A	Lab Control Sample	Total Recoverable	Water	6020A	211754
MB 240-211754/1-A	Method Blank	Total Recoverable	Water	6020A	211754

### Prep Batch: 307770

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	7470A	
280-77947-1 MS	MW-7	Total/NA	Ground Water	7470A	
280-77947-1 MSD	MW-7	Total/NA	Ground Water	7470A	
LCS 280-307770/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 280-307770/1-A	Method Blank	Total/NA	Water	7470A	

### Analysis Batch: 307937

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	7470A	307770
280-77947-1 MS	MW-7	Total/NA	Ground Water	7470A	307770
280-77947-1 MSD	MW-7	Total/NA	Ground Water	7470A	307770
LCS 280-307770/2-A	Lab Control Sample	Total/NA	Water	7470A	307770
MB 280-307770/1-A	Method Blank	Total/NA	Water	7470A	307770

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-77947-1

## General Chemistry

### Analysis Batch: 307857

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	SM 2540C	
280-77947-1 DU	MW-7	Total/NA	Ground Water	SM 2540C	
LCS 280-307857/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 280-307857/1	Method Blank	Total/NA	Water	SM 2540C	

### Analysis Batch: 308088

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	9040B	
LCS 280-308088/27	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 308317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	SM 2540D	
LCS 280-308317/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 280-308317/2	Method Blank	Total/NA	Water	SM 2540D	

### Analysis Batch: 308992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	9056A	
LCS 280-308992/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-308992/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 280-308992/6	Method Blank	Total/NA	Water	9056A	
MRL 280-308992/3	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 309062

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	9056A	
LCS 280-309062/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-309062/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 280-309062/6	Method Blank	Total/NA	Water	9056A	
MRL 280-309062/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 228567

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	PrecSep_0	
LCS 160-228567/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
MB 160-228567/1-A	Method Blank	Total/NA	Water	PrecSep_0	

### Prep Batch: 228569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-77947-1	MW-7	Total/NA	Ground Water	PrecSep-21	
LCS 160-228569/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
MB 160-228569/1-A	Method Blank	Total/NA	Water	PrecSep-21	

TestAmerica Denver



# Lab Chronicle

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

TestAmerica Job ID: 280-77947-1

**Client Sample ID: MW-7**  
**Date Collected: 12/11/15 08:20**  
**Date Received: 12/11/15 13:30**

**Lab Sample ID: 280-77947-1**  
**Matrix: Ground 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	211228	12/17/15 07:43	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	211721	12/18/15 15:47	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	211754	12/21/15 10:26	WKD	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	212003	12/22/15 13:16	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	211754	12/21/15 10:26	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	212247	12/23/15 13:12	RKT	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	211754	12/21/15 10:26	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	212572	12/29/15 13:45	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	307770	12/15/15 09:50	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	307937	12/15/15 14:36	CDH	TAL DEN
Total/NA	Analysis	9040B		1			308088	12/16/15 23:32	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	308992	12/28/15 18:17	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	309062	12/29/15 19:18	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	307857	12/15/15 18:52	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	308317	12/18/15 16:23	MW1	TAL DEN
Total/NA	Prep	PrecSep-21			1000.70 mL	1.0 g	228569	12/21/15 15:19	SCB	TAL SL
Total/NA	Analysis	9315		1	1000.70 mL		231800	01/12/16 07:05	ALS	TAL SL
Total/NA	Prep	PrecSep_0			1000.70 mL	1.0 g	228567	12/21/15 15:19	SCB	TAL SL
Total/NA	Analysis	9320		1	1000.70 mL		229532	12/24/15 18:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			232912	01/18/16 21:10	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

# Certification Summary

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

TestAmerica Job ID: 280-77947-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Ground Water	Mercury
9040B		Ground Water	Temperature
9056A		Ground Water	Chloride
9056A		Ground Water	Fluoride
9056A		Ground Water	Sulfate

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-26-16 *
Kentucky (WW)	State Program	4	98016	12-31-16
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-16
Nevada	State Program	9	OH-000482008A	07-31-16
New Jersey	NELAP	2	OH001	06-30-16
New York	NELAP	2	10975	03-31-16 *
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-16 *
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-16 *
West Virginia DEP	State Program	3	210	12-31-15 *
Wisconsin	State Program	5	999518190	08-31-16

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-16
California	ELAP	9	2886	03-31-16
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-16
Illinois	NELAP	5	003757	11-30-16
Iowa	State Program	7	373	12-01-16
Kansas	NELAP	7	E-10236	01-31-16 *
Kentucky (DW)	State Program	4	90125	12-31-15 *
L-A-B	DoD ELAP		L2305	04-10-16 *
Louisiana	NELAP	6	04080	06-30-16
Louisiana (DW)	NELAP	6	LA160008	12-31-16

\* Certification renewal pending - certification considered valid.

# Certification Summary

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

TestAmerica Job ID: 280-77947-1

## Laboratory: TestAmerica St. Louis (Continued)

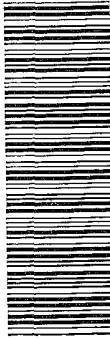
All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

Authority	Program	EPA Region	Certification ID	Expiration Date
Maryland	State Program	3	310	09-30-16
Missouri	State Program	7	780	06-30-16
Nevada	State Program	9	MO000542016-1	07-31-16
New Jersey	NELAP	2	MO002	06-30-16
New York	NELAP	2	11616	03-31-16 *
North Dakota	State Program	8	R207	06-30-16
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-16
Pennsylvania	NELAP	3	68-00540	02-28-16 *
South Carolina	State Program	4	85002001	06-30-16
Texas	NELAP	6	T104704193-15-9	07-31-16
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542015-7	07-31-16
Virginia	NELAP	3	460230	06-14-16
Washington	State Program	10	C592	08-30-16
West Virginia DEP	State Program	3	381	08-31-16

\* Certification renewal pending - certification considered valid.

TestAmerica Denver

Chain of Custody Record



<b>Client Information</b> Client Contact: Anna Lundin Company: HDR Inc Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State/Zip: CO, 80112 Phone: 720-633-2380 (Tel) Email: anna.lundin@hdrinc.com Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		Lab PM: Kupper, Stephanie L E-Mail: stephanie.kupper@testamericainc.com Due Date Requested: TAT Requested (days): Standard PO #: DEN-001 WO #: Project #: 28014371 SSO#:		Sampler: <i>Greta Kelly</i> Phone: <i>780 583 7475</i>		COC No: Page 1 of 1 Job #: Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Y - EDA Z - other (specify) Other:	
<b>Sample Identification</b> Sample Date: 12/11/15 Sample Time: 0830 Sample Type (C=Comp, G=grab): G Matrix (W=water, S=solid, O=waste/oil, BT=leach, AS=As): Water		Field Filtered Sample (Yes or No): N Performance/MSD (Yes or No): N 2540C - Total Dissolved Solids (TDS): N Metals - 6020A, 7470A: N pH - 9040B, Anions - 9056A, 28D: N 2640D - Total Suspended Solids: N 9315, Ra226, 9320, Ra228: N		Total Number of Containers: X Special Instructions/Note: refer to project setup		Analysis Requested:	
Possible Hazard Identification <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months		Special Instructions/QC Requirements: see Project Setup	
Empty Kit Relinquished by: <i>Greta Kelly</i> Date/Time: 12/11/15 0830 Relinquished by: <i>Anna &amp; Greta</i> Date/Time: 12/11/15 1330 Relinquished by:		Date: 12/11/15 0830 Date/Time: 12/11/15 1330 Date/Time:		Received by: <i>Anna &amp; Greta</i> Date/Time: 12/11/15 9:50 Received by: <i>Anna &amp; Greta</i> Date/Time: 12/11/15 1330 Received by:		Method of Shipment:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 1. IIRG was fully milled		Company: HDR Company: HDR Company: HDR		Company: HDR Company: TAD Company:	



**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b> Client Contact: _____ Shipping/Receiving: _____ Company: TestAmerica Laboratories, Inc. Address: 13715 Rider Trail North, City: _____ State, Zip: MO, 63045 Phone: 314-298-8566(Tel) 314-298-8757(Fax) Email: _____ Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		Lab PM: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com Carrier Tracking No(s): _____ COC No: 280-333723.1 Page: Page 1 of 1 Job #: 280-77947-1	
Due Date Requested: 1/12/2016 TAT Requested (days): _____ PO #: _____ WO #: _____ Project #: 28014371 SSOW#: _____		<b>Analysis Requested</b> 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 - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
<b>Sample Identification - Client ID (Lab ID)</b> MW-7 (280-77947-1)		Total Number of Containers: 2	
Sample Date: 12/11/15 Sample Time: 08:20 Mountain Matrix (W=Water, S=Solid, O=Organic, B=BT-Tissue, A=Air) Water		Special Instructions/Note: _____	
Sample Date: _____ Sample Time: _____ Matrix: _____ Preservation Code: _____		Field Filtered Sample (Yes or No) _____ Perform MS/MSD (Yes or No) _____	
Sample Date: _____ Sample Time: _____ Matrix: _____ Preservation Code: _____		Ra26_Ra228/ Ra-226/Ra-228 Calc - 3/3 - SUB X 9316_Ra226/PreSep_21 Radium-226 - 1/3 - SUB X 9320_Ra228/PreSep_0 Radium-228 - 2/3 - SUB X	
<b>Possible Hazard Identification</b> Unconfirmed _____ Deliverable Requested: I, II, III, IV, Other (specify) _____			
Empty Kit Relinquished by: _____ Relinquished by: <i>[Signature]</i> Relinquished by: _____ Relinquished by: _____ Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No Custody Seal No.: _____			
Date/Time: 12-15-15 15:30 Date/Time: _____ Date/Time: _____		Date/Time: 12/16/15 9:30AM Date/Time: _____ Date/Time: _____	
Relinquished by: _____ Relinquished by: _____ Relinquished by: _____		Relinquished by: <i>[Signature]</i> Relinquished by: _____ Relinquished by: _____	
Date: _____ Date: _____ Date: _____		Date: _____ Date: _____ Date: _____	
Method of Shipment: _____		Method of Shipment: _____	
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months			
Special Instructions/QC Requirements: _____			
Cooler Temperature(s) °C and Other Remarks: _____			



3.8/C3.5

Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b> Client Contact: Shipping/Receiving Company: TestAmerica Laboratories, Inc. Address: 4101 Shuffel Street NW, North Canton, OH, 44720 Phone: 330-497-9396 (Tel) 330-497-0772 (Fax) Email: Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		Lab PM: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com Carrier Tracking No(s): Job #: 280-77947-1		COC No: 280-333724.1 Page: Page 1 of 1	
Due Date Requested: 1/8/2016 TAT Requested (days): PO #: WO #: Project #: 28014371 SSOW#:		<b>Analysis Requested</b> 6020/3005A 14 Metals (Includes B and Ca) - 1/2 - SUB Total Number of Containers:			
<b>Sample Identification - Client ID (Lab ID)</b> MW-7 (280-77947-1)		Sample Date: 12/11/15 Sample Time: 08:20 Mountain	Sample Type (C=Comp, G=grab): Matrix (W=water, S=solid, O=water/oil, A=atmospheric): Preservation Code:	Field Filtered Sample (Yes/No): Perform MS/MSD (Yes/No): X	Special Instructions/Note: Use Collision Cell
<b>Possible Hazard Identification</b> Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)					
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Special Instructions/QC Requirements:					
Empty Kit Relinquished by: <i>[Signature]</i> Relinquished by: <i>[Signature]</i> Relinquished by:		Date: 12-15-15 15:30 Date/Time: 12/15/15 9:30 Date/Time:			
Relinquished by: <i>[Signature]</i> Relinquished by:		Date/Time: 12/15/15 9:30 Date/Time:			
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks:			





TestAmerica Canton Sample Receipt Form/Narrative

Login # : \_\_\_\_\_

Canton Facility

Client TA Denver Site Name \_\_\_\_\_

Cooler unpacked by: J. Jemel

Cooler Received on 12/16/15 Opened on 12/16/15

FedEx: 1<sup>st</sup> Grd  Exp  UPS  FAS  Stetson 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
  - IR GUN# 53 (CF +0.1 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
  - IR GUN# 48 (CF -0.3 °C) Observed Cooler Temp. 3.8 °C Corrected Cooler Temp. 3.5 °C  See Multiple
  - IR GUN# 5 (CF +0.4 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  Cooler Form
  - IR GUN# 8 (CF -0.5 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C

- 2. Were custody seals on the outside of the cooler(s)? If Yes Quantity \_\_\_\_\_ Yes  No 
  - Were custody seals on the outside of the cooler(s) signed & dated? Yes  No  NA
  - Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes  No
- 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. Were sample(s) at the correct pH upon receipt? Yes  No  NA pH Strip Lot# HC559158
- 12. Were VOAs on the COC? Yes  No
- 13. Were air bubbles >6 mm in any VOA vials? Yes  No
- 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_ Yes  No
- 15. Was a LL Hg or Me Hg trip blank present? Yes  No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal  Voice  Mail  Other \_\_\_\_\_

Concerning \_\_\_\_\_

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15. 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)

16. 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: 280-77947-1

**Login Number: 77947**

**List Number: 1**

**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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.	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 <math><6\text{mm}</math> (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: 280-77947-1

**Login Number: 77947**

**List Number: 3**

**Creator: McKinney, Gerrod E**

**List Source: TestAmerica St. Louis**

**List Creation: 12/16/15 12:53 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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	2.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time.	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 <math><6\text{mm}</math> (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: 280-77947-1

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
280-77947-1	MW-7	75.9	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
LCS 160-228569/2-A	Lab Control Sample	93.0	
MB 160-228569/1-A	Method Blank	96.2	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-77947-1	MW-7	75.9	92.3
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
LCS 160-228567/2-A	Lab Control Sample	93.0	99.3
MB 160-228567/1-A	Method Blank	96.2	83.9
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = 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: 280-80273-1

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:

3/31/2016 11:23:11 AM

Stephanie Kupper, Project Manager I

(303)736-0182

[stephanie.kupper@testamericainc.com](mailto:stephanie.kupper@testamericainc.com)

### LINKS

Review your project  
results through

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Have a Question?



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[www.testamericainc.com](http://www.testamericainc.com)

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

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 280-80273-1

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

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-80273-1

**Job ID: 280-80273-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-80273-1**

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 3/1/2016 at 3:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.9° C, 2.7° C and 2.9° C.

### **TOTAL RECOVERABLE METALS (ICPMS)**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 03/07/2016 and analyzed on 03/16/2016, 03/21/2016 and 03/24/2016.

Barium, Beryllium, Calcium and Cobalt were detected in method blank MB 240-220532/1-A 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.

Calcium failed the recovery criteria high for the MS of sample 240-61728-2 in batch 240-221601. 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-7 (280-80273-1)[20X], MW-8 (280-80273-2)[50X], MW-9 (280-80273-3)[50X], MW-10 (280-80273-4)[20X], MW-13 (280-80273-5)[20X] and MW-9D (280-80273-6)[50X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Some project-specific reporting limits on the following samples fall below the laboratory's verified standard quantitation limit: MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6), MW-10EB (280-80273-7). The continuing calibration blanks and method blanks may not support the lower RL.

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

### **TOTAL MERCURY**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/14/2016.

# Case Narrative

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

TestAmerica Job ID: 280-80273-1

## Job ID: 280-80273-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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

#### **TOTAL DISSOLVED SOLIDS**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 03/02/2016.

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

#### **TOTAL SUSPENDED SOLIDS**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 03/02/2016.

The following samples were diluted due to slow filtration and high Total Suspended Solids: MW-7 (280-80273-1). Elevated reporting limits (RLs) are provided.

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

#### **CORROSIVITY (PH)**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 03/04/2016.

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

#### **ANIONS (28 DAYS)**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 03/09/2016.

Samples MW-7 (280-80273-1)[10X], MW-8 (280-80273-2)[10X], MW-9 (280-80273-3)[10X], MW-10 (280-80273-4)[10X], MW-13 (280-80273-5)[5X] and MW-9D (280-80273-6)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

#### **RADIUM-226 (GFPC)**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 03/08/2016 and analyzed on 03/30/2016.

The following sample was prepared at a reduced aliquot due to sediment and discoloration in the sample: MW-7 (280-80273-1).

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3).

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

#### **RADIUM-228**

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 03/09/2016 and analyzed on 03/23/2016 and 03/25/2016.

Radium-228 was detected in method blank MB 160-239659/1-A at a level that was above the method detection limit but below the



# Case Narrative

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

TestAmerica Job ID: 280-80273-1

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## Job ID: 280-80273-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

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-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3).

The following sample was prepared at a reduced aliquot due to sediment and discoloration in the sample: MW-7 (280-80273-1).

The detection goal for Radium-228 was not met for the following samples due to a reduction of the sample size attributed to high residual mass: MW-7 (280-80273-1). Analytical results are reported with the detection limit achieved.

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

### RADIUM-226/RADIUM-228 (GFPC)

Samples MW-7 (280-80273-1), MW-8 (280-80273-2), MW-9 (280-80273-3), MW-10 (280-80273-4), MW-13 (280-80273-5), MW-9D (280-80273-6) and MW-10EB (280-80273-7) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 03/30/2016.

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: 280-80273-1

**Client Sample ID: MW-7**

**Lab Sample ID: 280-80273-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00045	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0030	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.12	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.0010	B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	1.1		0.40	0.22	mg/L	20		6020A	Total Recoverable
Cadmium	0.00051	J	0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	240	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.018		0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.0036	B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.0076		0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.062		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0085	J	0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0081		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
Thallium	0.00030	J	0.0010	0.000074	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.85	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	21.2	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	660		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	0.98		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	470		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	1100		40	11	mg/L	1		SM 2540D	Total/NA

**Client Sample ID: MW-8**

**Lab Sample ID: 280-80273-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00023	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0015	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.033	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00036	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	2.5		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0015		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	360	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00086	J	0.0020	0.00060	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: 280-80273-1

## Client Sample ID: MW-8 (Continued)

## Lab Sample ID: 280-80273-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.0045	B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00035	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.087		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.11		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.015		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.70	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	20.3	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	480		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.6		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1400		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2900		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	21		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9

## Lab Sample ID: 280-80273-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0018	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0031	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.061	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00026	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	2.9		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0031		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	410	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.0029	B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.0033		0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.12		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.033		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0069		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.99	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	20.7	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	750		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1300		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	3200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	17		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 280-80273-4

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: 280-80273-1

## Client Sample ID: MW-10 (Continued)

## Lab Sample ID: 280-80273-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0025		0.0020	0.00016	mg/L	1		6020A	Total
Arsenic	0.0038	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.074	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00020	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	1.6		0.40	0.22	mg/L	20		6020A	Total Recoverable
Cadmium	0.0013		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	300	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00068	J	0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.0029	B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00016	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.027		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.011		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	9.16	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	20.1	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	550		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	870		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-80273-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00062	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.084	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00012	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	0.86		0.40	0.22	mg/L	20		6020A	Total Recoverable
Calcium	130	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.00025	J B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lithium	0.037		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0026	J	0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0055		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.87	HF	0.100	0.100	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: 280-80273-1

## Client Sample ID: MW-13 (Continued)

## Lab Sample ID: 280-80273-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Temperature	20.8	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	280		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	180		5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	1000		10	4.7	mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-9D

## Lab Sample ID: 280-80273-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0014	J	0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0026	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.054	B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00011	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Boron	3.4		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0030		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	420	B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00075	J	0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021	B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.0034		0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.034		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0073		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.91	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	21.1	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	690		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.1		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)	3100		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

## Client Sample ID: MW-10EB

## Lab Sample ID: 280-80273-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0047	J B	0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Beryllium	0.00013	J B	0.0010	0.000053	mg/L	1		6020A	Total Recoverable
Calcium	0.99	J B	1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00091	J	0.0020	0.00060	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: 280-80273-1

**Client Sample ID: MW-10EB (Continued)**

**Lab Sample ID: 280-80273-7**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Cobalt	0.000060	J B	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00024	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.00029	J	0.0080	0.00029	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.59	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	20.2	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	1.1	J	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	2.1	J	5.0	0.23	mg/L	1		9056A	Total/NA
Total Suspended Solids	2.4	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: 280-80273-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-80273-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-80273-1	MW-7	Ground Water	03/01/16 09:15	03/01/16 15:15
280-80273-2	MW-8	Ground Water	02/29/16 15:05	03/01/16 15:15
280-80273-3	MW-9	Ground Water	03/01/16 12:15	03/01/16 15:15
280-80273-4	MW-10	Ground Water	03/01/16 14:00	03/01/16 15:15
280-80273-5	MW-13	Water	02/29/16 12:20	03/01/16 15:15
280-80273-6	MW-9D	Ground Water	03/01/16 12:15	03/01/16 15:15
280-80273-7	MW-10EB	Ground Water	03/01/16 14:30	03/01/16 15:15

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# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00045	J	0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:19	1
Arsenic	0.0030	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:19	1
Barium	0.12	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:19	1
Beryllium	0.0010	B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:19	1
Boron	1.1		0.40	0.22	mg/L		03/07/16 13:37	03/24/16 12:33	20
Cadmium	0.00051	J	0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:19	1
Calcium	240	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:19	1
Chromium	0.018		0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 15:40	1
Cobalt	0.0036	B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:19	1
Lead	0.0076		0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:19	1
Lithium	0.062		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:19	1
Molybdenum	0.0085	J	0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:19	1
Selenium	0.0081		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:19	1
Thallium	0.00030	J	0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:19	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00023	J	0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:23	1
Arsenic	0.0015	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:23	1
Barium	0.033	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:23	1
Beryllium	0.00036	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:23	1
Boron	2.5		1.0	0.55	mg/L		03/07/16 13:37	03/24/16 12:37	50
Cadmium	0.0015		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:23	1
Calcium	360	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:23	1
Chromium	0.00086	J	0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 15:48	1
Cobalt	0.0045	B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:23	1
Lead	0.00035	J	0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:23	1
Lithium	0.087		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:23	1
Molybdenum	0.11		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:23	1
Selenium	0.015		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:23	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:23	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0018	J	0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:27	1
Arsenic	0.0031	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:27	1
Barium	0.061	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:27	1
Beryllium	0.00026	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:27	1
Boron	2.9		1.0	0.55	mg/L		03/07/16 13:37	03/24/16 12:41	50
Cadmium	0.0031		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:27	1
Calcium	410	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:27	1
Chromium	ND		0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 15:56	1
Cobalt	0.0029	B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:27	1
Lead	0.0033		0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:27	1
Lithium	0.12		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:27	1
Molybdenum	0.033		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:27	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.0069		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:27	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:27	1

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0025		0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:31	1
Arsenic	0.0038	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:31	1
Barium	0.074	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:31	1
Beryllium	0.00020	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:31	1
Boron	1.6		0.40	0.22	mg/L		03/07/16 13:37	03/24/16 12:45	20
Cadmium	0.0013		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:31	1
Calcium	300	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:31	1
Chromium	0.00068	J	0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 16:05	1
Cobalt	0.0029	B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:31	1
Lead	0.00016	J	0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:31	1
Lithium	0.11		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:31	1
Molybdenum	0.027		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:31	1
Selenium	0.011		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:31	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:31	1

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:35	1
Arsenic	0.00062	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:35	1
Barium	0.084	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:35	1
Beryllium	0.00012	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:35	1
Boron	0.86		0.40	0.22	mg/L		03/07/16 13:37	03/24/16 13:00	20
Cadmium	ND		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:35	1
Calcium	130	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:35	1
Chromium	ND		0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 16:22	1
Cobalt	0.00025	J B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:35	1
Lead	ND		0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:35	1
Lithium	0.037		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:35	1
Molybdenum	0.0026	J	0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:35	1
Selenium	0.0055		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:35	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:35	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0014	J	0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:40	1
Arsenic	0.0026	J	0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:40	1
Barium	0.054	B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:40	1
Beryllium	0.00011	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:40	1
Boron	3.4		1.0	0.55	mg/L		03/07/16 13:37	03/24/16 12:54	50

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	0.0030		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:40	1
Calcium	420	B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:40	1
Chromium	0.00075	J	0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 16:30	1
Cobalt	0.0021	B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:40	1
Lead	0.0034		0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:40	1
Lithium	0.11		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:40	1
Molybdenum	0.034		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:40	1
Selenium	0.0073		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:40	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:40	1

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:44	1
Arsenic	ND		0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:44	1
Barium	0.0047	J B	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:44	1
Beryllium	0.00013	J B	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:44	1
Boron	ND		0.020	0.011	mg/L		03/07/16 13:37	03/24/16 13:13	1
Cadmium	ND		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:44	1
Calcium	0.99	J B	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:44	1
Chromium	0.00091	J	0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 16:39	1
Cobalt	0.000060	J B	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:44	1
Lead	0.00024	J	0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:44	1
Lithium	0.00029	J	0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:44	1
Molybdenum	ND		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:44	1
Selenium	ND		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:44	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:44	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:25	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:32	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:39	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:41	1

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:43	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:46	1

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:48	1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.85	HF	0.100	0.100	SU			03/04/16 17:26	1
Temperature	21.2	HF	1.00	1.00	Degrees C			03/04/16 17:26	1
Chloride	660		30	2.5	mg/L			03/09/16 19:11	10
Fluoride	0.98		0.50	0.060	mg/L			03/09/16 18:53	1
Sulfate	470		50	2.3	mg/L			03/09/16 19:11	10
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L			03/02/16 14:47	1
Total Suspended Solids	1100		40	11	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.70	HF	0.100	0.100	SU			03/04/16 17:15	1
Temperature	20.3	HF	1.00	1.00	Degrees C			03/04/16 17:15	1
Chloride	480		30	2.5	mg/L			03/09/16 20:21	10
Fluoride	1.6		0.50	0.060	mg/L			03/09/16 20:04	1
Sulfate	1400		50	2.3	mg/L			03/09/16 20:21	10
Total Dissolved Solids (TDS)	2900		20	9.4	mg/L			03/02/16 14:47	1
Total Suspended Solids	21		4.0	1.1	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.99	HF	0.100	0.100	SU			03/04/16 17:20	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

## General Chemistry (Continued)

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	20.7	HF	1.00	1.00	Degrees C			03/04/16 17:20	1
Chloride	750		30	2.5	mg/L			03/09/16 20:57	10
Fluoride	2.1		0.50	0.060	mg/L			03/09/16 20:39	1
Sulfate	1300		50	2.3	mg/L			03/09/16 20:57	10
Total Dissolved Solids (TDS)	3200		20	9.4	mg/L			03/02/16 14:47	1
Total Suspended Solids	17		4.0	1.1	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	9.16	HF	0.100	0.100	SU			03/04/16 17:07	1
Temperature	20.1	HF	1.00	1.00	Degrees C			03/04/16 17:07	1
Chloride	550		30	2.5	mg/L			03/09/16 21:32	10
Fluoride	2.0		0.50	0.060	mg/L			03/09/16 21:14	1
Sulfate	870		50	2.3	mg/L			03/09/16 21:32	10
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L			03/02/16 14:47	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.87	HF	0.100	0.100	SU			03/04/16 17:36	1
Temperature	20.8	HF	1.00	1.00	Degrees C			03/04/16 17:36	1
Chloride	280		15	1.3	mg/L			03/09/16 22:08	5
Fluoride	1.1		0.50	0.060	mg/L			03/09/16 21:50	1
Sulfate	180		5.0	0.23	mg/L			03/09/16 21:50	1
Total Dissolved Solids (TDS)	1000		10	4.7	mg/L			03/02/16 14:47	1
Total Suspended Solids	ND		4.0	1.1	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.91	HF	0.100	0.100	SU			03/04/16 17:31	1
Temperature	21.1	HF	1.00	1.00	Degrees C			03/04/16 17:31	1
Chloride	690		30	2.5	mg/L			03/09/16 22:43	10
Fluoride	2.1		0.50	0.060	mg/L			03/09/16 22:25	1
Sulfate	1200		50	2.3	mg/L			03/09/16 22:43	10
Total Dissolved Solids (TDS)	3100		20	9.4	mg/L			03/02/16 14:47	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			03/02/16 16:26	1

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.59	HF	0.100	0.100	SU			03/04/16 17:01	1
Temperature	20.2	HF	1.00	1.00	Degrees C			03/04/16 17:01	1
Chloride	1.1	J	3.0	0.25	mg/L			03/09/16 23:36	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

## General Chemistry (Continued)

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	ND		0.50	0.060	mg/L			03/09/16 23:36	1
Sulfate	2.1	J	5.0	0.23	mg/L			03/09/16 23:36	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			03/02/16 14:47	1
Total Suspended Solids	2.4	J	4.0	1.1	mg/L			03/02/16 16:26	1

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

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.13		0.314	0.330	1.00	0.243	pCi/L	03/08/16 12:46	03/30/16 07:57	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	84.0		40 - 110					03/08/16 12:46	03/30/16 07:57	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0917	U	0.0686	0.0691	1.00	0.105	pCi/L	03/08/16 12:46	03/30/16 07:57	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.4		40 - 110					03/08/16 12:46	03/30/16 07:57	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.200		0.0662	0.0686	1.00	0.0659	pCi/L	03/08/16 12:46	03/30/16 07:58	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	101		40 - 110					03/08/16 12:46	03/30/16 07:58	1

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.121		0.0628	0.0638	1.00	0.0776	pCi/L	03/08/16 13:37	03/30/16 07:31	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	93.2		40 - 110					03/08/16 13:37	03/30/16 07:31	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.283		0.0954	0.0987	1.00	0.112	pCi/L	03/08/16 13:37	03/30/16 07:31	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					03/08/16 13:37	03/30/16 07:31	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.212		0.0762	0.0785	1.00	0.0798	pCi/L	03/08/16 13:37	03/30/16 07:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					03/08/16 13:37	03/30/16 07:32	1

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0230	U	0.0612	0.0612	1.00	0.109	pCi/L	03/08/16 13:37	03/30/16 07:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110					03/08/16 13:37	03/30/16 07:32	1

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

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.69	G	1.01	1.02	1.00	1.51	pCi/L	03/09/16 08:31	03/23/16 12:17	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110					03/09/16 08:31	03/23/16 12:17	1
Y Carrier	84.9		40 - 110					03/09/16 08:31	03/23/16 12:17	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.408	U	0.274	0.276	1.00	0.426	pCi/L	03/09/16 08:31	03/23/16 12:17	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.4		40 - 110	03/09/16 08:31	03/23/16 12:17	1
Y Carrier	77.8		40 - 110	03/09/16 08:31	03/23/16 12:17	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.602		0.239	0.245	1.00	0.333	pCi/L	03/09/16 08:31	03/23/16 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	03/09/16 08:31	03/23/16 12:17	1
Y Carrier	83.4		40 - 110	03/09/16 08:31	03/23/16 12:17	1

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.04		0.309	0.324	1.00	0.397	pCi/L	03/09/16 08:29	03/25/16 12:31	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.2		40 - 110	03/09/16 08:29	03/25/16 12:31	1
Y Carrier	82.6		40 - 110	03/09/16 08:29	03/25/16 12:31	1

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.631		0.241	0.248	1.00	0.329	pCi/L	03/09/16 08:29	03/25/16 12:31	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110	03/09/16 08:29	03/25/16 12:31	1
Y Carrier	87.5		40 - 110	03/09/16 08:29	03/25/16 12:31	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.612		0.234	0.241	1.00	0.324	pCi/L	03/09/16 08:29	03/25/16 12:31	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	103		40 - 110	03/09/16 08:29	03/25/16 12:31	1
Y Carrier	92.3		40 - 110	03/09/16 08:29	03/25/16 12:31	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.00919	U	0.210	0.210	1.00	0.372	pCi/L	03/09/16 08:29	03/25/16 12:31	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	103		40 - 110					03/09/16 08:29	03/25/16 12:31	1
Y Carrier	93.5		40 - 110					03/09/16 08:29	03/25/16 12:31	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>2.82</b>		1.05	1.07	5.00	1.51	pCi/L		03/30/16 20:35	1

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.499</b>		0.282	0.285	5.00	0.426	pCi/L		03/30/16 20:35	1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.802</b>		0.248	0.255	5.00	0.333	pCi/L		03/30/16 20:35	1

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>1.16</b>		0.315	0.330	5.00	0.397	pCi/L		03/30/16 20:35	1

# Client Sample Results

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

TestAmerica Job ID: 280-80273-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-13**  
**Date Collected: 02/29/16 12:20**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.913		0.259	0.267	5.00	0.329	pCi/L		03/30/16 20:35	1

**Client Sample ID: MW-9D**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.824		0.246	0.253	5.00	0.324	pCi/L		03/30/16 20:35	1

**Client Sample ID: MW-10EB**  
**Date Collected: 03/01/16 14:30**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-7**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0322	U	0.219	0.219	5.00	0.372	pCi/L		03/30/16 20:35	1

# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Lab Sample ID: MB 240-220532/1-A**  
**Matrix: Water**  
**Analysis Batch: 221729**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		03/07/16 13:37	03/16/16 03:11	1
Arsenic	ND		0.0050	0.00049	mg/L		03/07/16 13:37	03/16/16 03:11	1
Barium	0.00211	J	0.0050	0.0011	mg/L		03/07/16 13:37	03/16/16 03:11	1
Beryllium	0.000134	J	0.0010	0.000053	mg/L		03/07/16 13:37	03/16/16 03:11	1
Cadmium	ND		0.0010	0.000061	mg/L		03/07/16 13:37	03/16/16 03:11	1
Calcium	0.625	J	1.0	0.24	mg/L		03/07/16 13:37	03/16/16 03:11	1
Cobalt	0.0000270	J	0.0010	0.000021	mg/L		03/07/16 13:37	03/16/16 03:11	1
Lead	ND		0.0010	0.00011	mg/L		03/07/16 13:37	03/16/16 03:11	1
Lithium	ND		0.0080	0.00029	mg/L		03/07/16 13:37	03/16/16 03:11	1
Molybdenum	ND		0.010	0.00023	mg/L		03/07/16 13:37	03/16/16 03:11	1
Selenium	ND		0.0050	0.00025	mg/L		03/07/16 13:37	03/16/16 03:11	1
Thallium	ND		0.0010	0.000074	mg/L		03/07/16 13:37	03/16/16 03:11	1

**Lab Sample ID: MB 240-220532/1-A**  
**Matrix: Water**  
**Analysis Batch: 222513**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	ND		0.0020	0.00060	mg/L		03/07/16 13:37	03/21/16 15:31	1

**Lab Sample ID: MB 240-220532/1-A**  
**Matrix: Water**  
**Analysis Batch: 223095**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.020	0.011	mg/L		03/07/16 13:37	03/24/16 12:24	1

**Lab Sample ID: LCS 240-220532/2-A**  
**Matrix: Water**  
**Analysis Batch: 221729**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

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	0.884		mg/L		88	80 - 120
Barium	1.00	0.944		mg/L		94	80 - 120
Beryllium	1.00	0.891		mg/L		89	80 - 120
Cadmium	1.00	0.958		mg/L		96	80 - 120
Calcium	10.0	10.5		mg/L		105	80 - 120
Cobalt	1.00	1.04		mg/L		104	80 - 120
Lead	1.00	1.12		mg/L		112	80 - 120
Lithium	0.100	0.0834		mg/L		83	80 - 120
Molybdenum	0.100	0.0953		mg/L		95	80 - 120
Selenium	1.00	0.910		mg/L		91	80 - 120
Thallium	0.250	0.277		mg/L		111	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Lab Sample ID: LCS 240-220532/2-A**  
**Matrix: Water**  
**Analysis Batch: 222513**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium	1.00	0.990		mg/L		99	80 - 120

**Lab Sample ID: LCS 240-220532/2-A**  
**Matrix: Water**  
**Analysis Batch: 223095**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 220532**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	0.100	0.0893		mg/L		89	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-316714/1-A**  
**Matrix: Water**  
**Analysis Batch: 316886**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 316714**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		03/14/16 11:20	03/14/16 18:13	1

**Lab Sample ID: LCS 280-316714/2-A**  
**Matrix: Water**  
**Analysis Batch: 316886**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 316714**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.20		ug/L		104	84 - 120

**Lab Sample ID: 280-80273-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 316886**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 316714**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	ND		5.00	5.18		ug/L		104	75 - 125

**Lab Sample ID: 280-80273-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 316886**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 316714**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Mercury	ND		5.00	5.07		ug/L		101	75 - 125	2	20

## Method: 9040B - pH

**Lab Sample ID: LCS 280-315914/4**  
**Matrix: Water**  
**Analysis Batch: 315914**

**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	7.060		SU		101	99 - 101

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-316298/6**  
**Matrix: Water**  
**Analysis Batch: 316298**

**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			03/09/16 11:53	1
Fluoride	ND		0.50	0.060	mg/L			03/09/16 11:53	1
Sulfate	ND		5.0	0.23	mg/L			03/09/16 11:53	1

**Lab Sample ID: LCS 280-316298/4**  
**Matrix: Water**  
**Analysis Batch: 316298**

**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	100		mg/L		100	90 - 110

**Lab Sample ID: LCSD 280-316298/5**  
**Matrix: Water**  
**Analysis Batch: 316298**

**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	100		mg/L		100	90 - 110	0	10

**Lab Sample ID: MRL 280-316298/3**  
**Matrix: Water**  
**Analysis Batch: 316298**

**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	2.47	J	mg/L		99	50 - 150
Fluoride	0.200	0.163	J	mg/L		82	50 - 150
Sulfate	2.50	2.46	J	mg/L		99	50 - 150

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

**Lab Sample ID: MB 280-315569/1**  
**Matrix: Water**  
**Analysis Batch: 315569**

**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			03/02/16 14:47	1

**Lab Sample ID: LCS 280-315569/2**  
**Matrix: Water**  
**Analysis Batch: 315569**

**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	491		mg/L		98	86 - 110

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

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

Lab Sample ID: 280-80273-5 DU  
 Matrix: Water  
 Analysis Batch: 315569

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	1000		1020		mg/L		0.5	10

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

Lab Sample ID: MB 280-315585/2  
 Matrix: Water  
 Analysis Batch: 315585

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			03/02/16 16:26	1

Lab Sample ID: LCS 280-315585/1  
 Matrix: Water  
 Analysis Batch: 315585

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	92.0		mg/L		92	86 - 114

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

Lab Sample ID: MB 160-239583/1-A  
 Matrix: Water  
 Analysis Batch: 242941

Client Sample ID: Method Blank  
 Prep Type: Total/NA  
 Prep Batch: 239583

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.001703	U	0.0324	0.0324	1.00	0.0668	pCi/L	03/08/16 12:46	03/30/16 07:50	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	103		40 - 110		03/08/16 12:46	03/30/16 07:50	1			

Lab Sample ID: LCS 160-239583/2-A  
 Matrix: Water  
 Analysis Batch: 242941

Client Sample ID: Lab Control Sample  
 Prep Type: Total/NA  
 Prep Batch: 239583

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	13.35		1.29	1.00	0.0968	pCi/L	120	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	107		40 - 110						

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# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Lab Sample ID: LCSD 160-239583/3-A**  
**Matrix: Water**  
**Analysis Batch: 242941**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 239583**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.2	13.29		1.29	1.00	0.0906	pCi/L	119	68 - 137	0.02	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>LCSD</b>	<b>Limits</b>							
Ba Carrier	103			40 - 110							

**Lab Sample ID: MB 160-239587/1-A**  
**Matrix: Water**  
**Analysis Batch: 242937**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 239587**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.009179	U	0.0428	0.0428	1.00	0.0821	pCi/L	03/08/16 13:37	03/30/16 07:31	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>MB</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.0			40 - 110				03/08/16 13:37	03/30/16 07:31	1

**Lab Sample ID: LCS 160-239587/2-A**  
**Matrix: Water**  
**Analysis Batch: 242937**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 239587**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	11.76		1.16	1.00	0.0685	pCi/L	105	68 - 137
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>LCS</b>	<b>Limits</b>					
Ba Carrier	104			40 - 110					

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

**Lab Sample ID: MB 160-239659/1-A**  
**Matrix: Water**  
**Analysis Batch: 242196**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 239659**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.9459		0.318	0.329	1.00	0.441	pCi/L	03/09/16 08:29	03/25/16 12:31	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>MB</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	98.0			40 - 110				03/09/16 08:29	03/25/16 12:31	1
Y Carrier	86.0			40 - 110				03/09/16 08:29	03/25/16 12:31	1

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# QC Sample Results

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

TestAmerica Job ID: 280-80273-1

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

**Lab Sample ID: LCS 160-239659/2-A**  
**Matrix: Water**  
**Analysis Batch: 242196**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 239659**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	15.4	9.402		1.07	1.00	0.364	pCi/L	61	56 - 140
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Ba Carrier	104		40 - 110						
Y Carrier	87.9		40 - 110						

**Lab Sample ID: MB 160-239662/1-A**  
**Matrix: Water**  
**Analysis Batch: 241797**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 239662**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.07816	U	0.218	0.218	1.00	0.376	pCi/L	03/09/16 08:31	03/23/16 12:08	1
<b>MB MB</b>										
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>							
Ba Carrier	103		40 - 110							
Y Carrier	80.4		40 - 110							
								<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
								03/09/16 08:31	03/23/16 12:08	1
								03/09/16 08:31	03/23/16 12:08	1

**Lab Sample ID: LCS 160-239662/2-A**  
**Matrix: Water**  
**Analysis Batch: 241797**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 239662**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	15.4	9.740		1.10	1.00	0.372	pCi/L	63	56 - 140
<b>LCS LCS</b>									
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>						
Ba Carrier	107		40 - 110						
Y Carrier	80.7		40 - 110						

**Lab Sample ID: LCSD 160-239662/3-A**  
**Matrix: Water**  
**Analysis Batch: 241797**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 239662**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	15.4	10.46		1.17	1.00	0.402	pCi/L	68	56 - 140	0.32	1
<b>LCSD LCSD</b>											
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>								
Ba Carrier	103		40 - 110								
Y Carrier	81.9		40 - 110								



# QC Association Summary

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

TestAmerica Job ID: 280-80273-1

## Metals

### Prep Batch: 220532

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total Recoverable	Ground Water	3005A	
280-80273-2	MW-8	Total Recoverable	Ground Water	3005A	
280-80273-3	MW-9	Total Recoverable	Ground Water	3005A	
280-80273-4	MW-10	Total Recoverable	Ground Water	3005A	
280-80273-5	MW-13	Total Recoverable	Water	3005A	
280-80273-6	MW-9D	Total Recoverable	Ground Water	3005A	
280-80273-7	MW-10EB	Total Recoverable	Ground Water	3005A	
LCS 240-220532/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 240-220532/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 221729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total Recoverable	Ground Water	6020A	220532
280-80273-2	MW-8	Total Recoverable	Ground Water	6020A	220532
280-80273-3	MW-9	Total Recoverable	Ground Water	6020A	220532
280-80273-4	MW-10	Total Recoverable	Ground Water	6020A	220532
280-80273-5	MW-13	Total Recoverable	Water	6020A	220532
280-80273-6	MW-9D	Total Recoverable	Ground Water	6020A	220532
280-80273-7	MW-10EB	Total Recoverable	Ground Water	6020A	220532
LCS 240-220532/2-A	Lab Control Sample	Total Recoverable	Water	6020A	220532
MB 240-220532/1-A	Method Blank	Total Recoverable	Water	6020A	220532

### Analysis Batch: 222513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total Recoverable	Ground Water	6020A	220532
280-80273-2	MW-8	Total Recoverable	Ground Water	6020A	220532
280-80273-3	MW-9	Total Recoverable	Ground Water	6020A	220532
280-80273-4	MW-10	Total Recoverable	Ground Water	6020A	220532
280-80273-5	MW-13	Total Recoverable	Water	6020A	220532
280-80273-6	MW-9D	Total Recoverable	Ground Water	6020A	220532
280-80273-7	MW-10EB	Total Recoverable	Ground Water	6020A	220532
LCS 240-220532/2-A	Lab Control Sample	Total Recoverable	Water	6020A	220532
MB 240-220532/1-A	Method Blank	Total Recoverable	Water	6020A	220532

### Analysis Batch: 223095

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total Recoverable	Ground Water	6020A	220532
280-80273-2	MW-8	Total Recoverable	Ground Water	6020A	220532
280-80273-3	MW-9	Total Recoverable	Ground Water	6020A	220532
280-80273-4	MW-10	Total Recoverable	Ground Water	6020A	220532
280-80273-5	MW-13	Total Recoverable	Water	6020A	220532
280-80273-6	MW-9D	Total Recoverable	Ground Water	6020A	220532
280-80273-7	MW-10EB	Total Recoverable	Ground Water	6020A	220532
LCS 240-220532/2-A	Lab Control Sample	Total Recoverable	Water	6020A	220532
MB 240-220532/1-A	Method Blank	Total Recoverable	Water	6020A	220532

### Prep Batch: 316714

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	7470A	
280-80273-1 MS	MW-7	Total/NA	Ground Water	7470A	
280-80273-1 MSD	MW-7	Total/NA	Ground Water	7470A	

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# QC Association Summary

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

TestAmerica Job ID: 280-80273-1

## Metals (Continued)

### Prep Batch: 316714 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-2	MW-8	Total/NA	Ground Water	7470A	
280-80273-3	MW-9	Total/NA	Ground Water	7470A	
280-80273-4	MW-10	Total/NA	Ground Water	7470A	
280-80273-5	MW-13	Total/NA	Water	7470A	
280-80273-6	MW-9D	Total/NA	Ground Water	7470A	
280-80273-7	MW-10EB	Total/NA	Ground Water	7470A	
LCS 280-316714/2-A	Lab Control Sample	Total/NA	Water	7470A	
MB 280-316714/1-A	Method Blank	Total/NA	Water	7470A	

### Analysis Batch: 316886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	7470A	316714
280-80273-1 MS	MW-7	Total/NA	Ground Water	7470A	316714
280-80273-1 MSD	MW-7	Total/NA	Ground Water	7470A	316714
280-80273-2	MW-8	Total/NA	Ground Water	7470A	316714
280-80273-3	MW-9	Total/NA	Ground Water	7470A	316714
280-80273-4	MW-10	Total/NA	Ground Water	7470A	316714
280-80273-5	MW-13	Total/NA	Water	7470A	316714
280-80273-6	MW-9D	Total/NA	Ground Water	7470A	316714
280-80273-7	MW-10EB	Total/NA	Ground Water	7470A	316714
LCS 280-316714/2-A	Lab Control Sample	Total/NA	Water	7470A	316714
MB 280-316714/1-A	Method Blank	Total/NA	Water	7470A	316714

## General Chemistry

### Analysis Batch: 315569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	SM 2540C	
280-80273-2	MW-8	Total/NA	Ground Water	SM 2540C	
280-80273-3	MW-9	Total/NA	Ground Water	SM 2540C	
280-80273-4	MW-10	Total/NA	Ground Water	SM 2540C	
280-80273-5	MW-13	Total/NA	Water	SM 2540C	
280-80273-5 DU	MW-13	Total/NA	Water	SM 2540C	
280-80273-6	MW-9D	Total/NA	Ground Water	SM 2540C	
280-80273-7	MW-10EB	Total/NA	Ground Water	SM 2540C	
LCS 280-315569/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 280-315569/1	Method Blank	Total/NA	Water	SM 2540C	

### Analysis Batch: 315585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	SM 2540D	
280-80273-2	MW-8	Total/NA	Ground Water	SM 2540D	
280-80273-3	MW-9	Total/NA	Ground Water	SM 2540D	
280-80273-4	MW-10	Total/NA	Ground Water	SM 2540D	
280-80273-5	MW-13	Total/NA	Water	SM 2540D	
280-80273-6	MW-9D	Total/NA	Ground Water	SM 2540D	
280-80273-7	MW-10EB	Total/NA	Ground Water	SM 2540D	
LCS 280-315585/1	Lab Control Sample	Total/NA	Water	SM 2540D	
MB 280-315585/2	Method Blank	Total/NA	Water	SM 2540D	

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# QC Association Summary

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

TestAmerica Job ID: 280-80273-1

## General Chemistry (Continued)

### Analysis Batch: 315914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	9040B	
280-80273-2	MW-8	Total/NA	Ground Water	9040B	
280-80273-3	MW-9	Total/NA	Ground Water	9040B	
280-80273-4	MW-10	Total/NA	Ground Water	9040B	
280-80273-5	MW-13	Total/NA	Water	9040B	
280-80273-6	MW-9D	Total/NA	Ground Water	9040B	
280-80273-7	MW-10EB	Total/NA	Ground Water	9040B	
LCS 280-315914/4	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 316298

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	9056A	
280-80273-1	MW-7	Total/NA	Ground Water	9056A	
280-80273-2	MW-8	Total/NA	Ground Water	9056A	
280-80273-2	MW-8	Total/NA	Ground Water	9056A	
280-80273-3	MW-9	Total/NA	Ground Water	9056A	
280-80273-3	MW-9	Total/NA	Ground Water	9056A	
280-80273-4	MW-10	Total/NA	Ground Water	9056A	
280-80273-4	MW-10	Total/NA	Ground Water	9056A	
280-80273-5	MW-13	Total/NA	Water	9056A	
280-80273-5	MW-13	Total/NA	Water	9056A	
280-80273-6	MW-9D	Total/NA	Ground Water	9056A	
280-80273-6	MW-9D	Total/NA	Ground Water	9056A	
280-80273-7	MW-10EB	Total/NA	Ground Water	9056A	
LCS 280-316298/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-316298/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 280-316298/6	Method Blank	Total/NA	Water	9056A	
MRL 280-316298/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 239583

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	PrecSep-21	
280-80273-2	MW-8	Total/NA	Ground Water	PrecSep-21	
280-80273-3	MW-9	Total/NA	Ground Water	PrecSep-21	
LCS 160-239583/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-239583/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-239583/1-A	Method Blank	Total/NA	Water	PrecSep-21	

### Prep Batch: 239587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-4	MW-10	Total/NA	Ground Water	PrecSep-21	
280-80273-5	MW-13	Total/NA	Water	PrecSep-21	
280-80273-6	MW-9D	Total/NA	Ground Water	PrecSep-21	
280-80273-7	MW-10EB	Total/NA	Ground Water	PrecSep-21	
LCS 160-239587/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
MB 160-239587/1-A	Method Blank	Total/NA	Water	PrecSep-21	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-80273-1

## Rad (Continued)

### Prep Batch: 239659

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-4	MW-10	Total/NA	Ground Water	PrecSep_0	
280-80273-5	MW-13	Total/NA	Water	PrecSep_0	
280-80273-6	MW-9D	Total/NA	Ground Water	PrecSep_0	
280-80273-7	MW-10EB	Total/NA	Ground Water	PrecSep_0	
LCS 160-239659/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
MB 160-239659/1-A	Method Blank	Total/NA	Water	PrecSep_0	

### Prep Batch: 239662

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-80273-1	MW-7	Total/NA	Ground Water	PrecSep_0	
280-80273-2	MW-8	Total/NA	Ground Water	PrecSep_0	
280-80273-3	MW-9	Total/NA	Ground Water	PrecSep_0	
LCS 160-239662/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-239662/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-239662/1-A	Method Blank	Total/NA	Water	PrecSep_0	

# Lab Chronicle

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

TestAmerica Job ID: 280-80273-1

**Client Sample ID: MW-7**  
**Date Collected: 03/01/16 09:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-1**  
**Matrix: Ground 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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:19	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 15:40	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	223095	03/24/16 12:33	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:25	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:26	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 18:53	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	316298	03/09/16 19:11	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	25 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			250.12 mL	1.0 g	239583	03/08/16 12:46	MRB	TAL SL
Total/NA	Analysis	9315		1	250.12 mL		242942	03/30/16 07:57	RTM	TAL SL
Total/NA	Prep	PrecSep_0			250.12 mL	1.0 g	239662	03/09/16 08:31	CMC	TAL SL
Total/NA	Analysis	9320		1	250.12 mL		241800	03/23/16 12:17	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

**Client Sample ID: MW-8**  
**Date Collected: 02/29/16 15:05**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-2**  
**Matrix: Ground 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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:23	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 15:48	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	223095	03/24/16 12:37	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:32	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:15	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 20:04	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	316298	03/09/16 20:21	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.00 mL	1.0 g	239583	03/08/16 12:46	MRB	TAL SL
Total/NA	Analysis	9315		1	1000.00 mL		242942	03/30/16 07:57	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.00 mL	1.0 g	239662	03/09/16 08:31	CMC	TAL SL
Total/NA	Analysis	9320		1	1000.00 mL		241800	03/23/16 12:17	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-80273-1

**Client Sample ID: MW-9**  
**Date Collected: 03/01/16 12:15**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-3**  
**Matrix: Ground 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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:27	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 15:56	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	223095	03/24/16 12:41	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:39	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:20	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 20:39	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	316298	03/09/16 20:57	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.56 mL	1.0 g	239583	03/08/16 12:46	MRB	TAL SL
Total/NA	Analysis	9315		1	1000.56 mL		242942	03/30/16 07:58	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.56 mL	1.0 g	239662	03/09/16 08:31	CMC	TAL SL
Total/NA	Analysis	9320		1	1000.56 mL		241800	03/23/16 12:17	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

**Client Sample ID: MW-10**  
**Date Collected: 03/01/16 14:00**  
**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-4**  
**Matrix: Ground 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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:31	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 16:05	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	223095	03/24/16 12:45	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:41	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:07	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 21:14	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	316298	03/09/16 21:32	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.67 mL	1.0 g	239587	03/08/16 13:37	MRB	TAL SL
Total/NA	Analysis	9315		1	999.67 mL		242937	03/30/16 07:31	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.67 mL	1.0 g	239659	03/09/16 08:29	CMC	TAL SL
Total/NA	Analysis	9320		1	999.67 mL		242196	03/25/16 12:31	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

TestAmerica Denver



# Lab Chronicle

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

TestAmerica Job ID: 280-80273-1

**Client Sample ID: MW-13**

**Date Collected: 02/29/16 12:20**

**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-5**

**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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:35	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 16:22	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	223095	03/24/16 13:00	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:43	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:36	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 21:50	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	316298	03/09/16 22:08	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.47 mL	1.0 g	239587	03/08/16 13:37	MRB	TAL SL
Total/NA	Analysis	9315		1	1000.47 mL		242937	03/30/16 07:31	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.47 mL	1.0 g	239659	03/09/16 08:29	CMC	TAL SL
Total/NA	Analysis	9320		1	1000.47 mL		242196	03/25/16 12:31	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

**Client Sample ID: MW-9D**

**Date Collected: 03/01/16 12:15**

**Date Received: 03/01/16 15:15**

**Lab Sample ID: 280-80273-6**

**Matrix: Ground 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	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:40	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 16:30	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	223095	03/24/16 12:54	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:46	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:31	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 22:25	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	316298	03/09/16 22:43	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.19 mL	1.0 g	239587	03/08/16 13:37	MRB	TAL SL
Total/NA	Analysis	9315		1	1000.19 mL		242937	03/30/16 07:32	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.19 mL	1.0 g	239659	03/09/16 08:29	CMC	TAL SL
Total/NA	Analysis	9320		1	1000.19 mL		242196	03/25/16 12:31	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-80273-1

**Client Sample ID: MW-10EB**

**Lab Sample ID: 280-80273-7**

**Date Collected: 03/01/16 14:30**

**Matrix: Ground Water**

**Date Received: 03/01/16 15:15**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	221729	03/16/16 03:44	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	222513	03/21/16 16:39	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	220532	03/07/16 13:37	WKD	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	223095	03/24/16 13:13	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	316714	03/14/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	316886	03/14/16 18:48	CDH	TAL DEN
Total/NA	Analysis	9040B		1			315914	03/04/16 17:01	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	316298	03/09/16 23:36	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	315569	03/02/16 14:47	RSM	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	315585	03/02/16 16:26	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.97 mL	1.0 g	239587	03/08/16 13:37	MRB	TAL SL
Total/NA	Analysis	9315		1	1000.97 mL		242937	03/30/16 07:32	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.97 mL	1.0 g	239659	03/09/16 08:29	CMC	TAL SL
Total/NA	Analysis	9320		1	1000.97 mL		242196	03/25/16 12:31	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			242979	03/30/16 20:35	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



# Certification Summary

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

TestAmerica Job ID: 280-80273-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
A2LA	DoD ELAP		2907.01	10-31-17

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Ground Water	Mercury
7470A	7470A	Water	Mercury
9040B		Ground Water	Temperature
9040B		Water	Temperature
9056A		Ground Water	Chloride
9056A		Ground Water	Fluoride
9056A		Ground Water	Sulfate
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-16
Illinois	NELAP	5	200004	07-31-16
Kansas	NELAP	7	E-10336	01-31-16 *
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-16
Nevada	State Program	9	OH-000482008A	07-31-16
New Jersey	NELAP	2	OH001	06-30-16 *
New York	NELAP	2	10975	03-31-16 *
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-16
Texas	NELAP	6	T104704517-15-5	08-31-16
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16
Wisconsin	State Program	5	999518190	08-31-16

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-16
California	State Program	9	2886	03-31-18
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-16
Illinois	NELAP	5	003757	11-30-16

\* Certification renewal pending - certification considered valid.

# Certification Summary

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

TestAmerica Job ID: 280-80273-1

## Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Iowa	State Program	7	373	12-01-16
Kansas	NELAP	7	E-10236	05-31-16
Kentucky (DW)	State Program	4	90125	12-31-16
L-A-B	DoD ELAP		L2305	04-10-16 *
Louisiana	NELAP	6	04080	06-30-16
Louisiana (DW)	NELAP	6	LA160008	12-31-16
Maryland	State Program	3	310	09-30-16
Missouri	State Program	7	780	06-30-16
Nevada	State Program	9	MO000542016-1	07-31-16
New Jersey	NELAP	2	MO002	06-30-16
New York	NELAP	2	11616	03-31-16 *
North Dakota	State Program	8	R207	06-30-16
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-16
Pennsylvania	NELAP	3	68-00540	02-28-17 *
South Carolina	State Program	4	85002001	06-30-16
Texas	NELAP	6	T104704193-15-9	07-31-16
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542015-7	07-31-16
Virginia	NELAP	3	460230	06-14-16
Washington	State Program	10	C592	08-30-16
West Virginia DEP	State Program	3	381	08-31-16

\* Certification renewal pending - certification considered valid.



# Chain of Custody Record



280-80273 Chain of Custody

Client Information  
 Client Contact: Anna Lundin  
 Company: HDR Inc  
 Address: 9781 S. Meridian Blvd Suite 400  
 City: Englewood  
 State: CO, Zip: 80112  
 Phone: 720-633-2380 (Tel)  
 Email: anna.lundin@hdrinc.com  
 Project Name: Xcel Energy GW CCR Monitoring - Cherokee  
 Site: Colorado

Sampler: Justin B. ILS  
 Lab PM: Kupper, Stephanie  
 Phone: 512-331-7027  
 E-Mail: stephanie.kupper@testamericainc.com

Due Date Requested: Standard  
 TAT Requested (days):  
 PO #: DEN-001  
 WO #:  
 Project #: 28014371  
 SSOW#:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste, etc.)	Field Filtered Sample (Yes or No)		Performs MS/MS (Yes or No)		Metals - 6020A, 7470A		PH - 9040B, Anions - 9065A, 28D		2540D - Total Suspended Solids		9316, Ra226, 9320, Ra228		Total Number of Containers	Special Instructions/Note:
					N	D	N	D	N	D	N	D	N	D	N	D		
MW-7	3/1/16	0915	G	Water					1	2	1	1	2				7	
MW-8	2/29/16	1505	G	Water					1	2	1	1	2				7	
MW-9	3/1/16	1215	G	Water					1	2	1	1	2				7	
MW-10	3/1/16	1400	G	Water					1	2	1	1	2				7	
MW-13	2/29/16	0820	G	water					1	2	1	1	2				7	
MW-9D	3/1/16	1215	G	water					1	2	1	1	2				7	
MW-10EB	3/1/16	1430	G	water					1	2	1	1	2				7	

Possible Hazard Identification  
 Non-Hazard  
 Flammable  
 Skin Irritant  
 Poison B  
 Unknown  
 Radiological  
 Deliverable Requested: I, II, III, IV, Other (specify)

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: Justin B. ILS Date/Time: 3/1/16 1515  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Received by: Justin B. ILS Date/Time: 3-1-16 1515  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_  
 Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Company: HDR  
 Company: TAD  
 Company: \_\_\_\_\_

Custody Seal No.: \_\_\_\_\_  
 Custody Seals Intact:  Yes  No  
 Cooler Temperature(s) °C and Other Remarks: 3.1.1.2.9-0.2 IR#7 Transferred by JW 3/1/16

**Chain of Custody Record**



Client Information (Sub Contract Lab)		Lab PM: Kopper, Stephanie K		Carrier Tracking No(s):							
Shipping/Receiving		E-Mail: stephanie.kopper@testamericainc.com		COC No: 280-341674-1							
Company: TestAmerica Laboratories, Inc.		Due Date Requested: 3/28/2016		Page: Page 1 of 1							
Address: 13715 Rider Trail North,		TAT Requested (days):		Job #: 280-80273-1							
City: Earth City		PO #:		Preservation Codes:							
State, Zip: MO, 63045		WO #:		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: 314-298-8566(Tel) 314-298-8757(Fax)		Project #:		M - Hexane N - None O - As <sub>2</sub> O <sub>3</sub> P - Na <sub>2</sub> O <sub>4</sub> S Q - Na <sub>2</sub> SO <sub>3</sub> R - Na <sub>2</sub> S <sub>2</sub> SO <sub>3</sub> S - H <sub>2</sub> SO <sub>4</sub> T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)							
Email:		Site: Xcel Energy CCR - Cherokee Station		Special Instructions/Note:							
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		SSOW #:		Total Number of Containers							
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra228/PreSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PreSep_0 Radium-228 - 2/3 - SUB	Analysis Requested		
MW-7 (280-80273-1)	3/1/16	09:15 Mountain	Water	Water	X	X	X	X			
MW-8 (280-80273-2)	2/29/16	15:05 Mountain	Water	Water	X	X	X	X			
MW-9 (280-80273-3)	3/1/16	12:15 Mountain	Water	Water	X	X	X	X			
MW-10 (280-80273-4)	3/1/16	14:00 Mountain	Water	Water	X	X	X	X			
MW-13 (280-80273-5)	2/29/16	12:20 Mountain	Water	Water	X	X	X	X			
MW-9D (280-80273-6)	3/1/16	12:15 Mountain	Water	Water	X	X	X	X			
MW-10EB (280-80273-7)	3/1/16	14:30 Mountain	Water	Water	X	X	X	X			
<p>2 X 1L HNO<sub>3</sub> poly's          pos sample 10:6.          3-3-16</p>											
<p><b>Possible Hazard Identification</b>          Unconfirmed          Deliverable Requested: I, II, III, IV, Other (specify)</p>											
<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>											
<p>Special Instructions/QC Requirements:</p>											
Relinquished by:		Date: 3-3-16 1550		Company: TA Denver		Received by: MCK		Date/Time: 03-04-16 10:15		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:							



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

1,2,4, CO, 7

Chain of Custody Record

TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING



<b>Client Information (Sub Contract Lab)</b> Client Contact: Kupper, Stephanie K Shipping/Receiving: stephanie.kupper@testamericainc.com Company: TestAmerica Laboratories, Inc.		Lab PM: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com		Carrier Tracking No(s): COC No: 280-341673-1 Page: 1 of 1				
Due Date Requested: 3/24/2016 TAT Requested (days): PO #: 330-497-9396(Tel) 330-497-0772(Fax) WO #: Project #: 28014371 SSOW#:		<b>Analysis Requested</b> 6020A/3005A 14 Metals (Includes B and Ca) - 1/2 SUB 5300 5000						
Sample ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=other, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of Containers	Special Instructions/Note:
MW-7 (280-80273-1)	3/1/16	09:15	Mountain	Water	X	X		Use Collision Cell 18500
MW-8 (280-80273-2)	2/29/16	15:05	Mountain	Water	X	X		Use Collision Cell
MW-9 (280-80273-3)	3/1/16	12:15	Mountain	Water	X	X		Use Collision Cell
MW-10 (280-80273-4)	3/1/16	14:00	Mountain	Water	X	X		Use Collision Cell
MW-13 (280-80273-5)	2/29/16	12:20	Mountain	Water	X	X		Use Collision Cell
MW-9D (280-80273-6)	3/1/16	12:15	Mountain	Water	X	X		Use Collision Cell
MW-10EB (280-80273-7)	3/1/16	14:30	Mountain	Water	X	X		Use Collision Cell
1 x 500 mL H <sub>2</sub> O <sub>3</sub> poly per sample 9-6- 3-3-16								
<b>Possible Hazard Identification</b> Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)								
Empty Kit Relinquished by: Relinquished by: [Signature] Date/Time: 3-23-16 1550		Relinquished by: [Signature] Date/Time: 3-24-16 9:30 am		Method of Shipment: Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months		Company: [Signature] Date/Time: 3-24-16 9:30 am		Company: [Signature]
Relinquished by: [Signature] Date/Time:		Relinquished by: [Signature] Date/Time:		Relinquished by: [Signature] Date/Time:		Relinquished by: [Signature] Date/Time:		Relinquished by: [Signature]
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:				





TestAmerica Canton Sample Receipt Form/Narrative		Login # _____
Canton Facility _____		
Client <u>TA Denver</u>	Site Name _____	Cooler unpacked by: <u>Gennystiller</u>
Cooler Received on <u>3-4-16</u>	Opened on <u>3-4-16</u>	
FedEx: 1 <sup>st</sup> Grd <input checked="" type="checkbox"/> UPS FAS Stetson Client Drop Off TestAmerica Courier Other _____		
Receipt After-hours: Drop-off Date/Time _____		Storage Location _____
TestAmerica Cooler # _____ Foam Box <input checked="" type="checkbox"/> Client Cooler _____ Box _____ Other _____		
Packing material used: <input checked="" type="checkbox"/> Bubble Wrap _____ Foam _____ Plastic Bag _____ None _____ Other _____		
COOLANT: <input checked="" type="checkbox"/> Wet Ice _____ Blue Ice _____ Dry Ice _____ Water _____ None _____		
1. Cooler temperature upon receipt		<input type="checkbox"/> See Multiple Cooler Form
IR GUN# 48 (CF -1.9 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C		
IR GUN# 36 (CF -1.5 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C		
IR GUN# 18 (CF -0.5 °C) Observed Cooler Temp. <u>1.2</u> °C Corrected Cooler Temp. <u>0.7</u> °C		
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity <u>1</u>		<input checked="" type="radio"/> Yes <input type="radio"/> No
-Were custody seals on the outside of the cooler(s) signed & dated?		<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> NA
-Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?		<input type="radio"/> Yes <input checked="" type="radio"/> No
3. Shippers' packing slip attached to the cooler(s)?		<input checked="" type="radio"/> Yes <input type="radio"/> No
4. Did custody papers accompany the sample(s)?		<input checked="" type="radio"/> Yes <input type="radio"/> No
5. Were the custody papers relinquished & signed in the appropriate place?		<input checked="" type="radio"/> Yes <input type="radio"/> No
6. Was/were the person(s) who collected the samples clearly identified on the COC?		<input type="radio"/> Yes <input checked="" type="radio"/> No
7. Did all bottles arrive in good condition (Unbroken)?		<input checked="" type="radio"/> Yes <input type="radio"/> No
8. Could all bottle labels be reconciled with the COC?		<input checked="" type="radio"/> Yes <input type="radio"/> No
9. Were correct bottle(s) used for the test(s) indicated?		<input checked="" type="radio"/> Yes <input type="radio"/> No
10. Sufficient quantity received to perform indicated analyses?		<input checked="" type="radio"/> Yes <input type="radio"/> No
11. Are these work share samples?		<input checked="" type="radio"/> Yes <input type="radio"/> No
<i>If yes, Questions 12-16 have been checked at the originating laboratory.</i>		
12. Were sample(s) at the correct pH upon receipt?		Yes No NA pH Strip Lot# <u>HC559158</u>
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 # _____		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 _____		

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by: _____
<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>	

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: 280-80273-1

**Login Number: 80273**

**List Number: 1**

**Creator: White, Denise E**

**List Source: TestAmerica Denver**

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



# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-80273-1

**Login Number: 80273**  
**List Number: 2**  
**Creator: McKinney, Gerrod E**

**List Source: TestAmerica St. Louis**  
**List Creation: 03/04/16 12:03 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3, 1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-80273-1

**Login Number: 80273**  
**List Number: 3**  
**Creator: McKinney, Gerrod E**

**List Source: TestAmerica St. Louis**  
**List Creation: 03/04/16 12:04 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.3, 1.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-80273-1

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

Matrix: Ground Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-80273-1	MW-7	84.0
280-80273-2	MW-8	93.4
280-80273-3	MW-9	101
280-80273-4	MW-10	93.2
280-80273-6	MW-9D	103
280-80273-7	MW-10EB	103

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-80273-5	MW-13	100
LCS 160-239583/2-A	Lab Control Sample	107
LCS 160-239587/2-A	Lab Control Sample	104
LCSD 160-239583/3-A	Lab Control Sample Dup	103
MB 160-239583/1-A	Method Blank	103
MB 160-239587/1-A	Method Blank	98.0

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Ground Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-80273-1	MW-7	84.0	84.9
280-80273-2	MW-8	93.4	77.8
280-80273-3	MW-9	101	83.4
280-80273-4	MW-10	93.2	82.6
280-80273-6	MW-9D	103	92.3
280-80273-7	MW-10EB	103	93.5

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-80273-5	MW-13	100	87.5

TestAmerica Denver

# Tracer/Carrier Summary

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

TestAmerica Job ID: 280-80273-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
LCS 160-239659/2-A	Lab Control Sample	104	87.9
LCS 160-239662/2-A	Lab Control Sample	107	80.7
LCSD 160-239662/3-A	Lab Control Sample Dup	103	81.9
MB 160-239659/1-A	Method Blank	98.0	86.0
MB 160-239662/1-A	Method Blank	103	80.4

### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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

# 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: 280-82792-1

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:

6/6/2016 2:29:31 PM

Stephanie Kupper, Project Manager I

(303)736-0182

[stephanie.kupper@testamericainc.com](mailto:stephanie.kupper@testamericainc.com)

### LINKS

Review your project  
results through

TotalAccess

Have a Question?



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[www.testamericainc.com](http://www.testamericainc.com)

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

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 280-82792-1

## 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
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-82792-1

**Job ID: 280-82792-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-82792-1**

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

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

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

### **RECEIPT**

The samples were received on 5/5/2016 at 2:55 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 9.7° C, 12.0° C and 20.5° C.

All three coolers arrived above the recommended 6.0C due to not enough ice in the coolers.

### **TOTAL RECOVERABLE METALS (ICPMS)**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/10/2016 and analyzed on 05/23/2016.

Calcium failed the recovery criteria low for the MS and MSD of sample 190-10542-11 in batch 240-231186. 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-7 (280-82792-1)[20X], MW-8 (280-82792-2)[50X], MW-9 (280-82792-3)[50X], MW-10 (280-82792-4)[20X], MW-13D (280-82792-5)[10X] and MW-13 (280-82792-7)[10X] 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.

### **TOTAL MERCURY**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 05/16/2016.

Mercury failed the recovery criteria low for the MSD of sample 280-82715-2 in batch 280-325636. 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 DISSOLVED SOLIDS**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 05/09/2016 and 05/10/2016.



# Case Narrative

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

TestAmerica Job ID: 280-82792-1

## Job ID: 280-82792-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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

#### **TOTAL SUSPENDED SOLIDS**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 05/09/2016.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 280-82870-1. Sample results were below the method detection limit, so the RPD is not an accurate reflection of the data.

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

#### **CORROSIVITY (PH)**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 05/05/2016 and 05/07/2016.

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

#### **ANIONS (28 DAYS)**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 05/19/2016 and 05/20/2016.

Samples MW-7 (280-82792-1)[5X], MW-8 (280-82792-2)[10X], MW-9 (280-82792-3)[20X], MW-10 (280-82792-4)[10X], MW-13D (280-82792-5)[5X] and MW-13 (280-82792-7)[5X] 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 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 05/11/2016 and analyzed on 06/02/2016.

A deviation from the Standard Operating Procedure (SOP) occurred. Samples were re-prepared as follows: Precipitate on planchette was re-dissolved with EDTA, moved to a centrifuge tube, added standardized yttrium carrier and lead carrier. Samples were placed into a "re-ingrowth" period of at least 36 hours. This is to ensure proper separation of the yttrium oxalate and the barium sulfate which was believed to not have fully separated causing a high radium-228 spike recovery. New T1 times were recorded for the actinium-228, but not for the radium-226. Original T1 time will be used for the radium-226 portion as recorded in TALs. The following samples are impacted: MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6), MW-13 (280-82792-7).

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

#### **RADIUM-228**

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 05/25/2016 and analyzed on 06/02/2016.

A deviation from the Standard Operating Procedure (SOP) occurred. Samples were re-prepared as follows: Precipitate on planchette was re-dissolved with EDTA, moved to a centrifuge tube, added standardized yttrium carrier and lead carrier. Samples were placed into a "re-ingrowth" period of at least 36 hours. This is to ensure proper separation of the yttrium oxalate and the barium sulfate which was believed to not have fully separated causing a high radium-228 spike recovery. New T1 times were recorded for the actinium-228, but not for the radium-226. Original T1 time will be used for the radium-226 portion as recorded in TALs. The following samples are impacted:

# Case Narrative

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

TestAmerica Job ID: 280-82792-1

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## Job ID: 280-82792-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6), MW-13 (280-82792-7).

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6), MW-13 (280-82792-7). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead.

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

### RADIUM-226/RADIUM-228 (GFPC)

Samples MW-7 (280-82792-1), MW-8 (280-82792-2), MW-9 (280-82792-3), MW-10 (280-82792-4), MW-13D (280-82792-5), MW-10EB (280-82792-6) and MW-13 (280-82792-7) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 06/05/2016.

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: 280-82792-1

## Client Sample ID: MW-7

## Lab Sample ID: 280-82792-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00033	J	0.0020	0.00016	mg/L	1		6020A	Total
Arsenic	0.0013	J	0.0050	0.00049	mg/L	1		6020A	Recoverable Total
Barium	0.048		0.0050	0.0011	mg/L	1		6020A	Recoverable Total
Boron	1.5		0.40	0.22	mg/L	20		6020A	Recoverable Total
Cadmium	0.000098	J	0.0010	0.000061	mg/L	1		6020A	Recoverable Total
Calcium	190		1.0	0.24	mg/L	1		6020A	Recoverable Total
Chromium	0.0023		0.0020	0.00060	mg/L	1		6020A	Recoverable Total
Cobalt	0.00045	J	0.0010	0.000021	mg/L	1		6020A	Recoverable Total
Lead	0.00040	J	0.0010	0.00011	mg/L	1		6020A	Recoverable Total
Lithium	0.039		0.0080	0.00029	mg/L	1		6020A	Recoverable Total
Molybdenum	0.012		0.010	0.00023	mg/L	1		6020A	Recoverable Total
Selenium	0.010		0.0050	0.00025	mg/L	1		6020A	Recoverable Total
pH adj. to 25 deg C	7.35	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.3	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	550		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	440		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1800		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.6		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-8

## Lab Sample ID: 280-82792-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.00020	J	0.0020	0.00016	mg/L	1		6020A	Total
Arsenic	0.0017	J	0.0050	0.00049	mg/L	1		6020A	Recoverable Total
Barium	0.041		0.0050	0.0011	mg/L	1		6020A	Recoverable Total
Boron	3.0		1.0	0.55	mg/L	50		6020A	Recoverable Total
Cadmium	0.00089	J	0.0010	0.000061	mg/L	1		6020A	Recoverable Total
Calcium	420		1.0	0.24	mg/L	1		6020A	Recoverable Total
Chromium	0.0011	J	0.0020	0.00060	mg/L	1		6020A	Recoverable Total
Cobalt	0.0029		0.0010	0.000021	mg/L	1		6020A	Recoverable Total
Lithium	0.090		0.0080	0.00029	mg/L	1		6020A	Recoverable Total
Molybdenum	0.055		0.010	0.00023	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: 280-82792-1

## Client Sample ID: MW-8 (Continued)

## Lab Sample ID: 280-82792-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.016		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.58	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.3	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	430		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1500		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	3.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9

## Lab Sample ID: 280-82792-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0035		0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0052		0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.061		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Boron	2.6		1.0	0.55	mg/L	50		6020A	Total Recoverable
Cadmium	0.0015		0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	380		1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00093	J	0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.0043		0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.0016		0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.17		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.041		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0085		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.24	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.1	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	790		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	2.6		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1400		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	3400		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

## Client Sample ID: MW-10

## Lab Sample ID: 280-82792-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0025		0.0020	0.00016	mg/L	1		6020A	Total Recoverable
Arsenic	0.0030	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.075		0.0050	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: 280-82792-1

## Client Sample ID: MW-10 (Continued)

## Lab Sample ID: 280-82792-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.8		0.40	0.22	mg/L	20		6020A	Total Recoverable
Cadmium	0.00062	J	0.0010	0.000061	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.24	mg/L	1		6020A	Total Recoverable
Chromium	0.00092	J	0.0020	0.00060	mg/L	1		6020A	Total Recoverable
Cobalt	0.0022		0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lead	0.00020	J	0.0010	0.00011	mg/L	1		6020A	Total Recoverable
Lithium	0.14		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.035		0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0054		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.80	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.4	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	560		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1100		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2500		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	64		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13D

## Lab Sample ID: 280-82792-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00051	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.080		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Boron	0.72		0.20	0.11	mg/L	10		6020A	Total Recoverable
Calcium	120		1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.00029	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lithium	0.041		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0060		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.61	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.5	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	210		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	160		5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	910		10	4.7	mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-10EB

## Lab Sample ID: 280-82792-6

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: 280-82792-1

## Client Sample ID: MW-10EB (Continued)

Lab Sample ID: 280-82792-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
pH adj. to 25 deg C	5.86	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	19.7	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Total Dissolved Solids (TDS)	6.0	J	10	4.7	mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-13

Lab Sample ID: 280-82792-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00049	J	0.0050	0.00049	mg/L	1		6020A	Total Recoverable
Barium	0.078		0.0050	0.0011	mg/L	1		6020A	Total Recoverable
Boron	0.71		0.20	0.11	mg/L	10		6020A	Total Recoverable
Calcium	120		1.0	0.24	mg/L	1		6020A	Total Recoverable
Cobalt	0.00031	J	0.0010	0.000021	mg/L	1		6020A	Total Recoverable
Lithium	0.042		0.0080	0.00029	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0034	J	0.010	0.00023	mg/L	1		6020A	Total Recoverable
Selenium	0.0058		0.0050	0.00025	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.63	HF	0.100	0.100	SU	1		9040B	Total/NA
Temperature	22.0	HF	1.00	1.00	Degrees C	1		9040B	Total/NA
Chloride	210		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	160		5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	890		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	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: 280-82792-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-82792-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-82792-1	MW-7	Ground Water	05/04/16 12:15	05/05/16 14:55
280-82792-2	MW-8	Ground Water	05/04/16 14:00	05/05/16 14:55
280-82792-3	MW-9	Ground Water	05/05/16 10:15	05/05/16 14:55
280-82792-4	MW-10	Ground Water	05/05/16 13:30	05/05/16 14:55
280-82792-5	MW-13D	Water	05/04/16 10:30	05/05/16 14:55
280-82792-6	MW-10EB	Ground Water	05/05/16 13:50	05/05/16 14:55
280-82792-7	MW-13	Water	05/04/16 10:30	05/05/16 14:55

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# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00033	J	0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 18:52	1
Arsenic	0.0013	J	0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 18:52	1
Barium	0.048		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 18:52	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 18:52	1
Boron	1.5		0.40	0.22	mg/L		05/10/16 11:51	05/23/16 16:26	20
Cadmium	0.000098	J	0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 18:52	1
Calcium	190		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 18:52	1
Chromium	0.0023		0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 18:52	1
Cobalt	0.00045	J	0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 18:52	1
Lead	0.00040	J	0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 18:52	1
Lithium	0.039		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 18:52	1
Molybdenum	0.012		0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 18:52	1
Selenium	0.010		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 18:52	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 18:52	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00020	J	0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 18:56	1
Arsenic	0.0017	J	0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 18:56	1
Barium	0.041		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 18:56	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 18:56	1
Boron	3.0		1.0	0.55	mg/L		05/10/16 11:51	05/23/16 16:39	50
Cadmium	0.00089	J	0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 18:56	1
Calcium	420		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 18:56	1
Chromium	0.0011	J	0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 18:56	1
Cobalt	0.0029		0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 18:56	1
Lead	ND		0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 18:56	1
Lithium	0.090		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 18:56	1
Molybdenum	0.055		0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 18:56	1
Selenium	0.016		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 18:56	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 18:56	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0035		0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 19:00	1
Arsenic	0.0052		0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 19:00	1
Barium	0.061		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 19:00	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 19:00	1
Boron	2.6		1.0	0.55	mg/L		05/10/16 11:51	05/23/16 16:43	50
Cadmium	0.0015		0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 19:00	1
Calcium	380		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 19:00	1
Chromium	0.00093	J	0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 19:00	1
Cobalt	0.0043		0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 19:00	1
Lead	0.0016		0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 19:00	1
Lithium	0.17		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 19:00	1
Molybdenum	0.041		0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 19:00	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.0085		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 19:00	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 19:00	1

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0025		0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 19:04	1
Arsenic	0.0030	J	0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 19:04	1
Barium	0.075		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 19:04	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 19:04	1
Boron	1.8		0.40	0.22	mg/L		05/10/16 11:51	05/23/16 16:47	20
Cadmium	0.00062	J	0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 19:04	1
Calcium	300		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 19:04	1
Chromium	0.00092	J	0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 19:04	1
Cobalt	0.0022		0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 19:04	1
Lead	0.00020	J	0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 19:04	1
Lithium	0.14		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 19:04	1
Molybdenum	0.035		0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 19:04	1
Selenium	0.0054		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 19:04	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 19:04	1

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 19:08	1
Arsenic	0.00051	J	0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 19:08	1
Barium	0.080		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 19:08	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 19:08	1
Boron	0.72		0.20	0.11	mg/L		05/10/16 11:51	05/23/16 16:51	10
Cadmium	ND		0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 19:08	1
Calcium	120		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 19:08	1
Chromium	ND		0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 19:08	1
Cobalt	0.00029	J	0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 19:08	1
Lead	ND		0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 19:08	1
Lithium	0.041		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 19:08	1
Molybdenum	0.0034	J	0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 19:08	1
Selenium	0.0060		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 19:08	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 19:08	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 16:56	1
Arsenic	ND		0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 16:56	1
Barium	ND		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 16:56	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 16:56	1
Boron	ND		0.020	0.011	mg/L		05/10/16 11:51	05/23/16 16:56	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cadmium	ND		0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 16:56	1
Calcium	ND		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 16:56	1
Chromium	ND		0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 16:56	1
Cobalt	ND		0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 16:56	1
Lead	ND		0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 16:56	1
Lithium	ND		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 16:56	1
Molybdenum	ND		0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 16:56	1
Selenium	ND		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 16:56	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 16:56	1

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Arsenic</b>	<b>0.00049</b>	<b>J</b>	0.0050	0.00049	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Barium</b>	<b>0.078</b>		0.0050	0.0011	mg/L		05/10/16 11:51	05/23/16 19:12	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Boron</b>	<b>0.71</b>		0.20	0.11	mg/L		05/10/16 11:51	05/23/16 17:00	10
Cadmium	ND		0.0010	0.000061	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Calcium</b>	<b>120</b>		1.0	0.24	mg/L		05/10/16 11:51	05/23/16 19:12	1
Chromium	ND		0.0020	0.00060	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Cobalt</b>	<b>0.00031</b>	<b>J</b>	0.0010	0.000021	mg/L		05/10/16 11:51	05/23/16 19:12	1
Lead	ND		0.0010	0.00011	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Lithium</b>	<b>0.042</b>		0.0080	0.00029	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Molybdenum</b>	<b>0.0034</b>	<b>J</b>	0.010	0.00023	mg/L		05/10/16 11:51	05/23/16 19:12	1
<b>Selenium</b>	<b>0.0058</b>		0.0050	0.00025	mg/L		05/10/16 11:51	05/23/16 19:12	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/23/16 19:12	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:09	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:11	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:13	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:16	1

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:23	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:25	1

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 20:27	1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.35	HF	0.100	0.100	SU			05/05/16 22:22	1
Temperature	22.3	HF	1.00	1.00	Degrees C			05/05/16 22:22	1
Chloride	550		15	1.3	mg/L			05/19/16 23:46	5
Fluoride	1.3		0.50	0.060	mg/L			05/19/16 23:29	1
Sulfate	440		25	1.2	mg/L			05/19/16 23:46	5
Total Dissolved Solids (TDS)	1800		20	9.4	mg/L			05/09/16 12:28	1
Total Suspended Solids	5.6		4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.58	HF	0.100	0.100	SU			05/05/16 22:08	1
Temperature	22.3	HF	1.00	1.00	Degrees C			05/05/16 22:08	1
Chloride	430		30	2.5	mg/L			05/20/16 00:19	10
Fluoride	1.3		0.50	0.060	mg/L			05/20/16 00:02	1
Sulfate	1500		50	2.3	mg/L			05/20/16 00:19	10
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			05/09/16 12:28	1
Total Suspended Solids	3.2	J	4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.24	HF	0.100	0.100	SU			05/05/16 22:26	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

## General Chemistry (Continued)

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	22.1	HF	1.00	1.00	Degrees C			05/05/16 22:26	1
Chloride	790		60	5.1	mg/L			05/20/16 00:53	20
Fluoride	2.6		0.50	0.060	mg/L			05/20/16 00:36	1
Sulfate	1400		100	4.6	mg/L			05/20/16 00:53	20
Total Dissolved Solids (TDS)	3400		20	9.4	mg/L			05/10/16 12:00	1
Total Suspended Solids	4.8		4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.80	HF	0.100	0.100	SU			05/05/16 22:17	1
Temperature	22.4	HF	1.00	1.00	Degrees C			05/05/16 22:17	1
Chloride	560		30	2.5	mg/L			05/20/16 01:26	10
Fluoride	2.0		0.50	0.060	mg/L			05/20/16 01:10	1
Sulfate	1100		50	2.3	mg/L			05/20/16 01:26	10
Total Dissolved Solids (TDS)	2500		20	9.4	mg/L			05/10/16 12:00	1
Total Suspended Solids	64		4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.61	HF	0.100	0.100	SU			05/05/16 22:14	1
Temperature	22.5	HF	1.00	1.00	Degrees C			05/05/16 22:14	1
Chloride	210		15	1.3	mg/L			05/20/16 02:00	5
Fluoride	1.2		0.50	0.060	mg/L			05/20/16 01:43	1
Sulfate	160		5.0	0.23	mg/L			05/20/16 01:43	1
Total Dissolved Solids (TDS)	910		10	4.7	mg/L			05/10/16 12:00	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	5.86	HF	0.100	0.100	SU			05/07/16 14:44	1
Temperature	19.7	HF	1.00	1.00	Degrees C			05/07/16 14:44	1
Chloride	ND		3.0	0.25	mg/L			05/20/16 02:50	1
Fluoride	ND		0.50	0.060	mg/L			05/20/16 02:50	1
Sulfate	ND		5.0	0.23	mg/L			05/20/16 02:50	1
Total Dissolved Solids (TDS)	6.0	J	10	4.7	mg/L			05/10/16 12:00	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/09/16 15:39	1

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.63	HF	0.100	0.100	SU			05/05/16 22:38	1
Temperature	22.0	HF	1.00	1.00	Degrees C			05/05/16 22:38	1
Chloride	210		15	1.3	mg/L			05/20/16 03:24	5

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

## General Chemistry (Continued)

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	1.2		0.50	0.060	mg/L			05/20/16 03:07	1
Sulfate	160		5.0	0.23	mg/L			05/20/16 03:07	1
Total Dissolved Solids (TDS)	890		10	4.7	mg/L			05/10/16 12:00	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			05/09/16 15:39	1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.249		0.0660	0.0697	1.00	0.0493	pCi/L	05/11/16 18:00	06/02/16 07:52	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	69.2		40 - 110					05/11/16 18:00	06/02/16 07:52	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.233		0.0751	0.0780	1.00	0.0839	pCi/L	05/11/16 18:00	06/02/16 07:52	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	67.2		40 - 110					05/11/16 18:00	06/02/16 07:52	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.135		0.0620	0.0632	1.00	0.0826	pCi/L	05/11/16 18:00	06/02/16 07:52	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	72.4		40 - 110					05/11/16 18:00	06/02/16 07:52	1

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.110		0.0526	0.0535	1.00	0.0673	pCi/L	05/11/16 18:00	06/02/16 07:52	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	67.8		40 - 110					05/11/16 18:00	06/02/16 07:52	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.230		0.0648	0.0680	1.00	0.0641	pCi/L	05/11/16 18:00	06/02/16 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	78.3		40 - 110					05/11/16 18:00	06/02/16 07:53	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00229	U	0.0311	0.0311	1.00	0.0617	pCi/L	05/11/16 18:00	06/02/16 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	69.5		40 - 110					05/11/16 18:00	06/02/16 07:53	1

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.220		0.0665	0.0694	1.00	0.0611	pCi/L	05/11/16 18:00	06/02/16 07:53	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	65.0		40 - 110					05/11/16 18:00	06/02/16 07:53	1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.524	U	0.410	0.412	1.00	0.647	pCi/L	05/25/16 18:35	06/02/16 14:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.2		40 - 110					05/25/16 18:35	06/02/16 14:32	1
Y Carrier	94.2		40 - 110					05/25/16 18:35	06/02/16 14:32	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.522	U	0.434	0.436	1.00	0.691	pCi/L	05/25/16 18:35	06/02/16 14:46	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.6		40 - 110	05/25/16 18:35	06/02/16 14:46	1
Y Carrier	95.0		40 - 110	05/25/16 18:35	06/02/16 14:46	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.868		0.467	0.473	1.00	0.698	pCi/L	05/25/16 18:35	06/02/16 14:32	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.0		40 - 110	05/25/16 18:35	06/02/16 14:32	1
Y Carrier	92.0		40 - 110	05/25/16 18:35	06/02/16 14:32	1

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.594	U	0.417	0.421	1.00	0.649	pCi/L	05/25/16 18:35	06/02/16 14:33	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	99.4		40 - 110	05/25/16 18:35	06/02/16 14:33	1
Y Carrier	90.1		40 - 110	05/25/16 18:35	06/02/16 14:33	1

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.218	U	0.366	0.367	1.00	0.621	pCi/L	05/25/16 18:35	06/02/16 14:33	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110	05/25/16 18:35	06/02/16 14:33	1
Y Carrier	89.7		40 - 110	05/25/16 18:35	06/02/16 14:33	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.161	U	0.370	0.370	1.00	0.637	pCi/L	05/25/16 18:35	06/02/16 14:28	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.4		40 - 110	05/25/16 18:35	06/02/16 14:28	1
Y Carrier	90.8		40 - 110	05/25/16 18:35	06/02/16 14:28	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>1.01</b>		0.443	0.453	1.00	0.627	pCi/L	05/25/16 18:35	06/02/16 14:28	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.2		40 - 110					05/25/16 18:35	06/02/16 14:28	1
Y Carrier	93.1		40 - 110					05/25/16 18:35	06/02/16 14:28	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.772</b>		0.415	0.418	5.00	0.647	pCi/L		06/05/16 23:05	1

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.756</b>		0.440	0.443	5.00	0.691	pCi/L		06/05/16 23:05	1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>1.00</b>		0.471	0.478	5.00	0.698	pCi/L		06/05/16 23:05	1

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Combined Radium 226 + 228</b>	<b>0.704</b>		0.420	0.424	5.00	0.649	pCi/L		06/05/16 23:05	1

# Client Sample Results

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

TestAmerica Job ID: 280-82792-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-13D**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.448	U	0.372	0.373	5.00	0.621	pCi/L		06/05/16 23:05	1

**Client Sample ID: MW-10EB**  
**Date Collected: 05/05/16 13:50**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.163	U	0.371	0.371	5.00	0.637	pCi/L		06/05/16 23:05	1

**Client Sample ID: MW-13**  
**Date Collected: 05/04/16 10:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.23		0.448	0.458	5.00	0.627	pCi/L		06/05/16 23:05	1

# QC Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Lab Sample ID: MB 240-229647/1-A**  
**Matrix: Water**  
**Analysis Batch: 232005**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 229647**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00016	mg/L		05/10/16 11:51	05/25/16 13:01	1
Arsenic	ND		0.0050	0.00049	mg/L		05/10/16 11:51	05/25/16 13:01	1
Barium	ND		0.0050	0.0011	mg/L		05/10/16 11:51	05/25/16 13:01	1
Beryllium	ND		0.0010	0.000053	mg/L		05/10/16 11:51	05/25/16 13:01	1
Boron	ND		0.020	0.011	mg/L		05/10/16 11:51	05/25/16 13:01	1
Cadmium	ND		0.0010	0.000061	mg/L		05/10/16 11:51	05/25/16 13:01	1
Calcium	ND		1.0	0.24	mg/L		05/10/16 11:51	05/25/16 13:01	1
Chromium	ND		0.0020	0.00060	mg/L		05/10/16 11:51	05/25/16 13:01	1
Cobalt	ND		0.0010	0.000021	mg/L		05/10/16 11:51	05/25/16 13:01	1
Lead	ND		0.0010	0.00011	mg/L		05/10/16 11:51	05/25/16 13:01	1
Lithium	ND		0.0080	0.00029	mg/L		05/10/16 11:51	05/25/16 13:01	1
Molybdenum	ND		0.010	0.00023	mg/L		05/10/16 11:51	05/25/16 13:01	1
Selenium	ND		0.0050	0.00025	mg/L		05/10/16 11:51	05/25/16 13:01	1
Thallium	ND		0.0010	0.000074	mg/L		05/10/16 11:51	05/25/16 13:01	1

**Lab Sample ID: LCS 240-229647/2-A**  
**Matrix: Water**  
**Analysis Batch: 232005**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 229647**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.100	0.101		mg/L		101	80 - 120
Arsenic	1.00	1.01		mg/L		101	80 - 120
Barium	1.00	1.02		mg/L		102	80 - 120
Beryllium	1.00	1.04		mg/L		104	80 - 120
Boron	0.100	0.103		mg/L		103	80 - 120
Cadmium	1.00	1.04		mg/L		104	80 - 120
Calcium	10.0	10.7		mg/L		107	80 - 120
Chromium	1.00	1.04		mg/L		104	80 - 120
Cobalt	1.00	1.05		mg/L		105	80 - 120
Lead	1.00	1.05		mg/L		105	80 - 120
Lithium	0.100	0.102		mg/L		102	80 - 120
Molybdenum	0.100	0.102		mg/L		102	80 - 120
Selenium	1.00	1.02		mg/L		102	80 - 120
Thallium	0.250	0.260		mg/L		104	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-325165/1-A**  
**Matrix: Water**  
**Analysis Batch: 325636**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 325165**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		05/16/16 11:55	05/16/16 19:33	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-82792-1

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID:** LCS 280-325165/2-A  
**Matrix:** Water  
**Analysis Batch:** 325636

**Client Sample ID:** Lab Control Sample  
**Prep Type:** Total/NA  
**Prep Batch:** 325165

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	5.00	5.19		ug/L		104	84 - 120

**Lab Sample ID:** LCSD 280-325165/3-A  
**Matrix:** Water  
**Analysis Batch:** 325636

**Client Sample ID:** Lab Control Sample Dup  
**Prep Type:** Total/NA  
**Prep Batch:** 325165

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	5.00	5.19		ug/L		104	84 - 120	0	15

## Method: 9040B - pH

**Lab Sample ID:** LCS 280-324141/4  
**Matrix:** Water  
**Analysis Batch:** 324141

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
pH adj. to 25 deg C	7.00	6.980		SU		100	99 - 101

**Lab Sample ID:** LCS 280-324672/4  
**Matrix:** Water  
**Analysis Batch:** 324672

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
pH adj. to 25 deg C	7.00	6.980		SU		100	99 - 101

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID:** MB 280-326042/6  
**Matrix:** Water  
**Analysis Batch:** 326042

**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			05/19/16 11:17	1
Fluoride	ND		0.50	0.060	mg/L			05/19/16 11:17	1
Sulfate	ND		5.0	0.23	mg/L			05/19/16 11:17	1

**Lab Sample ID:** LCS 280-326042/4  
**Matrix:** Water  
**Analysis Batch:** 326042

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Chloride	100	98.3		mg/L		98	90 - 110
Fluoride	5.00	5.11		mg/L		102	90 - 110
Sulfate	100	98.3		mg/L		98	90 - 110

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-82792-1

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

**Lab Sample ID: LCSD 280-326042/5**  
**Matrix: Water**  
**Analysis Batch: 326042**

**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	98.4		mg/L		98	90 - 110	0	10
Fluoride	5.00	5.11		mg/L		102	90 - 110	0	10
Sulfate	100	98.5		mg/L		98	90 - 110	0	10

**Lab Sample ID: MRL 280-326042/3**  
**Matrix: Water**  
**Analysis Batch: 326042**

**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	2.50	J	mg/L		100	50 - 150		
Fluoride	0.200	0.185	J	mg/L		92	50 - 150		
Sulfate	2.50	2.52	J	mg/L		101	50 - 150		

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

**Lab Sample ID: MB 280-324466/1**  
**Matrix: Water**  
**Analysis Batch: 324466**

**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			05/09/16 12:28	1

**Lab Sample ID: LCS 280-324466/2**  
**Matrix: Water**  
**Analysis Batch: 324466**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	501	492		mg/L		98	86 - 110		

**Lab Sample ID: 280-82792-2 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 324466**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	3000		3020		mg/L				

**Lab Sample ID: MB 280-324647/1**  
**Matrix: Water**  
**Analysis Batch: 324647**

**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			05/10/16 12:00	1

**Lab Sample ID: LCS 280-324647/2**  
**Matrix: Water**  
**Analysis Batch: 324647**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	501	496		mg/L		99	86 - 110		

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# QC Sample Results

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

TestAmerica Job ID: 280-82792-1

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

Lab Sample ID: 280-82792-7 DU  
Matrix: Water  
Analysis Batch: 324647

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
Total Dissolved Solids (TDS)	890		888		mg/L		0.3	10

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

Lab Sample ID: MB 280-324515/3  
Matrix: Water  
Analysis Batch: 324515

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			05/09/16 15:39	1

Lab Sample ID: LCS 280-324515/1  
Matrix: Water  
Analysis Batch: 324515

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	94.4		mg/L		94	86 - 114

Lab Sample ID: LCSD 280-324515/2  
Matrix: Water  
Analysis Batch: 324515

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Total Suspended Solids	100	92.0		mg/L		92	86 - 114	3	20

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

Lab Sample ID: MB 160-250663/1-A  
Matrix: Water  
Analysis Batch: 254480

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 250663

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03314	U	0.0343	0.0344	1.00	0.0546	pCi/L	05/11/16 18:00	06/02/16 07:51	1
Carrier	MB %Yield	MB Qualifier	Limits		Prepared	Analyzed	Dil Fac			
Ba Carrier	76.4		40 - 110		05/11/16 18:00	06/02/16 07:51	1			

Lab Sample ID: LCS 160-250663/2-A  
Matrix: Water  
Analysis Batch: 254480

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 250663

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	10.79		1.04	1.00	0.0490	pCi/L	97	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	76.1		40 - 110						

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# QC Sample Results

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

TestAmerica Job ID: 280-82792-1

**Lab Sample ID: LCSD 160-250663/3-A**  
**Matrix: Water**  
**Analysis Batch: 254480**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 250663**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.2	12.02		1.17	1.00	0.0941	pCi/L	108	68 - 137	0.56	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	61.8		40 - 110								

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

**Lab Sample ID: MB 160-253318/1-A**  
**Matrix: Water**  
**Analysis Batch: 254481**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 253318**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.01240	U	0.235	0.235	1.00	0.416	pCi/L	05/25/16 18:35	06/02/16 14:30	1
<b>Carrier</b>	<b>%Yield</b>	<b>MB Qualifier</b>	<b>Limits</b>							
Ba Carrier	89.2		40 - 110							
Y Carrier	89.3		40 - 110							
								<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
								05/25/16 18:35	06/02/16 14:30	1
								05/25/16 18:35	06/02/16 14:30	1

**Lab Sample ID: LCS 160-253318/2-A**  
**Matrix: Water**  
**Analysis Batch: 254481**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 253318**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228	15.1	16.80		1.76	1.00	0.370	pCi/L	111	56 - 140		
<b>Carrier</b>	<b>%Yield</b>	<b>LCS Qualifier</b>	<b>Limits</b>								
Ba Carrier	94.0		40 - 110								
Y Carrier	90.5		40 - 110								

**Lab Sample ID: LCSD 160-253318/3-A**  
**Matrix: Water**  
**Analysis Batch: 254481**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 253318**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	15.1	18.73		1.95	1.00	0.403	pCi/L	124	56 - 140	0.52	1
<b>Carrier</b>	<b>%Yield</b>	<b>LCSD Qualifier</b>	<b>Limits</b>								
Ba Carrier	89.7		40 - 110								
Y Carrier	86.0		40 - 110								

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# QC Association Summary

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

TestAmerica Job ID: 280-82792-1

## Metals

### Prep Batch: 229647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total Recoverable	Ground Water	3005A	
280-82792-2	MW-8	Total Recoverable	Ground Water	3005A	
280-82792-3	MW-9	Total Recoverable	Ground Water	3005A	
280-82792-4	MW-10	Total Recoverable	Ground Water	3005A	
280-82792-5	MW-13D	Total Recoverable	Water	3005A	
280-82792-6	MW-10EB	Total Recoverable	Ground Water	3005A	
280-82792-7	MW-13	Total Recoverable	Water	3005A	
LCS 240-229647/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
MB 240-229647/1-A	Method Blank	Total Recoverable	Water	3005A	

### Analysis Batch: 231614

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total Recoverable	Ground Water	6020A	229647
280-82792-1	MW-7	Total Recoverable	Ground Water	6020A	229647
280-82792-2	MW-8	Total Recoverable	Ground Water	6020A	229647
280-82792-2	MW-8	Total Recoverable	Ground Water	6020A	229647
280-82792-3	MW-9	Total Recoverable	Ground Water	6020A	229647
280-82792-3	MW-9	Total Recoverable	Ground Water	6020A	229647
280-82792-4	MW-10	Total Recoverable	Ground Water	6020A	229647
280-82792-4	MW-10	Total Recoverable	Ground Water	6020A	229647
280-82792-5	MW-13D	Total Recoverable	Water	6020A	229647
280-82792-5	MW-13D	Total Recoverable	Water	6020A	229647
280-82792-6	MW-10EB	Total Recoverable	Ground Water	6020A	229647
280-82792-7	MW-13	Total Recoverable	Water	6020A	229647
280-82792-7	MW-13	Total Recoverable	Water	6020A	229647

### Analysis Batch: 232005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 240-229647/2-A	Lab Control Sample	Total Recoverable	Water	6020A	229647
MB 240-229647/1-A	Method Blank	Total Recoverable	Water	6020A	229647

### Prep Batch: 325165

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	7470A	
280-82792-2	MW-8	Total/NA	Ground Water	7470A	
280-82792-3	MW-9	Total/NA	Ground Water	7470A	
280-82792-4	MW-10	Total/NA	Ground Water	7470A	
280-82792-5	MW-13D	Total/NA	Water	7470A	
280-82792-6	MW-10EB	Total/NA	Ground Water	7470A	
280-82792-7	MW-13	Total/NA	Water	7470A	
LCS 280-325165/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 280-325165/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	
MB 280-325165/1-A	Method Blank	Total/NA	Water	7470A	

### Analysis Batch: 325636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	7470A	325165
280-82792-2	MW-8	Total/NA	Ground Water	7470A	325165
280-82792-3	MW-9	Total/NA	Ground Water	7470A	325165
280-82792-4	MW-10	Total/NA	Ground Water	7470A	325165
280-82792-5	MW-13D	Total/NA	Water	7470A	325165

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# QC Association Summary

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

TestAmerica Job ID: 280-82792-1

## Metals (Continued)

### Analysis Batch: 325636 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-6	MW-10EB	Total/NA	Ground Water	7470A	325165
280-82792-7	MW-13	Total/NA	Water	7470A	325165
LCS 280-325165/2-A	Lab Control Sample	Total/NA	Water	7470A	325165
LCSD 280-325165/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	325165
MB 280-325165/1-A	Method Blank	Total/NA	Water	7470A	325165

## General Chemistry

### Analysis Batch: 324141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	9040B	
280-82792-2	MW-8	Total/NA	Ground Water	9040B	
280-82792-3	MW-9	Total/NA	Ground Water	9040B	
280-82792-4	MW-10	Total/NA	Ground Water	9040B	
280-82792-5	MW-13D	Total/NA	Water	9040B	
280-82792-7	MW-13	Total/NA	Water	9040B	
LCS 280-324141/4	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 324466

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	SM 2540C	
280-82792-2	MW-8	Total/NA	Ground Water	SM 2540C	
280-82792-2 DU	MW-8	Total/NA	Ground Water	SM 2540C	
LCS 280-324466/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 280-324466/1	Method Blank	Total/NA	Water	SM 2540C	

### Analysis Batch: 324515

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	SM 2540D	
280-82792-2	MW-8	Total/NA	Ground Water	SM 2540D	
280-82792-3	MW-9	Total/NA	Ground Water	SM 2540D	
280-82792-4	MW-10	Total/NA	Ground Water	SM 2540D	
280-82792-5	MW-13D	Total/NA	Water	SM 2540D	
280-82792-6	MW-10EB	Total/NA	Ground Water	SM 2540D	
280-82792-7	MW-13	Total/NA	Water	SM 2540D	
LCS 280-324515/1	Lab Control Sample	Total/NA	Water	SM 2540D	
LCSD 280-324515/2	Lab Control Sample Dup	Total/NA	Water	SM 2540D	
MB 280-324515/3	Method Blank	Total/NA	Water	SM 2540D	

### Analysis Batch: 324647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-3	MW-9	Total/NA	Ground Water	SM 2540C	
280-82792-4	MW-10	Total/NA	Ground Water	SM 2540C	
280-82792-5	MW-13D	Total/NA	Water	SM 2540C	
280-82792-6	MW-10EB	Total/NA	Ground Water	SM 2540C	
280-82792-7	MW-13	Total/NA	Water	SM 2540C	
280-82792-7 DU	MW-13	Total/NA	Water	SM 2540C	
LCS 280-324647/2	Lab Control Sample	Total/NA	Water	SM 2540C	
MB 280-324647/1	Method Blank	Total/NA	Water	SM 2540C	

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# QC Association Summary

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

TestAmerica Job ID: 280-82792-1

## General Chemistry (Continued)

### Analysis Batch: 324672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-6	MW-10EB	Total/NA	Ground Water	9040B	
LCS 280-324672/4	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 326042

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	9056A	
280-82792-1	MW-7	Total/NA	Ground Water	9056A	
280-82792-2	MW-8	Total/NA	Ground Water	9056A	
280-82792-2	MW-8	Total/NA	Ground Water	9056A	
280-82792-3	MW-9	Total/NA	Ground Water	9056A	
280-82792-3	MW-9	Total/NA	Ground Water	9056A	
280-82792-4	MW-10	Total/NA	Ground Water	9056A	
280-82792-4	MW-10	Total/NA	Ground Water	9056A	
280-82792-5	MW-13D	Total/NA	Water	9056A	
280-82792-5	MW-13D	Total/NA	Water	9056A	
280-82792-6	MW-10EB	Total/NA	Ground Water	9056A	
280-82792-7	MW-13	Total/NA	Water	9056A	
280-82792-7	MW-13	Total/NA	Water	9056A	
LCS 280-326042/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-326042/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MB 280-326042/6	Method Blank	Total/NA	Water	9056A	
MRL 280-326042/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 250663

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	PrecSep-21	
280-82792-2	MW-8	Total/NA	Ground Water	PrecSep-21	
280-82792-3	MW-9	Total/NA	Ground Water	PrecSep-21	
280-82792-4	MW-10	Total/NA	Ground Water	PrecSep-21	
280-82792-5	MW-13D	Total/NA	Water	PrecSep-21	
280-82792-6	MW-10EB	Total/NA	Ground Water	PrecSep-21	
280-82792-7	MW-13	Total/NA	Water	PrecSep-21	
LCS 160-250663/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-250663/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	
MB 160-250663/1-A	Method Blank	Total/NA	Water	PrecSep-21	

### Prep Batch: 253318

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-82792-1	MW-7	Total/NA	Ground Water	PrecSep_0	
280-82792-2	MW-8	Total/NA	Ground Water	PrecSep_0	
280-82792-3	MW-9	Total/NA	Ground Water	PrecSep_0	
280-82792-4	MW-10	Total/NA	Ground Water	PrecSep_0	
280-82792-5	MW-13D	Total/NA	Water	PrecSep_0	
280-82792-6	MW-10EB	Total/NA	Ground Water	PrecSep_0	
280-82792-7	MW-13	Total/NA	Water	PrecSep_0	
LCS 160-253318/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-253318/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep_0	
MB 160-253318/1-A	Method Blank	Total/NA	Water	PrecSep_0	

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# Lab Chronicle

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

TestAmerica Job ID: 280-82792-1

**Client Sample ID: MW-7**  
**Date Collected: 05/04/16 12:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-1**  
**Matrix: Ground 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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	231614	05/23/16 16:26	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 18:52	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:09	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:22	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/19/16 23:29	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	326042	05/19/16 23:46	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	324466	05/09/16 12:28	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			942.96 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	942.96 mL		254480	06/02/16 07:52	RTM	TAL SL
Total/NA	Prep	PrecSep_0			499.21 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	499.21 mL		254481	06/02/16 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

**Client Sample ID: MW-8**  
**Date Collected: 05/04/16 14:00**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-2**  
**Matrix: Ground 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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	231614	05/23/16 16:39	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 18:56	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:11	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:08	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 00:02	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	326042	05/20/16 00:19	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	324466	05/09/16 12:28	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			920.28 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	920.28 mL		254480	06/02/16 07:52	RTM	TAL SL
Total/NA	Prep	PrecSep_0			499.58 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	499.58 mL		254506	06/02/16 14:46	ALS	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-82792-1

**Client Sample ID: MW-9**  
**Date Collected: 05/05/16 10:15**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-3**  
**Matrix: Ground 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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		50	50 mL	50 mL	231614	05/23/16 16:43	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 19:00	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:13	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:26	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 00:36	AFB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	326042	05/20/16 00:53	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	324647	05/10/16 12:00	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			968.52 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	968.52 mL		254480	06/02/16 07:52	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.22 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	500.22 mL		254481	06/02/16 14:32	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

**Client Sample ID: MW-10**  
**Date Collected: 05/05/16 13:30**  
**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-4**  
**Matrix: Ground 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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		20	50 mL	50 mL	231614	05/23/16 16:47	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 19:04	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:16	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:17	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 01:10	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	326042	05/20/16 01:26	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	324647	05/10/16 12:00	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.34 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	1000.34 mL		254480	06/02/16 07:52	RTM	TAL SL
Total/NA	Prep	PrecSep_0			499.27 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	499.27 mL		254481	06/02/16 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-82792-1

**Client Sample ID: MW-13D**

**Date Collected: 05/04/16 10:30**

**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-5**

**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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		10	50 mL	50 mL	231614	05/23/16 16:51	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 19:08	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:23	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:14	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 01:43	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	326042	05/20/16 02:00	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	324647	05/10/16 12:00	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			944.88 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	944.88 mL		254480	06/02/16 07:53	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.00 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	500.00 mL		254481	06/02/16 14:33	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

**Client Sample ID: MW-10EB**

**Date Collected: 05/05/16 13:50**

**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-6**

**Matrix: Ground 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	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 16:56	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:25	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324672	05/07/16 14:44	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 02:50	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	324647	05/10/16 12:00	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			945.16 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	945.16 mL		254480	06/02/16 07:53	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.00 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	500.00 mL		254480	06/02/16 14:28	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	RTM	TAL SL

**Client Sample ID: MW-13**

**Date Collected: 05/04/16 10:30**

**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**

**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	229647	05/10/16 11:51	AJC	TAL CAN

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-82792-1

**Client Sample ID: MW-13**

**Date Collected: 05/04/16 10:30**

**Date Received: 05/05/16 14:55**

**Lab Sample ID: 280-82792-7**

**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		10	50 mL	50 mL	231614	05/23/16 17:00	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	229647	05/10/16 11:51	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1	50 mL	50 mL	231614	05/23/16 19:12	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	325165	05/16/16 11:55	CDH	TAL DEN
Total/NA	Analysis	7470A		1	30 mL	50 mL	325636	05/16/16 20:27	CDH	TAL DEN
Total/NA	Analysis	9040B		1			324141	05/05/16 22:38	MAS	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	326042	05/20/16 03:07	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	326042	05/20/16 03:24	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	324647	05/10/16 12:00	MNG	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	324515	05/09/16 15:39	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			965.87 mL	1.0 g	250663	05/11/16 18:00	MCJ	TAL SL
Total/NA	Analysis	9315		1	965.87 mL		254480	06/02/16 07:53	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.25 mL	1.0 g	253318	05/25/16 18:35	MCJ	TAL SL
Total/NA	Analysis	9320		1	500.25 mL		254480	06/02/16 14:28	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			254845	06/05/16 23:05	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

# Certification Summary

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

TestAmerica Job ID: 280-82792-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP	10	4025	01-09-17
The following analytes are included in this report, but are not certified under this certification:				
Analysis Method	Prep Method	Matrix	Analyte	
9040B		Ground Water	Temperature	
9040B		Water	Temperature	

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-16 *
Illinois	NELAP	5	200004	07-31-16 *
Kansas	NELAP	7	E-10336	07-31-16 *
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16
L-A-B	DoD ELAP		L2315	07-18-16
Minnesota	NELAP	5	039-999-348	12-31-16
Nevada	State Program	9	OH-000482008A	07-31-16 *
New Jersey	NELAP	2	OH001	06-30-16 *
New York	NELAP	2	10975	03-31-17
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-16 *
Texas	NELAP	6	T104704517-15-5	08-31-16 *
USDA	Federal		P330-13-00319	11-26-16
Virginia	NELAP	3	460175	09-14-16
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16
Wisconsin	State Program	5	999518190	08-31-16 *

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-16 *
California	State Program	9	2886	03-31-18
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-16 *
Illinois	NELAP	5	003757	11-30-16
Iowa	State Program	7	373	12-01-16
Kansas	NELAP	7	E-10236	07-31-16 *
Kentucky (DW)	State Program	4	90125	12-31-16
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-16 *
Louisiana (DW)	NELAP	6	LA160008	12-31-16
Maryland	State Program	3	310	09-30-16
Missouri	State Program	7	780	06-30-16 *

\* Certification renewal pending - certification considered valid.



# Certification Summary

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

TestAmerica Job ID: 280-82792-1

## Laboratory: TestAmerica St. Louis (Continued)

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


Authority	Program	EPA Region	Certification ID	Expiration Date
Nevada	State Program	9	MO000542016-1	07-31-16 *
New Jersey	NELAP	2	MO002	06-30-16 *
New York	NELAP	2	11616	03-31-17
North Dakota	State Program	8	R207	06-30-16 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-16 *
Pennsylvania	NELAP	3	68-00540	02-28-17 *
South Carolina	State Program	4	85002001	06-30-16 *
Texas	NELAP	6	T104704193-15-9	07-31-16 *
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542015-7	07-31-16
Virginia	NELAP	3	460230	06-14-16 *
Washington	State Program	10	C592	08-30-16
West Virginia DEP	State Program	3	381	08-31-16

\* Certification renewal pending - certification considered valid.

TestAmerica Denver



### Chain of Custody Record

<b>Client Information</b> Client Contact: Anna Lundin Company: HDR Inc. Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State, Zip: CO, 80112 Phone: 720-633-2380(Tel) Email: anna.lundin@hdrinc.com Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		Lab PIV: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com Phone: 518-331-7017 Job #: _____		Carrier Tracking No(s): _____ COC No: _____ Page: 1 of 1 Job #: _____							
Due Date Requested: _____ TAT Requested (days): Standard		Analysis Requested  280-82792 Chain of Custody									
PO #: DEN-001 WO #: _____ Project #: 28014371 SSOW#: _____		Total Number of Containers: _____									
<b>Sample Identification</b>		<b>Special Instructions/Note:</b>									
Sample 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)	Performance MS/MSD (Yes or No)	M	D	N	D	Total Number of Containers
MW-7	5/4/16	1215	G	Water	N	N	2	1	1	2	7
MW-8	6/4/16	1400	G	Water	N	N	2	1	1	2	7
MW-9	5/5/16	1015	G	Water	N	N	2	1	1	2	7
MW-10	5/5/16	1330	G	Water	N	N	2	1	1	2	7
MW-13	5/4/16	1030	G	Water	N	N	2	1	1	2	7
MW-13D	5/5/16	1350	G	Water	N	N	2	1	1	2	7
MW-10EB	5/4/16	1030	G	Water	M	N	2	1	1	2	7
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological											
Deliverable Requested: I, II, III, IV, Other (specify) _____											
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months											
Special Instructions/QC Requirements: _____											
Empty Kit Relinquished by: _____ Relinquished by: <i>Steph Kupper</i> Relinquished by: <i>Susan Bills</i> Relinquished by: _____		Date: 5/5/16 1455 Date/Time: _____ Date/Time: _____ Date/Time: _____		Method of Shipment: _____ Received by: _____ Received by: _____ Received by: _____		Date/Time: 05/05/16 1455 Date/Time: _____ Date/Time: _____		Company: HDR Company: _____ Company: _____		Cooler Temperature(s) and Other Remarks: <i>Transfer to YMA 9.8, 20.6, 12.1 DP5 - 0.1</i>	



# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler: Kupper, Stephanie K		Carrier Tracking No(s):					
Client Contact: 4955 Yarrow Street, Arvada, CO 80002		Phone: 303-736-0100		COC No: 280-350103.1					
Shipping/Receiving		E-Mail: stephanie.kupper@testamericainc.com		Page: Page 1 of 1					
Company: TestAmerica Laboratories, Inc.		Lab P/N: Kupper, Stephanie K		Job #: 280-82792-1					
Address: 13715 Rider Trail North, Earth City, MO, 63045		Due Date Requested: 6/1/2016		Preservation Codes:					
City: Earth City		TAT Requested (days):		A - HCl B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA Other:					
PO #: 314-298-8566(Tel) 314-298-8757(Fax)		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)					
Email: 314-298-8566(Tel) 314-298-8757(Fax)		SSOW#: 28014371		Total Number of Containers					
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		Site: Xcel Energy CCR - Cherokee Station		Special Instructions/Note:					
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C-Comp, G-grab)	Matrix (W-water, S-solid, O-wastefoil, BT-Tissue, A-Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315 Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320 Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	Analysis Requested
MW-7 (280-82792-1)	5/4/16	12:15 Mountain	Water	Water	X	X	X	X	
MW-8 (280-82792-2)	5/4/16	14:00 Mountain	Water	Water	X	X	X	X	
MW-9 (280-82792-3)	5/5/16	10:15 Mountain	Water	Water	X	X	X	X	
MW-10 (280-82792-4)	5/5/16	13:30 Mountain	Water	Water	X	X	X	X	
MW-13D (280-82792-5)	5/4/16	10:30 Mountain	Water	Water	X	X	X	X	
MW-10EB (280-82792-6)	5/5/16	13:50 Mountain	Water	Water	X	X	X	X	
MW-13 (280-82792-7)	5/4/16	10:30 Mountain	Water	Water	X	X	X	X	
<p><b>Possible Hazard Identification</b>          Unconfirmed          Deliverable Requested: I, II, III, IV, Other (specify)</p> <p><b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p> <p>Special Instructions/QC Requirements:</p>									
Relinquished by: <i>[Signature]</i>		Date/Time: 5/16/16 10:15		Company: Company		Date/Time: 5-17-16 0830		Company: JASR Company	
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:		Method of Shipment:		Empty Kit Relinquished by:	



4.0/03.5  
Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b> Client Contact: Kupper, Stephanie K Shipping/Receiving: stephanie.kupper@testamericainc.com Company: TestAmerica Laboratories, Inc.		Lab PM: Kupper, Stephanie K E-Mail: stephanie.kupper@testamericainc.com		Carrier Tracking No(s): 280-350104-1 Page: Page 1 of 1 Job #: 280-82792-1	
Address: 4101 Shuffel Street NW, City: North Canton State, Zip: OH, 44720 Phone: 330-497-9396(Tel) 330-497-0772(Fax) Email:		Due Date Requested: 5/27/2016 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 Other:	
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		PO #: 28014371 WO #:		Preservation Codes: M - Hexane N - None O - AsHClO2 P - Na2O4S Q - Na2SO3 R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
Sample Identification - Client ID (Lab ID) MW-7 (280-82792-1) MW-8 (280-82792-2) MW-9 (280-82792-3) MW-10 (280-82792-4) MW-13D (280-82792-5) MW-10EB (280-82792-6) MW-13 (280-82792-7)		Sample Date 5/4/16 5/4/16 5/5/16 5/5/16 5/4/16 5/5/16 5/4/16		Sample Time 12:15 Mountain 14:00 Mountain 10:15 Mountain 13:30 Mountain 10:30 Mountain 13:50 Mountain 10:30 Mountain	
Sample Type (C=comp, G=grab) G-Grab G-Grab G-Grab G-Grab G-Grab G-Grab G-Grab		Matrix (Water, Seawater, Other) Water Water Water Water Water Water Water		Field Filtered, Sample (Yes or No) No No No No No No No	
Field Filtered, Sample (Yes or No) No No No No No No No		Field Filtered, Sample (Yes or No) No No No No No No No		Total Number of Containers 1 1 1 1 1 1 1	
Special Instructions/Note: 523 Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell		Special Instructions/Note: Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell		Special Instructions/Note: Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell Use Collision Cell	
Possible Hazard Identification Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify)					
Empty Kit Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature] Relinquished by: [Signature]					
Date: 5/16/16 14:15 Date/Time: 5/16/16 14:15 Date/Time: 5/16/16 14:15 Date/Time: 5/16/16 14:15					
Custody Seal No.: Δ Yes Δ No					



**TestAmerica Canton Sample Receipt Form/Narrative**  
**Canton Facility**

Login # : \_\_\_\_\_

Client Denver Site Name \_\_\_\_\_  
 Cooler Received on 5-7-16 Opened on 5-9-16  
 FedEx: 1<sup>st</sup> Grd EXP UPS FAS Stetson Client Drop Off TestAmerica Courier Other \_\_\_\_\_

Cooler unpacked by: \_\_\_\_\_

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# 48 (CF -1.9 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  
 IR GUN# 36 (CF -1.5 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  
 IR GUN# 18 (CF -0.5 °C) Observed Cooler Temp. 4.0 °C Corrected Cooler Temp. 3.5 °C
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No  
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA  
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
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 sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC559158
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 # \_\_\_\_\_ 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 \_\_\_\_\_

**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: 280-82792-1

**Login Number: 82792**  
**List Number: 1**  
**Creator: Soto, Mayra A**

**List Source: TestAmerica Denver**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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.	False	NOT ENOUGH
Cooler Temperature is acceptable.	False	REFER TO CUR SHEET
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (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: 280-82792-1

**Login Number: 82792**

**List Number: 2**

**Creator: Clarke, Jill C**

**List Source: TestAmerica St. Louis**

**List Creation: 05/09/16 11:55 AM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.4, 0.1
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-82792-1

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
280-82792-1	MW-7	69.2	
280-82792-2	MW-8	67.2	
280-82792-3	MW-9	72.4	
280-82792-4	MW-10	67.8	
280-82792-6	MW-10EB	69.5	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
280-82792-5	MW-13D	78.3	
280-82792-7	MW-13	65.0	
LCS 160-250663/2-A	Lab Control Sample	76.1	
LCSD 160-250663/3-A	Lab Control Sample Dup	61.8	
MB 160-250663/1-A	Method Blank	76.4	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-82792-1	MW-7	97.2	94.2
280-82792-2	MW-8	96.6	95.0
280-82792-3	MW-9	96.0	92.0
280-82792-4	MW-10	99.4	90.1
280-82792-6	MW-10EB	95.4	90.8
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-82792-5	MW-13D	101	89.7
280-82792-7	MW-13	95.2	93.1
LCS 160-253318/2-A	Lab Control Sample	94.0	90.5
LCSD 160-253318/3-A	Lab Control Sample Dup	89.7	86.0

TestAmerica Denver

# Tracer/Carrier Summary

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

TestAmerica Job ID: 280-82792-1

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

**Matrix: Water**

**Prep Type: Total/NA**

## Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
MB 160-253318/1-A	Method Blank	89.2	89.3

### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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



# 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: 280-87226-1

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:  
9/23/2016 12:54:57 PM

Stephanie Rothmeyer, Project Manager I  
(303)736-0182

[stephanie.rothmeyer@testamericainc.com](mailto:stephanie.rothmeyer@testamericainc.com)

### LINKS

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 280-87226-1

## 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.
F1	MS and/or MSD Recovery is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

### General Chemistry

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

### Rad

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

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-87226-1

**Job ID: 280-87226-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-87226-1**

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 8/23/2016 at 3:48 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 2.2° C and 3.1° C.

### **TOTAL RECOVERABLE METALS (ICPMS)**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 08/26/2016 and analyzed on 08/31/2016 and 09/07/2016.

Barium, Calcium, Lead and Boron were detected in method blank MB 240-244446/1-A 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.

Calcium failed the recovery criteria low for the MS of sample MW-10 (280-87226-2) in batch 240-245809. Beryllium and Boron failed the recovery criteria high. Beryllium and Calcium failed the recovery criteria high for the MSD of sample MW-10 (280-87226-2) in batch 240-245809. 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-7 (280-87226-1)[20X], MW-10 (280-87226-2)[50X], MW-13D (280-87226-3)[10X] and MW-13 (280-87226-5)[10X] 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.

### **TOTAL MERCURY**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 09/09/2016.

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

### **TOTAL DISSOLVED SOLIDS**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 08/25/2016.

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: 280-87226-1

## Job ID: 280-87226-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

#### **TOTAL SUSPENDED SOLIDS**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 08/29/2016.

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

#### **CORROSIVITY (PH)**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 08/24/2016.

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

#### **ANIONS (28 DAYS)**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/09/2016 and 09/13/2016.

Chloride was detected in method blank MB 280-341503/13 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.

Sulfate was detected in method blank MB 280-341858/6 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.

Sulfate failed the recovery criteria low for the MS and MSD of sample 280-87664-9 in batch 280-341503. Sulfate failed the recovery criteria high. 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-7 (280-87226-1)[5X], MW-10 (280-87226-2)[10X], MW-10 (280-87226-2)[5X], MW-13D (280-87226-3)[5X] and MW-13 (280-87226-5)[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-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 08/30/2016 and analyzed on 09/21/2016.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4), MW-13 (280-87226-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead to demonstrate batch precision.

The following sample was prepared at a reduced aliquot due to sediment: MW-7 (280-87226-1).

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

#### **RADIUM-228**

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 08/30/2016 and analyzed on 09/14/2016.

Insufficient sample volume was available to perform a sample duplicate (DUP) for the following samples: MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4), MW-13 (280-87226-5). 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: 280-87226-1

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## Job ID: 280-87226-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

The following sample was prepared at a reduced aliquot due to sediment: MW-7 (280-87226-1).

The radium-228 detection goal was not met for the following sample due to the reduced sample volume attributed to the presence of matrix interferences: MW-7 (280-87226-1). Analytical results are reported with the detection limit achieved.

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

### RADIUM-226/RADIUM-228 (GFPC)

Samples MW-7 (280-87226-1), MW-10 (280-87226-2), MW-13D (280-87226-3), MW-13EB (280-87226-4) and MW-13 (280-87226-5) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 09/23/2016.

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: 280-87226-1

**Client Sample ID: MW-7**

**Lab Sample ID: 280-87226-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0011	J	0.0020	0.00027	mg/L	1		6020A	Total Recoverable
Arsenic	0.0056		0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.16	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Beryllium	0.0011		0.0010	0.00040	mg/L	1		6020A	Total Recoverable
Boron	1.6	B	0.40	0.050	mg/L	20		6020A	Total Recoverable
Cadmium	0.00068	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	240	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.036		0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.0075		0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.016	B	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.082		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.011		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0036	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
Thallium	0.00052	J	0.0010	0.00028	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	600	B	15	1.3	mg/L	5		9056A	Total/NA
Fluoride	0.87		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	430		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	3000		500	140	mg/L	1		SM 2540D	Total/NA

**Client Sample ID: MW-10**

**Lab Sample ID: 280-87226-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Antimony	0.0022		0.0020	0.00027	mg/L	1		6020A	Total Recoverable
Arsenic	0.0038	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.066	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Boron	2.5	B	1.0	0.13	mg/L	50		6020A	Total Recoverable
Cadmium	0.00044	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	360	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.018		0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.0013		0.0010	0.00013	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: 280-87226-1

## Client Sample ID: MW-10 (Continued)

## Lab Sample ID: 280-87226-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.00055	J B	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.093		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.048		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0045	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	9.0	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	350	B	15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1000	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	14		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13D

## Lab Sample ID: 280-87226-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00078	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.077	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Boron	0.67	B	0.20	0.025	mg/L	10		6020A	Total Recoverable
Calcium	120	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.0019	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.00036	J	0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.00038	J B	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.032		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0025	J	0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0052		0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190	B	3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	0.99		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	180		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	980		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.2		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13EB

## Lab Sample ID: 280-87226-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.0041	J B	0.020	0.0025	mg/L	1		6020A	Total Recoverable
Calcium	0.096	J B	1.0	0.043	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: 280-87226-1

## Client Sample ID: MW-13EB (Continued)

## Lab Sample ID: 280-87226-4

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	21.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	0.69	J B	3.0	0.25	mg/L	1		9056A	Total/NA
Sulfate	0.41	J	5.0	0.23	mg/L	1		9056A	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-87226-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.00073	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.078	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Boron	0.63	B	0.20	0.025	mg/L	10		6020A	Total Recoverable
Calcium	120	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00099	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.00029	J	0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lithium	0.031		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0023	J	0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0049	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190	B	3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.0		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	180		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	920		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	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: 280-87226-1

Method	Method Description	Protocol	Laboratory
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-87226-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-87226-1	MW-7	Water	08/23/16 15:10	08/23/16 15:48
280-87226-2	MW-10	Water	08/23/16 12:55	08/23/16 15:48
280-87226-3	MW-13D	Water	08/23/16 09:40	08/23/16 15:48
280-87226-4	MW-13EB	Water	08/23/16 10:10	08/23/16 15:48
280-87226-5	MW-13	Water	08/23/16 09:40	08/23/16 15:48

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# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0011	J	0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 19:15	1
Arsenic	0.0056		0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 19:15	1
Barium	0.16	B	0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 19:15	1
Beryllium	0.0011		0.0010	0.00040	mg/L		08/26/16 12:00	09/07/16 16:49	1
Boron	1.6	B	0.40	0.050	mg/L		08/26/16 12:00	09/07/16 11:38	20
Cadmium	0.00068	J	0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 19:15	1
Calcium	240	B	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 19:15	1
Chromium	0.036		0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 19:15	1
Cobalt	0.0075		0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 19:15	1
Lead	0.016	B	0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 19:15	1
Lithium	0.082		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 19:15	1
Molybdenum	0.011		0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 19:15	1
Selenium	0.0036	J	0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 19:15	1
Thallium	0.00052	J	0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 19:15	1

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0022		0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 18:46	1
Arsenic	0.0038	J	0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 18:46	1
Barium	0.066	B	0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 18:46	1
Beryllium	ND	F1	0.0010	0.00040	mg/L		08/26/16 12:00	08/31/16 18:46	1
Boron	2.5	B	1.0	0.13	mg/L		08/26/16 12:00	09/07/16 11:18	50
Cadmium	0.00044	J	0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 18:46	1
Calcium	360	B	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 18:46	1
Chromium	0.018		0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 18:46	1
Cobalt	0.0013		0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 18:46	1
Lead	0.00055	J B	0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 18:46	1
Lithium	0.093		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 18:46	1
Molybdenum	0.048		0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 18:46	1
Selenium	0.0045	J	0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 18:46	1
Thallium	ND		0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 18:46	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 19:19	1
Arsenic	0.00078	J	0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 19:19	1
Barium	0.077	B	0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 19:19	1
Beryllium	ND		0.0010	0.00040	mg/L		08/26/16 12:00	08/31/16 19:19	1
Boron	0.67	B	0.20	0.025	mg/L		08/26/16 12:00	09/07/16 11:42	10
Cadmium	ND		0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 19:19	1
Calcium	120	B	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 19:19	1
Chromium	0.0019	J	0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 19:19	1
Cobalt	0.00036	J	0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 19:19	1
Lead	0.00038	J B	0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 19:19	1
Lithium	0.032		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 19:19	1
Molybdenum	0.0025	J	0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 19:19	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Selenium	0.0052		0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 19:19	1
Thallium	ND		0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 19:19	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 19:23	1
Arsenic	ND		0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 19:23	1
Barium	ND		0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 19:23	1
Beryllium	ND		0.0010	0.00040	mg/L		08/26/16 12:00	08/31/16 19:23	1
Boron	0.0041	J B	0.020	0.0025	mg/L		08/26/16 12:00	09/07/16 13:01	1
Cadmium	ND		0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 19:23	1
Calcium	0.096	J B	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 19:23	1
Chromium	ND		0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 19:23	1
Cobalt	ND		0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 19:23	1
Lead	ND		0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 19:23	1
Lithium	ND		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 19:23	1
Molybdenum	ND		0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 19:23	1
Selenium	ND		0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 19:23	1
Thallium	ND		0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 19:23	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 19:27	1
Arsenic	0.00073	J	0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 19:27	1
Barium	0.078	B	0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 19:27	1
Beryllium	ND		0.0010	0.00040	mg/L		08/26/16 12:00	08/31/16 19:27	1
Boron	0.63	B	0.20	0.025	mg/L		08/26/16 12:00	09/07/16 13:06	10
Cadmium	ND		0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 19:27	1
Calcium	120	B	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 19:27	1
Chromium	0.00099	J	0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 19:27	1
Cobalt	0.00029	J	0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 19:27	1
Lead	ND		0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 19:27	1
Lithium	0.031		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 19:27	1
Molybdenum	0.0023	J	0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 19:27	1
Selenium	0.0049	J	0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 19:27	1
Thallium	ND		0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 19:27	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 17:56	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 18:02	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 18:05	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 18:07	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 18:09	1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**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			08/24/16 10:57	1
Temperature	21.1	HF	1.0	1.0	Degrees C			08/24/16 10:57	1
Chloride	600	B	15	1.3	mg/L			09/09/16 20:46	5
Fluoride	0.87		0.50	0.060	mg/L			09/09/16 20:26	1
Sulfate	430		25	1.2	mg/L			09/09/16 20:46	5
Total Dissolved Solids (TDS)	2000		20	9.4	mg/L			08/25/16 08:24	1
Total Suspended Solids	3000		500	140	mg/L			08/29/16 16:11	1

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	9.0	HF	0.1	0.1	SU			08/24/16 11:01	1
Temperature	20.9	HF	1.0	1.0	Degrees C			08/24/16 11:01	1
Chloride	350	B	15	1.3	mg/L			09/09/16 21:26	5
Fluoride	1.2		0.50	0.060	mg/L			09/09/16 21:06	1
Sulfate	1000	B	50	2.3	mg/L			09/13/16 11:13	10
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L			08/25/16 08:24	1
Total Suspended Solids	14		4.0	1.1	mg/L			08/29/16 16:11	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**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			08/24/16 11:13	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

## General Chemistry (Continued)

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	21.1	HF	1.0	1.0	Degrees C			08/24/16 11:13	1
Chloride	190	B	3.0	0.25	mg/L			09/09/16 21:46	1
Fluoride	0.99		0.50	0.060	mg/L			09/09/16 21:46	1
Sulfate	180		25	1.2	mg/L			09/09/16 22:46	5
Total Dissolved Solids (TDS)	980		10	4.7	mg/L			08/25/16 08:24	1
Total Suspended Solids	5.2		4.0	1.1	mg/L			08/29/16 16:11	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**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			08/24/16 11:22	1
Temperature	21.4	HF	1.0	1.0	Degrees C			08/24/16 11:22	1
Chloride	0.69	J B	3.0	0.25	mg/L			09/09/16 23:05	1
Fluoride	ND		0.50	0.060	mg/L			09/09/16 23:05	1
Sulfate	0.41	J	5.0	0.23	mg/L			09/09/16 23:05	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			08/25/16 08:24	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			08/29/16 16:11	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**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			08/24/16 11:27	1
Temperature	21.3	HF	1.0	1.0	Degrees C			08/24/16 11:27	1
Chloride	190	B	3.0	0.25	mg/L			09/09/16 23:25	1
Fluoride	1.0		0.50	0.060	mg/L			09/09/16 23:25	1
Sulfate	180		25	1.2	mg/L			09/09/16 23:45	5
Total Dissolved Solids (TDS)	920		10	4.7	mg/L			08/25/16 08:24	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			08/29/16 16:11	1

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

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.15		0.285	0.303	1.00	0.277	pCi/L	08/30/16 18:26	09/21/16 20:01	1
<i>Carrier</i>	<i>%Yield</i>	<i>Qualifier</i>	<i>Limits</i>					<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>Ba Carrier</i>	52.4		40 - 110					08/30/16 18:26	09/21/16 20:01	1

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.124		0.0625	0.0635	1.00	0.0798	pCi/L	08/30/16 18:26	09/21/16 20:01	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

Carrier	%Yield	Qualifier	Limits
Ba Carrier	85.2		40 - 110

Prepared	Analyzed	Dil Fac
08/30/16 18:26	09/21/16 20:01	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.335		0.0896	0.0945	1.00	0.0859	pCi/L	08/30/16 18:26	09/21/16 20:01	1

Carrier	%Yield	Qualifier	Limits
Ba Carrier	87.7		40 - 110

Prepared	Analyzed	Dil Fac
08/30/16 18:26	09/21/16 20:01	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0711	U	0.0547	0.0551	1.00	0.0811	pCi/L	08/30/16 18:26	09/21/16 20:01	1

Carrier	%Yield	Qualifier	Limits
Ba Carrier	86.3		40 - 110

Prepared	Analyzed	Dil Fac
08/30/16 18:26	09/21/16 20:01	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.324		0.0886	0.0933	1.00	0.0789	pCi/L	08/30/16 18:26	09/21/16 20:00	1

Carrier	%Yield	Qualifier	Limits
Ba Carrier	81.8		40 - 110

Prepared	Analyzed	Dil Fac
08/30/16 18:26	09/21/16 20:00	1

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

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	2.71	G	1.11	1.14	1.00	1.58	pCi/L	08/30/16 18:50	09/14/16 16:36	1

Carrier	%Yield	Qualifier	Limits
Ba Carrier	52.4		40 - 110
Y Carrier	79.3		40 - 110

Prepared	Analyzed	Dil Fac
08/30/16 18:50	09/14/16 16:36	1
08/30/16 18:50	09/14/16 16:36	1

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.623		0.288	0.293	1.00	0.413	pCi/L	08/30/16 18:50	09/14/16 16:36	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

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

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.2		40 - 110	08/30/16 18:50	09/14/16 16:36	1
Y Carrier	83.7		40 - 110	08/30/16 18:50	09/14/16 16:36	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.350	U	0.253	0.255	1.00	0.394	pCi/L	08/30/16 18:50	09/14/16 16:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	87.7		40 - 110	08/30/16 18:50	09/14/16 16:37	1
Y Carrier	82.6		40 - 110	08/30/16 18:50	09/14/16 16:37	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.107	U	0.212	0.212	1.00	0.403	pCi/L	08/30/16 18:50	09/14/16 16:37	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		40 - 110	08/30/16 18:50	09/14/16 16:37	1
Y Carrier	84.5		40 - 110	08/30/16 18:50	09/14/16 16:37	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.257	U	0.245	0.246	1.00	0.395	pCi/L	08/30/16 18:50	09/14/16 16:38	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	81.8		40 - 110	08/30/16 18:50	09/14/16 16:38	1
Y Carrier	84.9		40 - 110	08/30/16 18:50	09/14/16 16:38	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.87		1.15	1.18	5.00	1.58	pCi/L		09/23/16 06:04	1

# Client Sample Results

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

TestAmerica Job ID: 280-87226-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.747		0.294	0.300	5.00	0.413	pCi/L		09/23/16 06:04	1

**Client Sample ID: MW-13D**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.685		0.269	0.272	5.00	0.394	pCi/L		09/23/16 06:04	1

**Client Sample ID: MW-13EB**  
**Date Collected: 08/23/16 10:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0363	U	0.219	0.219	5.00	0.403	pCi/L		09/23/16 06:04	1

**Client Sample ID: MW-13**  
**Date Collected: 08/23/16 09:40**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.581		0.261	0.263	5.00	0.395	pCi/L		09/23/16 06:04	1

# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Lab Sample ID: MB 240-244446/1-A**  
**Matrix: Water**  
**Analysis Batch: 245137**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		08/26/16 12:00	08/31/16 18:38	1
Arsenic	ND		0.0050	0.00035	mg/L		08/26/16 12:00	08/31/16 18:38	1
Barium	0.00104	J	0.0050	0.00052	mg/L		08/26/16 12:00	08/31/16 18:38	1
Cadmium	ND		0.0010	0.00031	mg/L		08/26/16 12:00	08/31/16 18:38	1
Calcium	0.251	J	1.0	0.043	mg/L		08/26/16 12:00	08/31/16 18:38	1
Chromium	ND		0.0020	0.00026	mg/L		08/26/16 12:00	08/31/16 18:38	1
Cobalt	ND		0.0010	0.00013	mg/L		08/26/16 12:00	08/31/16 18:38	1
Lead	0.000194	J	0.0010	0.00016	mg/L		08/26/16 12:00	08/31/16 18:38	1
Lithium	ND		0.0080	0.00016	mg/L		08/26/16 12:00	08/31/16 18:38	1
Molybdenum	ND		0.010	0.00051	mg/L		08/26/16 12:00	08/31/16 18:38	1
Selenium	ND		0.0050	0.00048	mg/L		08/26/16 12:00	08/31/16 18:38	1
Thallium	ND		0.0010	0.00028	mg/L		08/26/16 12:00	08/31/16 18:38	1

**Lab Sample ID: MB 240-244446/1-A**  
**Matrix: Water**  
**Analysis Batch: 245809**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010	0.00040	mg/L		08/26/16 12:00	09/07/16 11:10	1
Boron	0.00834	J	0.020	0.0025	mg/L		08/26/16 12:00	09/07/16 11:10	1

**Lab Sample ID: LCS 240-244446/2-A**  
**Matrix: Water**  
**Analysis Batch: 245137**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.100	0.102		mg/L		102	80 - 120
Arsenic	1.00	0.999		mg/L		100	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Cadmium	1.00	1.04		mg/L		104	80 - 120
Calcium	10.0	10.4		mg/L		104	80 - 120
Chromium	1.00	1.02		mg/L		102	80 - 120
Cobalt	1.00	1.06		mg/L		106	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Lithium	0.100	0.0883		mg/L		88	80 - 120
Molybdenum	0.100	0.0978		mg/L		98	80 - 120
Selenium	1.00	1.01		mg/L		101	80 - 120
Thallium	0.250	0.251		mg/L		100	80 - 120

**Lab Sample ID: LCS 240-244446/2-A**  
**Matrix: Water**  
**Analysis Batch: 245809**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Beryllium	1.00	1.01		mg/L		101	80 - 120
Boron	0.100	0.102		mg/L		102	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Lab Sample ID: 280-87226-2 MS**  
**Matrix: Water**  
**Analysis Batch: 245137**

**Client Sample ID: MW-10**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	Limits
	Result	Qualifier		Result	Qualifier				
Antimony	0.0022		0.100	0.104		mg/L		102	75 - 125
Arsenic	0.0038	J	1.00	1.02		mg/L		101	75 - 125
Barium	0.066	B	1.00	1.10	B	mg/L		104	75 - 125
Beryllium	ND	F1	1.00	1.31	F1	mg/L		131	75 - 125
Cadmium	0.00044	J	1.00	0.963		mg/L		96	75 - 125
Calcium	360	B	10.0	365	4 B	mg/L		55	75 - 125
Chromium	0.018		1.00	0.989		mg/L		97	75 - 125
Cobalt	0.0013		1.00	0.993		mg/L		99	75 - 125
Lead	0.00055	J B	1.00	0.931		mg/L		93	75 - 125
Lithium	0.093		0.100	0.183		mg/L		90	75 - 125
Molybdenum	0.048		0.100	0.151		mg/L		103	75 - 125
Selenium	0.0045	J	1.00	1.01		mg/L		100	75 - 125
Thallium	ND		0.250	0.234		mg/L		93	75 - 125

**Lab Sample ID: 280-87226-2 MS**  
**Matrix: Water**  
**Analysis Batch: 245809**

**Client Sample ID: MW-10**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Sample	Sample	Spike	MS		Unit	D	%Rec	Limits
	Result	Qualifier		Result	Qualifier				
Boron	2.5	B	0.100	2.65	4	mg/L		199	75 - 125

**Lab Sample ID: 280-87226-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 245137**

**Client Sample ID: MW-10**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Antimony	0.0022		0.100	0.104		mg/L		102	75 - 125	1	20
Arsenic	0.0038	J	1.00	1.03		mg/L		102	75 - 125	1	20
Barium	0.066	B	1.00	1.11	B	mg/L		104	75 - 125	1	20
Beryllium	ND	F1	1.00	1.26	F1	mg/L		126	75 - 125	3	20
Cadmium	0.00044	J	1.00	0.967		mg/L		97	75 - 125	0	20
Calcium	360	B	10.0	372	4 B	mg/L		130	75 - 125	2	20
Chromium	0.018		1.00	0.989		mg/L		97	75 - 125	0	20
Cobalt	0.0013		1.00	0.980		mg/L		98	75 - 125	1	20
Lead	0.00055	J B	1.00	0.947		mg/L		95	75 - 125	2	20
Lithium	0.093		0.100	0.184		mg/L		91	75 - 125	1	20
Molybdenum	0.048		0.100	0.153		mg/L		105	75 - 125	1	20
Selenium	0.0045	J	1.00	1.02		mg/L		101	75 - 125	1	20
Thallium	ND		0.250	0.234		mg/L		94	75 - 125	0	20

**Lab Sample ID: 280-87226-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 245809**

**Client Sample ID: MW-10**  
**Prep Type: Total Recoverable**  
**Prep Batch: 244446**

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	Limits	RPD	Limit
	Result	Qualifier		Result	Qualifier						
Boron	2.5	B	0.100	2.56	4	mg/L		106	75 - 125	4	20

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-341477/1-A**  
**Matrix: Water**  
**Analysis Batch: 341644**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 341477**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		09/09/16 12:00	09/09/16 17:22	1

**Lab Sample ID: LCS 280-341477/2-A**  
**Matrix: Water**  
**Analysis Batch: 341644**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 341477**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.00		ug/L		100	84 - 120

**Lab Sample ID: LCSD 280-341477/3-A**  
**Matrix: Water**  
**Analysis Batch: 341644**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 341477**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	5.00	5.24		ug/L		105	84 - 120	5	15

## Method: 9040B - pH

**Lab Sample ID: LCS 280-339324/28**  
**Matrix: Water**  
**Analysis Batch: 339324**

**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 280-339324/51**  
**Matrix: Water**  
**Analysis Batch: 339324**

**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: 280-87226-3 DU**  
**Matrix: Water**  
**Analysis Batch: 339324**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
pH adj. to 25 deg C	7.5	HF	7.6		SU		1	5
Temperature	21.1	HF	21.4		Degrees C		1	10

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-341503/13**  
**Matrix: Water**  
**Analysis Batch: 341503**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	0.665	J	3.0	0.25	mg/L			09/09/16 14:48	1
Fluoride	ND		0.50	0.060	mg/L			09/09/16 14:48	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Lab Sample ID: MB 280-341503/13**  
**Matrix: Water**  
**Analysis Batch: 341503**

**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			09/09/16 14:48	1

**Lab Sample ID: LCS 280-341503/11**  
**Matrix: Water**  
**Analysis Batch: 341503**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	96.1		mg/L		96	90 - 110
Fluoride	5.00	4.92		mg/L		98	90 - 110
Sulfate	100	95.9		mg/L		96	90 - 110

**Lab Sample ID: LCSD 280-341503/12**  
**Matrix: Water**  
**Analysis Batch: 341503**

**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	96.2		mg/L		96	90 - 110	0	10
Fluoride	5.00	4.94		mg/L		99	90 - 110	0	10
Sulfate	100	95.9		mg/L		96	90 - 110	0	10

**Lab Sample ID: MRL 280-341503/10**  
**Matrix: Water**  
**Analysis Batch: 341503**

**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	2.37	J	mg/L		95	50 - 150
Fluoride	0.200	0.194	J	mg/L		97	50 - 150
Sulfate	2.50	2.42	J	mg/L		97	50 - 150

**Lab Sample ID: MB 280-341858/6**  
**Matrix: Water**  
**Analysis Batch: 341858**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	0.520	J	5.0	0.23	mg/L			09/13/16 10:57	1

**Lab Sample ID: LCS 280-341858/4**  
**Matrix: Water**  
**Analysis Batch: 341858**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	100	99.4		mg/L		99	90 - 110

**Lab Sample ID: LCSD 280-341858/5**  
**Matrix: Water**  
**Analysis Batch: 341858**

**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
Sulfate	100	99.3		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: 280-87226-1

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

**Lab Sample ID: MRL 280-341858/3**  
**Matrix: Water**  
**Analysis Batch: 341858**

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	2.50	2.28	J	mg/L		91	50 - 150

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

**Lab Sample ID: MB 280-339511/1**  
**Matrix: Water**  
**Analysis Batch: 339511**

**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			08/25/16 08:24	1

**Lab Sample ID: LCS 280-339511/2**  
**Matrix: Water**  
**Analysis Batch: 339511**

**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	479		mg/L		96	86 - 110

**Lab Sample ID: LCSD 280-339511/3**  
**Matrix: Water**  
**Analysis Batch: 339511**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	501	490		mg/L		98	86 - 110	2	20

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

**Lab Sample ID: MB 280-339999/2**  
**Matrix: Water**  
**Analysis Batch: 339999**

**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			08/29/16 16:11	1

**Lab Sample ID: LCS 280-339999/1**  
**Matrix: Water**  
**Analysis Batch: 339999**

**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	92.0		mg/L		92	86 - 114

# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Lab Sample ID: MB 160-267408/1-A**  
**Matrix: Water**  
**Analysis Batch: 270875**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 267408**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.03607	U	0.0527	0.0528	1.00	0.0896	pCi/L	08/30/16 18:26	09/21/16 16:04	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		40 - 110					08/30/16 18:26	09/21/16 16:04	1

**Lab Sample ID: LCS 160-267408/2-A**  
**Matrix: Water**  
**Analysis Batch: 271155**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 267408**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.2	13.64		1.33	1.00	0.0752	pCi/L	122	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	84.6		40 - 110						

**Lab Sample ID: LCSD 160-267408/3-A**  
**Matrix: Water**  
**Analysis Batch: 270875**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 267408**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-226	11.2	14.57		1.42	1.00	0.0823	pCi/L	131	68 - 137	0.34	1
Carrier	LCSD %Yield	LCSD Qualifier	Limits								
Ba Carrier	75.5		40 - 110								

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

**Lab Sample ID: MB 160-267411/1-A**  
**Matrix: Water**  
**Analysis Batch: 269644**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 267411**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1552	U	0.267	0.268	1.00	0.452	pCi/L	08/30/16 18:50	09/14/16 16:36	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.5		40 - 110					08/30/16 18:50	09/14/16 16:36	1
Y Carrier	81.9		40 - 110					08/30/16 18:50	09/14/16 16:36	1

TestAmerica Denver



# QC Sample Results

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

TestAmerica Job ID: 280-87226-1

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

**Lab Sample ID: LCS 160-267411/2-A**  
**Matrix: Water**  
**Analysis Batch: 269644**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 267411**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	14.6	17.28		1.85	1.00	0.405	pCi/L	119	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	84.6		40 - 110
Y Carrier	83.4		40 - 110

**Lab Sample ID: LCSD 160-267411/3-A**  
**Matrix: Water**  
**Analysis Batch: 269644**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 267411**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	14.6	17.37		1.90	1.00	0.446	pCi/L	119	56 - 140	0.02	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	75.5		40 - 110
Y Carrier	80.7		40 - 110

# QC Association Summary

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

TestAmerica Job ID: 280-87226-1

## Metals

### Prep Batch: 244446

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total Recoverable	Water	3005A	
280-87226-2	MW-10	Total Recoverable	Water	3005A	
280-87226-3	MW-13D	Total Recoverable	Water	3005A	
280-87226-4	MW-13EB	Total Recoverable	Water	3005A	
280-87226-5	MW-13	Total Recoverable	Water	3005A	
MB 240-244446/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-244446/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-87226-2 MS	MW-10	Total Recoverable	Water	3005A	
280-87226-2 MSD	MW-10	Total Recoverable	Water	3005A	

### Analysis Batch: 245137

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total Recoverable	Water	6020A	244446
280-87226-2	MW-10	Total Recoverable	Water	6020A	244446
280-87226-3	MW-13D	Total Recoverable	Water	6020A	244446
280-87226-4	MW-13EB	Total Recoverable	Water	6020A	244446
280-87226-5	MW-13	Total Recoverable	Water	6020A	244446
MB 240-244446/1-A	Method Blank	Total Recoverable	Water	6020A	244446
LCS 240-244446/2-A	Lab Control Sample	Total Recoverable	Water	6020A	244446
280-87226-2 MS	MW-10	Total Recoverable	Water	6020A	244446
280-87226-2 MSD	MW-10	Total Recoverable	Water	6020A	244446

### Analysis Batch: 245809

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total Recoverable	Water	6020A	244446
280-87226-2	MW-10	Total Recoverable	Water	6020A	244446
280-87226-3	MW-13D	Total Recoverable	Water	6020A	244446
MB 240-244446/1-A	Method Blank	Total Recoverable	Water	6020A	244446
LCS 240-244446/2-A	Lab Control Sample	Total Recoverable	Water	6020A	244446
280-87226-2 MS	MW-10	Total Recoverable	Water	6020A	244446
280-87226-2 MSD	MW-10	Total Recoverable	Water	6020A	244446

### Analysis Batch: 245905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total Recoverable	Water	6020A	244446
280-87226-4	MW-13EB	Total Recoverable	Water	6020A	244446
280-87226-5	MW-13	Total Recoverable	Water	6020A	244446

### Prep Batch: 341477

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	7470A	
280-87226-2	MW-10	Total/NA	Water	7470A	
280-87226-3	MW-13D	Total/NA	Water	7470A	
280-87226-4	MW-13EB	Total/NA	Water	7470A	
280-87226-5	MW-13	Total/NA	Water	7470A	
MB 280-341477/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-341477/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 280-341477/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

# QC Association Summary

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

TestAmerica Job ID: 280-87226-1

## Metals (Continued)

### Analysis Batch: 341644

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	7470A	341477
280-87226-2	MW-10	Total/NA	Water	7470A	341477
280-87226-3	MW-13D	Total/NA	Water	7470A	341477
280-87226-4	MW-13EB	Total/NA	Water	7470A	341477
280-87226-5	MW-13	Total/NA	Water	7470A	341477
MB 280-341477/1-A	Method Blank	Total/NA	Water	7470A	341477
LCS 280-341477/2-A	Lab Control Sample	Total/NA	Water	7470A	341477
LCSD 280-341477/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	341477

## General Chemistry

### Analysis Batch: 339324

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	9040B	
280-87226-2	MW-10	Total/NA	Water	9040B	
280-87226-3	MW-13D	Total/NA	Water	9040B	
280-87226-4	MW-13EB	Total/NA	Water	9040B	
280-87226-5	MW-13	Total/NA	Water	9040B	
LCS 280-339324/28	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-339324/51	Lab Control Sample	Total/NA	Water	9040B	
280-87226-3 DU	MW-13D	Total/NA	Water	9040B	

### Analysis Batch: 339511

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	SM 2540C	
280-87226-2	MW-10	Total/NA	Water	SM 2540C	
280-87226-3	MW-13D	Total/NA	Water	SM 2540C	
280-87226-4	MW-13EB	Total/NA	Water	SM 2540C	
280-87226-5	MW-13	Total/NA	Water	SM 2540C	
MB 280-339511/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-339511/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-339511/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

### Analysis Batch: 339999

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	SM 2540D	
280-87226-2	MW-10	Total/NA	Water	SM 2540D	
280-87226-3	MW-13D	Total/NA	Water	SM 2540D	
280-87226-4	MW-13EB	Total/NA	Water	SM 2540D	
280-87226-5	MW-13	Total/NA	Water	SM 2540D	
MB 280-339999/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-339999/1	Lab Control Sample	Total/NA	Water	SM 2540D	

### Analysis Batch: 341503

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	9056A	
280-87226-1	MW-7	Total/NA	Water	9056A	
280-87226-2	MW-10	Total/NA	Water	9056A	
280-87226-2	MW-10	Total/NA	Water	9056A	
280-87226-3	MW-13D	Total/NA	Water	9056A	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-87226-1

## General Chemistry (Continued)

### Analysis Batch: 341503 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-3	MW-13D	Total/NA	Water	9056A	
280-87226-4	MW-13EB	Total/NA	Water	9056A	
280-87226-5	MW-13	Total/NA	Water	9056A	
280-87226-5	MW-13	Total/NA	Water	9056A	
MB 280-341503/13	Method Blank	Total/NA	Water	9056A	
LCS 280-341503/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-341503/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-341503/10	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 341858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-2	MW-10	Total/NA	Water	9056A	
MB 280-341858/6	Method Blank	Total/NA	Water	9056A	
LCS 280-341858/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-341858/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-341858/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 267408

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	PrecSep-21	
280-87226-2	MW-10	Total/NA	Water	PrecSep-21	
280-87226-3	MW-13D	Total/NA	Water	PrecSep-21	
280-87226-4	MW-13EB	Total/NA	Water	PrecSep-21	
280-87226-5	MW-13	Total/NA	Water	PrecSep-21	
MB 160-267408/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-267408/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-267408/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 267411

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-87226-1	MW-7	Total/NA	Water	PrecSep_0	
280-87226-2	MW-10	Total/NA	Water	PrecSep_0	
280-87226-3	MW-13D	Total/NA	Water	PrecSep_0	
280-87226-4	MW-13EB	Total/NA	Water	PrecSep_0	
280-87226-5	MW-13	Total/NA	Water	PrecSep_0	
MB 160-267411/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-267411/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-267411/3-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: 280-87226-1

**Client Sample ID: MW-7**  
**Date Collected: 08/23/16 15:10**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-1**  
**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	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245137	08/31/16 19:15	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		20			245809	09/07/16 11:38	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245905	09/07/16 16:49	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	341477	09/09/16 12:00	CDH	TAL DEN
Total/NA	Analysis	7470A		1			341644	09/09/16 17:56	CDH	TAL DEN
Total/NA	Analysis	9040B		1			339324	08/24/16 10:57	IEU	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	341503	09/09/16 20:26	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	341503	09/09/16 20:46	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	339511	08/25/16 08:24	KMS	TAL DEN
Total/NA	Analysis	SM 2540D		1	2 mL	250 mL	339999	08/29/16 16:11	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			500.47 mL	1.0 g	267408	08/30/16 18:26	MCJ	TAL SL
Total/NA	Analysis	9315		1			270875	09/21/16 20:01	RTM	TAL SL
Total/NA	Prep	PrecSep_0			500.47 mL	1.0 g	267411	08/30/16 18:50	MCJ	TAL SL
Total/NA	Analysis	9320		1			269644	09/14/16 16:36	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			271225	09/23/16 06:04	ALS	TAL SL

**Client Sample ID: MW-10**  
**Date Collected: 08/23/16 12:55**  
**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-2**  
**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	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245137	08/31/16 18:46	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		50			245809	09/07/16 11:18	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	341477	09/09/16 12:00	CDH	TAL DEN
Total/NA	Analysis	7470A		1			341644	09/09/16 18:02	CDH	TAL DEN
Total/NA	Analysis	9040B		1			339324	08/24/16 11:01	IEU	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	341858	09/13/16 11:13	AFB	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	341503	09/09/16 21:06	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	341503	09/09/16 21:26	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	339511	08/25/16 08:24	KMS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	339999	08/29/16 16:11	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.11 mL	1.0 g	267408	08/30/16 18:26	MCJ	TAL SL
Total/NA	Analysis	9315		1			270875	09/21/16 20:01	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.11 mL	1.0 g	267411	08/30/16 18:50	MCJ	TAL SL
Total/NA	Analysis	9320		1			269644	09/14/16 16:36	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			271225	09/23/16 06:04	ALS	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-87226-1

**Client Sample ID: MW-13D**

**Lab Sample ID: 280-87226-3**

**Date Collected: 08/23/16 09:40**

**Matrix: Water**

**Date Received: 08/23/16 15:48**

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	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245137	08/31/16 19:19	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		10			245809	09/07/16 11:42	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	341477	09/09/16 12:00	CDH	TAL DEN
Total/NA	Analysis	7470A		1			341644	09/09/16 18:05	CDH	TAL DEN
Total/NA	Analysis	9040B		1			339324	08/24/16 11:13	IEU	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	341503	09/09/16 21:46	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	341503	09/09/16 22:46	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	339511	08/25/16 08:24	KMS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	339999	08/29/16 16:11	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.26 mL	1.0 g	267408	08/30/16 18:26	MCJ	TAL SL
Total/NA	Analysis	9315		1			270875	09/21/16 20:01	RTM	TAL SL
Total/NA	Prep	PrecSep_0			999.26 mL	1.0 g	267411	08/30/16 18:50	MCJ	TAL SL
Total/NA	Analysis	9320		1			269644	09/14/16 16:37	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			271225	09/23/16 06:04	ALS	TAL SL

**Client Sample ID: MW-13EB**

**Lab Sample ID: 280-87226-4**

**Date Collected: 08/23/16 10:10**

**Matrix: Water**

**Date Received: 08/23/16 15:48**

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	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245137	08/31/16 19:23	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245905	09/07/16 13:01	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	341477	09/09/16 12:00	CDH	TAL DEN
Total/NA	Analysis	7470A		1			341644	09/09/16 18:07	CDH	TAL DEN
Total/NA	Analysis	9040B		1			339324	08/24/16 11:22	IEU	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	341503	09/09/16 23:05	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	339511	08/25/16 08:24	KMS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	339999	08/29/16 16:11	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.67 mL	1.0 g	267408	08/30/16 18:26	MCJ	TAL SL
Total/NA	Analysis	9315		1			270875	09/21/16 20:01	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.67 mL	1.0 g	267411	08/30/16 18:50	MCJ	TAL SL
Total/NA	Analysis	9320		1			269644	09/14/16 16:37	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			271225	09/23/16 06:04	ALS	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-87226-1

**Client Sample ID: MW-13**

**Date Collected: 08/23/16 09:40**

**Date Received: 08/23/16 15:48**

**Lab Sample ID: 280-87226-5**

**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	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			245137	08/31/16 19:27	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	244446	08/26/16 12:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		10			245905	09/07/16 13:06	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	341477	09/09/16 12:00	CDH	TAL DEN
Total/NA	Analysis	7470A		1			341644	09/09/16 18:09	CDH	TAL DEN
Total/NA	Analysis	9040B		1			339324	08/24/16 11:27	IEU	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	341503	09/09/16 23:25	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	341503	09/09/16 23:45	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	339511	08/25/16 08:24	KMS	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	339999	08/29/16 16:11	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.70 mL	1.0 g	267408	08/30/16 18:26	MCJ	TAL SL
Total/NA	Analysis	9315		1			270871	09/21/16 20:00	RTM	TAL SL
Total/NA	Prep	PrecSep_0			1000.70 mL	1.0 g	267411	08/30/16 18:50	MCJ	TAL SL
Total/NA	Analysis	9320		1			269645	09/14/16 16:38	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			271225	09/23/16 06:04	ALS	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

# Certification Summary

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

TestAmerica Job ID: 280-87226-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP	10	4025	01-09-17

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17
Illinois	NELAP	5	200004	07-31-17
Kansas	NELAP	7	E-10336	01-31-17
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16 *
Minnesota	NELAP	5	039-999-348	12-31-16 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17
Nevada	State Program	9	OH-000482008A	07-31-17
New Jersey	NELAP	2	OH001	06-30-17
New York	NELAP	2	10975	03-31-17
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-17
Texas	NELAP	6	T104704517-15-5	08-31-17
USDA	Federal		P330-13-00319	11-26-16 *
Virginia	NELAP	3	460175	09-14-16 *
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-17
California	State Program	9	2886	03-31-18
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-17
Illinois	NELAP	5	003757	11-30-16 *
Iowa	State Program	7	373	12-01-16 *
Kansas	NELAP	7	E-10236	10-31-16 *
Kentucky (DW)	State Program	4	90125	12-31-16
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-17
Louisiana (DW)	NELAP	6	LA160008	12-31-16
Maryland	State Program	3	310	09-30-17
Missouri	State Program	7	780	06-30-17
Nevada	State Program	9	MO000542016-1	07-31-17

\* Certification renewal pending - certification considered valid.



# Certification Summary

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

TestAmerica Job ID: 280-87226-1

## Laboratory: TestAmerica St. Louis (Continued)


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

Authority	Program	EPA Region	Certification ID	Expiration Date
New Jersey	NELAP	2	MO002	06-30-17
New York	NELAP	2	11616	03-31-17
North Dakota	State Program	8	R207	06-30-17
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-17
Pennsylvania	NELAP	3	68-00540	02-28-17 *
South Carolina	State Program	4	85002001	06-30-16 *
Texas	NELAP	6	T104704193-15-9	07-31-17
USDA	Federal		P330-07-00122	01-09-17
Utah	NELAP	8	MO000542016-8	07-31-17
Virginia	NELAP	3	460230	06-14-17
Washington	State Program	10	C592	08-30-17
West Virginia DEP	State Program	3	381	08-31-16 *

\* Certification renewal pending - certification considered valid.

TestAmerica Denver

# Chain of Custody Record

<b>Client Information</b> Company: HDR Inc. Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State, Zip: CO, 80112 Phone: 720-633-2380(Tel) Email: anna.lundin@hdrinc.com Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		Sampler: <u>Stephanie K</u> Lab PM: <u>Stephanie K</u> Phone: <u>518-331-7027</u> E-Mail: <u>stephanie.kupper@testamericainc.com</u>		Carrier Tracking No(s): Lab #: Page <u>1</u> of <u>1</u>	
Due Date Requested: TAT Requested (days): <u>Standard</u>		Analyte(s) Requested:  280-87226 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:	
PO #: DEN-001 WO #: Project #: 28014371 SSOW#:		Total Number of Containers: <u>7</u>		Special Instructions/Note:	
<b>Sample Identification</b>		Perform MS/MSD (Yes or No)		Special Instructions/Note:	
Sample ID: MW-7 MW-8-5B MW-9-5B MW-10 Field Duplicate: MW-13D Equipment Blank: MW-13EB MW-13	Sample Date: 8/23/16 8/23/16 8/23/16 8/23/16 8/23/16	Sample Type (C=Comp, G=grab) G G G G G G	Matrix (W=water, S=solid, O=soil, BT=Tissue, A=Air) Water Water Water Water Water Water	Field Filtered Sample (Yes or No) N N N N N N	2540C - Total Dissolved Solids (TDS) Metals - 6020A, 7470A pH - 9040B, Anions - 9056A, 28D 2540D - Total Suspended Solids 9315, Ra226, 9320, Ra228
<b>Possible Hazard Identification</b> <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Empty Kit Relinquished by: <u>[Signature]</u> Date: 8/23/16 Relinquished by: <u>[Signature]</u> Date/Time: 8/23/16 1546 Relinquished by: <u>[Signature]</u> Date/Time: Relinquished by: <u>[Signature]</u> Date/Time:		Method of Shipment:		Received by: <u>[Signature]</u> Date/Time: 8-23-16 1548 Received by: <u>[Signature]</u> Date/Time: Received by: <u>[Signature]</u> Date/Time:	
Custody Seals Intact <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 3.1, 2.2 Ice 50.0 Transferv RP 8-23-16	





**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Sampler: <u>Lab PM: Rothmeyer, Steph</u>																																																							
Client Contact: <u>Shipping/Receiving</u>		Phone: <u>E-Mail: stephanie.rothmeyer@testamericainc.com</u>																																																							
Company: <u>TestAmerica Laboratories, Inc.</u>		COC No: <u>280-365181.1</u>																																																							
Address: <u>13715 Rider Trail North,</u>		Page: <u>Page 1 of 1</u>																																																							
City: <u>Earth City</u>		Job #: <u>280-87226-1</u>																																																							
State/Zip: <u>MO, 63045</u>		<b>Analysis Requested</b>																																																							
Phone: <u>314-298-6566(Tel) 314-298-8757(Fax)</u>		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 - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)																																																							
Project Name: <u>Xcel Energy GW CCR Monitoring - Cherokee</u>		Total Number of Containers: <u>2</u>																																																							
Site: <u>Xcel Energy CCR - Cherokee Station</u>		Special Instructions/Note:																																																							
Due Date Requested: <u>9/22/2016</u>		<table border="1"> <thead> <tr> <th>Sample Identification - Client ID (Lab ID)</th> <th>Sample Date</th> <th>Sample Time</th> <th>Sample Type (C=Comp, G=grab)</th> <th>Matrix (W=water, S=solid, O=waste/oli, BT=tissue Acid)</th> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB</th> <th>9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB</th> </tr> </thead> <tbody> <tr> <td>MW-7 (280-87226-1)</td> <td>8/23/16</td> <td>15:10 Mountain</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>MW-10 (280-87226-2)</td> <td>8/23/16</td> <td>12:55 Mountain</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>MW-13D (280-87226-3)</td> <td>8/23/16</td> <td>09:40 Mountain</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>MW-13EB (280-87226-4)</td> <td>8/23/16</td> <td>10:10 Mountain</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> <tr> <td>MW-13 (280-87226-5)</td> <td>8/23/16</td> <td>09:40 Mountain</td> <td>Water</td> <td>Water</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> </tr> </tbody> </table>		Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oli, BT=tissue Acid)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	MW-7 (280-87226-1)	8/23/16	15:10 Mountain	Water	Water	X	X	X	X	MW-10 (280-87226-2)	8/23/16	12:55 Mountain	Water	Water	X	X	X	X	MW-13D (280-87226-3)	8/23/16	09:40 Mountain	Water	Water	X	X	X	X	MW-13EB (280-87226-4)	8/23/16	10:10 Mountain	Water	Water	X	X	X	X	MW-13 (280-87226-5)	8/23/16	09:40 Mountain	Water	Water	X	X	X	X
Sample Identification - Client ID (Lab ID)	Sample Date			Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oli, BT=tissue Acid)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB																																															
MW-7 (280-87226-1)	8/23/16			15:10 Mountain	Water	Water	X	X	X	X																																															
MW-10 (280-87226-2)	8/23/16			12:55 Mountain	Water	Water	X	X	X	X																																															
MW-13D (280-87226-3)	8/23/16			09:40 Mountain	Water	Water	X	X	X	X																																															
MW-13EB (280-87226-4)	8/23/16			10:10 Mountain	Water	Water	X	X	X	X																																															
MW-13 (280-87226-5)	8/23/16	09:40 Mountain	Water	Water	X	X	X	X																																																	
TAT Requested (days):		Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <u>Months</u>																																																							
PO #:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																																							
WO #:		Special Instructions/QC Requirements:																																																							
Project #: <u>28014371</u>		Primary Deliverable Rank: <u>4</u>																																																							
SSOW#:		Empty Kit Relinquished by: _____ Date: _____																																																							
Relinquished by: <u>R. C. C.</u>		Relinquished by: <u>Steph</u>																																																							
Relinquished by: _____		Relinquished by: _____																																																							
Relinquished by: _____		Relinquished by: _____																																																							
Custody Seals Intact: <u>Yes</u>		Cooler Temperature(s) °C and Other Remarks:																																																							



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



<b>Client Information (Sub Contract Lab)</b> Client Contact: Stephanie K. Rothmeyer Shipping/Receiving: stephanie.rothmeyer@testamericainc.com Company: TestAmerica Laboratories, Inc.		Lab PM: Stephanie K. Rothmeyer E-Mail: stephanie.rothmeyer@testamericainc.com Carrier Tracking No(s): COC No: 280-365182.1 Page: 1 of 1 Job #: 280-87226-1						
Due Date Requested: 9/19/2016 TAT Requested (days): PO #: W/O #: Project #: 28014371 SOW#:		<b>Analysis Requested</b> 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 - Na2O/S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)						
Address: 4101 Shuffel Street NW, City: North Canton State, Zip: OH, 44720 Phone: 330-497-9396(Tel) 330-497-0772(Fax) Email:		Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 6020A/3005A 14 Metals (Includes B and Ca) - 1/2 - SUB						
Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Xcel Energy CCR - Cherokee Station		Total Number of Containers: 557 Special Instructions/Note:						
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waterfill, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 14 Metals (Includes B and Ca) - 1/2 - SUB	Use Collision Cell
MW-7 (280-87226-1)	8/23/16	15:10 Mountain		Water	X	X	X	1
MW-10 (280-87226-2)	8/23/16	12:55 Mountain		Water	X	X	X	1
MW-13D (280-87226-3)	8/23/16	09:40 Mountain		Water	X	X	X	1
MW-13EB (280-87226-4)	8/23/16	10:10 Mountain		Water	X	X	X	1
MW-13 (280-87226-5)	8/23/16	09:40 Mountain		Water	X	X	X	1
<b>Possible Hazard Identification</b> 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) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months Special Instructions/QC Requirements:								
Relinquished by: [Signature] Date/Time: 8/25/16 7:10 Company: TA		Relinquished by: [Signature] Date/Time: Company:		Relinquished by: [Signature] Date/Time: Company:		Method of Shipment: Cooler Temperature(s) °C and Other Remarks:		





TestAmerica Canton Sample Receipt Form/Narrative

Login # : \_\_\_\_\_

Canton Facility

Cooler unpacked by:

Client Denver Site Name \_\_\_\_\_

Cooler Received on 8-25-16 Opened on 8-25-16

FedEx: 1<sup>st</sup> Grd Exp UPS FAS Stetson 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  
IR GUN# IR-8 (CF +1.3 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  
IR GUN #36 (CF +1.0°C) Observed Cooler Temp. 3.0 °C Corrected Cooler Temp. 4.0 °C
- 2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1  Yes No   
-Were custody seals on the outside of the cooler(s) signed & dated?  Yes  No NA
- Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?  Yes  No
- 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 11-15 have been checked at the originating laboratory.  Yes  No NA pH Strip Lot# HC574756
- 11. Were sample(s) at the correct pH upon receipt?  Yes  No
- 12. Were VOAs on the COC?  Yes  No NA
- 13. Were air bubbles >6 mm in any VOA vials?  Yes  No
- 14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_  Yes  No
- 15. Was a LL Hg or Me Hg trip blank present? \_\_\_\_\_  Yes  No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other \_\_\_\_\_

Concerning \_\_\_\_\_

Samples processed by:

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. 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)

16. 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: 280-87226-1

**Login Number: 87226**

**List Source: TestAmerica Denver**

**List Number: 1**

**Creator: Woodworth, Sean P**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> 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	Limited volume received.
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 <math><6\text{mm}</math> (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: 280-87226-1

**Login Number: 87226**  
**List Number: 3**  
**Creator: Daniels, Brian J**

**List Source: TestAmerica St. Louis**  
**List Creation: 08/25/16 02:32 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	3.3,2.8
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-87226-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-87226-1	MW-7	52.4
280-87226-2	MW-10	85.2
280-87226-3	MW-13D	87.7
280-87226-4	MW-13EB	86.3
280-87226-5	MW-13	81.8
LCS 160-267408/2-A	Lab Control Sample	84.6
LCSD 160-267408/3-A	Lab Control Sample Dup	75.5
MB 160-267408/1-A	Method Blank	83.5

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-87226-1	MW-7	52.4	79.3
280-87226-2	MW-10	85.2	83.7
280-87226-3	MW-13D	87.7	82.6
280-87226-4	MW-13EB	86.3	84.5
280-87226-5	MW-13	81.8	84.9
LCS 160-267411/2-A	Lab Control Sample	84.6	83.4
LCSD 160-267411/3-A	Lab Control Sample Dup	75.5	80.7
MB 160-267411/1-A	Method Blank	83.5	81.9

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = 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: 280-90696-1  
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:  
12/15/2016 4:36:02 PM

Stephanie Rothmeyer, Project Manager I  
(303)736-0182  
[stephanie.rothmeyer@testamericainc.com](mailto:stephanie.rothmeyer@testamericainc.com)

### LINKS

Review your project  
results through  
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Have a Question?



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[www.testamericainc.com](http://www.testamericainc.com)

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

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 280-90696-1

## 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.
F1	MS and/or MSD Recovery is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.

### 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.
▫	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, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-90696-1

**Job ID: 280-90696-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-90696-1**

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 11/8/2016 at 5:15 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.3° C, 0.9° C and 1.1° C.

Per client request, Sample ID Field Duplicate was changed to MW-13D and Sample ID Equipment Blank was changed to MW-9EB.

### **TOTAL RECOVERABLE METALS**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/11/2016 and 11/12/2016 and analyzed on 11/14/2016.

Boron failed the recovery criteria high for the MS and MSD of sample MW-8 (280-90696-1) in batch 240-255599. 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 RECOVERABLE METALS (ICPMS)**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 11/11/2016, 11/12/2016 and 12/08/2016 and analyzed on 11/19/2016, 12/02/2016, 12/09/2016 and 12/12/2016.

Lead was detected in method blank MB 240-255364/1-A at a level exceeding 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.

Calcium and Lithium were detected in method blank MB 240-255364/1-A 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.

Barium, Calcium and Lead were detected in method blank MB 240-255444/1-A at levels that were above the method detection limit but

# Case Narrative

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

TestAmerica Job ID: 280-90696-1

## Job ID: 280-90696-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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.

Lead was detected in method blank MB 240-258623/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Calcium and Molybdenum failed the recovery criteria high for the MS of sample MW-8 (280-90696-1) in batch 240-258041. Calcium failed the recovery criteria high for the MSD. 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-9 (280-90696-2)[5X] and MW-9EB (280-90696-5)[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.

### **TOTAL MERCURY**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 11/22/2016.

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

### **TOTAL DISSOLVED SOLIDS**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 11/11/2016 and 11/14/2016.

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

### **TOTAL SUSPENDED SOLIDS**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 11/10/2016.

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

### **CORROSIVITY (PH)**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 11/16/2016 and 11/21/2016.

Analysis for pH was done twice for sample MW-9EB (280-90696-5), and the pH did not stabilize in both analyses. Results are consistent, so they are reported.

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

### **ANIONS (28 DAYS)**

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/02/2016 and 12/03/2016.

Chloride failed the recovery criteria high for the MSD of sample 280-91667-11 in batch 280-353988. 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.

# Case Narrative

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

TestAmerica Job ID: 280-90696-1

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## Job ID: 280-90696-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

Samples MW-8 (280-90696-1)[10X], MW-9 (280-90696-2)[10X], MW-10 (280-90696-3)[10X], MW-13D (280-90696-4)[5X] and MW-13 (280-90696-6)[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-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 11/11/2016 and analyzed on 12/13/2016.

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

### RADIUM-228

Samples MW-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 11/11/2016 and analyzed on 12/13/2016.

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-8 (280-90696-1), MW-9 (280-90696-2), MW-10 (280-90696-3), MW-13D (280-90696-4), MW-9EB (280-90696-5) and MW-13 (280-90696-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 12/15/2016.

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: 280-90696-1

## Client Sample ID: MW-8

## Lab Sample ID: 280-90696-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	4100		200	8.1	ug/L	1		6010C	Total
Antimony	0.00030	J	0.0020	0.00027	mg/L	1		6020A	Recoverable Total
Arsenic	0.0030	J	0.0050	0.00035	mg/L	1		6020A	Recoverable Total
Barium	0.050		0.0050	0.00052	mg/L	1		6020A	Recoverable Total
Cadmium	0.00090	J	0.0010	0.00031	mg/L	1		6020A	Recoverable Total
Calcium	160	B	1.0	0.043	mg/L	1		6020A	Recoverable Total
Chromium	0.0020		0.0020	0.00026	mg/L	1		6020A	Recoverable Total
Cobalt	0.0040		0.0010	0.00013	mg/L	1		6020A	Recoverable Total
Lead	0.0022	B	0.0010	0.00016	mg/L	1		6020A	Recoverable Total
Lithium	0.11		0.0080	0.00016	mg/L	1		6020A	Recoverable Total
Molybdenum	0.0085	J F1	0.010	0.00051	mg/L	1		6020A	Recoverable Total
Selenium	0.019		0.0050	0.00048	mg/L	1		6020A	Recoverable Total
pH adj. to 25 deg C	7.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.1	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	500		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1500		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	29		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9

## Lab Sample ID: 280-90696-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2400		200	8.1	ug/L	1		6010C	Total
Antimony	0.0015	J	0.0020	0.00027	mg/L	1		6020A	Recoverable Total
Arsenic	0.0031	J	0.0050	0.00035	mg/L	1		6020A	Recoverable Total
Barium	0.043		0.0050	0.00052	mg/L	1		6020A	Recoverable Total
Cadmium	0.0016		0.0010	0.00031	mg/L	1		6020A	Recoverable Total
Calcium	290	B	1.0	0.043	mg/L	1		6020A	Recoverable Total
Chromium	0.00026	J	0.0020	0.00026	mg/L	1		6020A	Recoverable Total
Cobalt	0.0011		0.0010	0.00013	mg/L	1		6020A	Recoverable Total
Lead	0.00083	J B	0.0010	0.00016	mg/L	1		6020A	Recoverable Total
Lithium	0.081	B	0.040	0.00080	mg/L	5		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: 280-90696-1

## Client Sample ID: MW-9 (Continued)

## Lab Sample ID: 280-90696-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.033		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0049	J	0.0050	0.00048	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	23.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	490		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.7		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	960		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2300		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 280-90696-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1300		200	8.1	ug/L	1		6010C	Total Recoverable
Antimony	0.0024		0.0020	0.00027	mg/L	1		6020A	Total Recoverable
Arsenic	0.0032	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.075	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Cadmium	0.00090	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	270	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00043	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.0019		0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.031		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0043	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.7	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.0	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	490		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	920		50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13D

## Lab Sample ID: 280-90696-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	730		200	8.1	ug/L	1		6010C	Total Recoverable
Arsenic	0.00077	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.099		0.0050	0.00052	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: 280-90696-1

## Client Sample ID: MW-13D (Continued)

## Lab Sample ID: 280-90696-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	180	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00032	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.00028	J	0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.00047	J B	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.036		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0018	J	0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0050		0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	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	200		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	240		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.6	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9EB

## Lab Sample ID: 280-90696-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	0.064	J B	1.0	0.043	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.1	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Total Dissolved Solids (TDS)	27		10	4.7	mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-90696-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	730		200	8.1	ug/L	1		6010C	Total Recoverable
Arsenic	0.00075	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.10		0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Calcium	180	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00030	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.00024	J	0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0018	J	0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0051		0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.6	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	200		15	1.3	mg/L	5		9056A	Total/NA
Fluoride	1.2		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: 280-90696-1

**Client Sample ID: MW-13 (Continued)**

**Lab Sample ID: 280-90696-6**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	240		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Denver

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# Method Summary

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

TestAmerica Job ID: 280-90696-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-90696-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-90696-1	MW-8	Ground Water	11/08/16 12:15	11/08/16 17:15
280-90696-2	MW-9	Ground Water	11/07/16 16:40	11/08/16 17:15
280-90696-3	MW-10	Ground Water	11/07/16 15:15	11/08/16 17:15
280-90696-4	MW-13D	Ground Water	11/07/16 12:00	11/08/16 17:15
280-90696-5	MW-9EB	Water	11/08/16 10:30	11/08/16 17:15
280-90696-6	MW-13	Ground Water	11/07/16 11:45	11/08/16 17:15

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# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	4100		200	8.1	ug/L		11/11/16 14:00	11/14/16 18:35	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2400		200	8.1	ug/L		11/11/16 14:00	11/14/16 19:13	1

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1300		200	8.1	ug/L		11/12/16 15:00	11/14/16 18:22	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	730		200	8.1	ug/L		11/11/16 14:00	11/14/16 19:18	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	8.1	ug/L		11/11/16 14:00	11/14/16 19:22	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	730		200	8.1	ug/L		11/11/16 14:00	11/14/16 19:26	1

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

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00030	J	0.0020	0.00027	mg/L		11/11/16 14:00	12/02/16 18:30	1
Arsenic	0.0030	J	0.0050	0.00035	mg/L		11/11/16 14:00	12/02/16 18:30	1
Barium	0.050		0.0050	0.00052	mg/L		11/11/16 14:00	12/02/16 18:30	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/02/16 18:30	1
Cadmium	0.00090	J	0.0010	0.00031	mg/L		11/11/16 14:00	12/02/16 18:30	1
Calcium	160	B	1.0	0.043	mg/L		11/11/16 14:00	12/02/16 18:30	1
Chromium	0.0020		0.0020	0.00026	mg/L		11/11/16 14:00	12/02/16 18:30	1
Cobalt	0.0040		0.0010	0.00013	mg/L		11/11/16 14:00	12/02/16 18:30	1
Lead	0.0022	B	0.0010	0.00016	mg/L		12/08/16 14:00	12/09/16 10:58	1
Lithium	0.11		0.0080	0.00016	mg/L		12/08/16 14:00	12/09/16 10:58	1
Molybdenum	0.0085	J F1	0.010	0.00051	mg/L		11/11/16 14:00	12/02/16 18:30	1
Selenium	0.019		0.0050	0.00048	mg/L		11/11/16 14:00	12/02/16 18:30	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/02/16 18:30	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0015	J	0.0020	0.00027	mg/L		11/11/16 14:00	12/02/16 18:58	1
Arsenic	0.0031	J	0.0050	0.00035	mg/L		11/11/16 14:00	12/02/16 18:58	1
Barium	0.043		0.0050	0.00052	mg/L		11/11/16 14:00	12/02/16 18:58	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/02/16 18:58	1
Cadmium	0.0016		0.0010	0.00031	mg/L		11/11/16 14:00	12/02/16 18:58	1
Calcium	290	B	1.0	0.043	mg/L		11/11/16 14:00	12/02/16 18:58	1
Chromium	0.00026	J	0.0020	0.00026	mg/L		11/11/16 14:00	12/02/16 18:58	1
Cobalt	0.0011		0.0010	0.00013	mg/L		11/11/16 14:00	12/02/16 18:58	1
Lead	0.00083	J B	0.0010	0.00016	mg/L		11/11/16 14:00	12/02/16 18:58	1
Lithium	0.081	B	0.040	0.00080	mg/L		11/11/16 14:00	12/12/16 15:05	5
Molybdenum	0.033		0.010	0.00051	mg/L		11/11/16 14:00	12/02/16 18:58	1
Selenium	0.0049	J	0.0050	0.00048	mg/L		11/11/16 14:00	12/02/16 18:58	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/02/16 18:58	1

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0024		0.0020	0.00027	mg/L		11/12/16 15:00	11/19/16 21:28	1
Arsenic	0.0032	J	0.0050	0.00035	mg/L		11/12/16 15:00	11/19/16 21:28	1
Barium	0.075	B	0.0050	0.00052	mg/L		11/12/16 15:00	11/19/16 21:28	1
Beryllium	ND		0.0010	0.00040	mg/L		11/12/16 15:00	11/19/16 21:28	1
Cadmium	0.00090	J	0.0010	0.00031	mg/L		11/12/16 15:00	11/19/16 21:28	1
Calcium	270	B	1.0	0.043	mg/L		11/12/16 15:00	11/19/16 21:28	1
Chromium	0.00043	J	0.0020	0.00026	mg/L		11/12/16 15:00	11/19/16 21:28	1
Cobalt	0.0019		0.0010	0.00013	mg/L		11/12/16 15:00	11/19/16 21:28	1
Lead	ND		0.0010	0.00016	mg/L		11/12/16 15:00	11/19/16 21:28	1
Lithium	0.11		0.0080	0.00016	mg/L		11/12/16 15:00	11/19/16 21:28	1
Molybdenum	0.031		0.010	0.00051	mg/L		11/12/16 15:00	11/19/16 21:28	1
Selenium	0.0043	J	0.0050	0.00048	mg/L		11/12/16 15:00	11/19/16 21:28	1
Thallium	ND		0.0010	0.00028	mg/L		11/12/16 15:00	11/19/16 21:28	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		11/11/16 14:00	12/02/16 19:11	1
Arsenic	0.00077	J	0.0050	0.00035	mg/L		11/11/16 14:00	12/02/16 19:11	1
Barium	0.099		0.0050	0.00052	mg/L		11/11/16 14:00	12/02/16 19:11	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/02/16 19:11	1
Cadmium	ND		0.0010	0.00031	mg/L		11/11/16 14:00	12/02/16 19:11	1
Calcium	180	B	1.0	0.043	mg/L		11/11/16 14:00	12/02/16 19:11	1
Chromium	0.00032	J	0.0020	0.00026	mg/L		11/11/16 14:00	12/02/16 19:11	1
Cobalt	0.00028	J	0.0010	0.00013	mg/L		11/11/16 14:00	12/02/16 19:11	1
Lead	0.00047	J B	0.0010	0.00016	mg/L		12/08/16 14:00	12/09/16 11:35	1
Lithium	0.036		0.0080	0.00016	mg/L		12/08/16 14:00	12/09/16 11:35	1
Molybdenum	0.0018	J	0.010	0.00051	mg/L		11/11/16 14:00	12/02/16 19:11	1
Selenium	0.0050		0.0050	0.00048	mg/L		11/11/16 14:00	12/02/16 19:11	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/02/16 19:11	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		11/11/16 14:00	12/02/16 19:15	1
Arsenic	ND		0.0050	0.00035	mg/L		11/11/16 14:00	12/02/16 19:15	1
Barium	ND		0.0050	0.00052	mg/L		11/11/16 14:00	12/02/16 19:15	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/02/16 19:15	1
Cadmium	ND		0.0010	0.00031	mg/L		11/11/16 14:00	12/02/16 19:15	1
<b>Calcium</b>	<b>0.064</b>	<b>J B</b>	1.0	0.043	mg/L		11/11/16 14:00	12/02/16 19:15	1
Chromium	ND		0.0020	0.00026	mg/L		11/11/16 14:00	12/02/16 19:15	1
Cobalt	ND		0.0010	0.00013	mg/L		11/11/16 14:00	12/02/16 19:15	1
Lead	ND		0.0010	0.00016	mg/L		11/11/16 14:00	12/02/16 19:15	1
Lithium	ND		0.040	0.00080	mg/L		11/11/16 14:00	12/12/16 15:09	5
Molybdenum	ND		0.010	0.00051	mg/L		11/11/16 14:00	12/02/16 19:15	1
Selenium	ND		0.0050	0.00048	mg/L		11/11/16 14:00	12/02/16 19:15	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/02/16 19:15	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Arsenic</b>	<b>0.00075</b>	<b>J</b>	0.0050	0.00035	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Barium</b>	<b>0.10</b>		0.0050	0.00052	mg/L		11/11/16 14:00	12/02/16 19:19	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/02/16 19:19	1
Cadmium	ND		0.0010	0.00031	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Calcium</b>	<b>180</b>	<b>B</b>	1.0	0.043	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Chromium</b>	<b>0.00030</b>	<b>J</b>	0.0020	0.00026	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Cobalt</b>	<b>0.00024</b>	<b>J</b>	0.0010	0.00013	mg/L		11/11/16 14:00	12/02/16 19:19	1
Lead	ND		0.0010	0.00016	mg/L		11/11/16 14:00	12/02/16 19:19	1
Lithium	ND		0.0080	0.00016	mg/L		11/11/16 14:00	12/09/16 12:17	1
<b>Molybdenum</b>	<b>0.0018</b>	<b>J</b>	0.010	0.00051	mg/L		11/11/16 14:00	12/02/16 19:19	1
<b>Selenium</b>	<b>0.0051</b>		0.0050	0.00048	mg/L		11/11/16 14:00	12/02/16 19:19	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/02/16 19:19	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:02	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:09	1

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:11	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:13	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:20	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 18:22	1

## General Chemistry

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground 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			11/16/16 15:51	1
Temperature	23.1	HF	1.0	1.0	Degrees C			11/16/16 15:51	1
Chloride	500		30	2.5	mg/L			12/02/16 23:28	10
Fluoride	1.2		0.50	0.060	mg/L			12/02/16 16:09	1
Sulfate	1500		50	2.3	mg/L			12/02/16 23:28	10
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			11/14/16 10:35	1
Total Suspended Solids	29		4.0	1.1	mg/L			11/10/16 16:34	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU			11/16/16 15:56	1
Temperature	23.0	HF	1.0	1.0	Degrees C			11/16/16 15:56	1
Chloride	490		30	2.5	mg/L			12/02/16 23:46	10
Fluoride	2.7		0.50	0.060	mg/L			12/02/16 16:27	1
Sulfate	960		50	2.3	mg/L			12/02/16 23:46	10
Total Dissolved Solids (TDS)	2300		20	9.4	mg/L			11/11/16 10:13	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			11/10/16 16:34	1

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.7	HF	0.1	0.1	SU			11/16/16 15:59	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

## General Chemistry (Continued)

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	23.0	HF	1.0	1.0	Degrees C			11/16/16 15:59	1
Chloride	490		30	2.5	mg/L			12/03/16 00:03	10
Fluoride	2.5		0.50	0.060	mg/L			12/02/16 16:45	1
Sulfate	920		50	2.3	mg/L			12/03/16 00:03	10
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L			11/11/16 10:13	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			11/10/16 16:34	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground 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			11/16/16 16:04	1
Temperature	23.2	HF	1.0	1.0	Degrees C			11/16/16 16:04	1
Chloride	200		15	1.3	mg/L			12/03/16 00:21	5
Fluoride	1.2		0.50	0.060	mg/L			12/02/16 17:02	1
Sulfate	240		25	1.2	mg/L			12/03/16 00:21	5
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L			11/11/16 10:13	1
Total Suspended Solids	1.6	J	4.0	1.1	mg/L			11/10/16 16:34	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.1	HF	0.1	0.1	SU			11/21/16 10:54	1
Temperature	21.3	HF	1.0	1.0	Degrees C			11/21/16 10:54	1
Chloride	ND		3.0	0.25	mg/L			12/02/16 15:15	1
Fluoride	ND		0.50	0.060	mg/L			12/02/16 15:15	1
Sulfate	ND		5.0	0.23	mg/L			12/02/16 15:15	1
Total Dissolved Solids (TDS)	27		10	4.7	mg/L			11/14/16 10:35	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/10/16 16:34	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground 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			11/16/16 16:15	1
Temperature	23.3	HF	1.0	1.0	Degrees C			11/16/16 16:15	1
Chloride	200		15	1.3	mg/L			12/03/16 00:39	5
Fluoride	1.2		0.50	0.060	mg/L			12/02/16 17:20	1
Sulfate	240		25	1.2	mg/L			12/03/16 00:39	5
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L			11/11/16 10:13	1
Total Suspended Solids	ND		4.0	1.1	mg/L			11/10/16 16:34	1

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.504		0.298	0.301	1.00	0.378	pCi/L	11/11/16 13:24	12/13/16 20:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110					11/11/16 13:24	12/13/16 20:04	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.444		0.296	0.299	1.00	0.405	pCi/L	11/11/16 13:24	12/13/16 20:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		40 - 110					11/11/16 13:24	12/13/16 20:04	1

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.492		0.314	0.317	1.00	0.422	pCi/L	11/11/16 13:24	12/13/16 20:04	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.2		40 - 110					11/11/16 13:24	12/13/16 20:04	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.758		0.354	0.361	1.00	0.405	pCi/L	11/11/16 13:24	12/13/16 20:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.5		40 - 110					11/11/16 13:24	12/13/16 20:05	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.215	U	0.277	0.277	1.00	0.461	pCi/L	11/11/16 13:24	12/13/16 20:05	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110					11/11/16 13:24	12/13/16 20:05	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.387</b>		0.260	0.263	1.00	0.345	pCi/L	11/11/16 13:24	12/13/16 20:06	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.1		40 - 110					11/11/16 13:24	12/13/16 20:06	1

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

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.659</b>		0.307	0.313	1.00	0.448	pCi/L	11/11/16 14:15	12/13/16 13:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110					11/11/16 14:15	12/13/16 13:49	1
Y Carrier	87.9		40 - 110					11/11/16 14:15	12/13/16 13:49	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>0.820</b>		0.290	0.300	1.00	0.378	pCi/L	11/11/16 14:15	12/13/16 13:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	82.6		40 - 110					11/11/16 14:15	12/13/16 13:49	1
Y Carrier	89.0		40 - 110					11/11/16 14:15	12/13/16 13:49	1

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-228</b>	<b>1.15</b>		0.348	0.364	1.00	0.444	pCi/L	11/11/16 14:15	12/13/16 13:49	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	77.2		40 - 110					11/11/16 14:15	12/13/16 13:49	1
Y Carrier	86.7		40 - 110					11/11/16 14:15	12/13/16 13:49	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.988		0.358	0.369	1.00	0.497	pCi/L	11/11/16 14:15	12/13/16 13:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	79.5		40 - 110					11/11/16 14:15	12/13/16 13:50	1
Y Carrier	87.9		40 - 110					11/11/16 14:15	12/13/16 13:50	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.812		0.293	0.302	1.00	0.398	pCi/L	11/11/16 14:15	12/13/16 13:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	84.0		40 - 110					11/11/16 14:15	12/13/16 13:50	1
Y Carrier	91.2		40 - 110					11/11/16 14:15	12/13/16 13:50	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.200	U	0.257	0.258	1.00	0.428	pCi/L	11/11/16 14:15	12/13/16 13:50	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	80.1		40 - 110					11/11/16 14:15	12/13/16 13:50	1
Y Carrier	88.6		40 - 110					11/11/16 14:15	12/13/16 13:50	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.16		0.428	0.434	5.00	0.448	pCi/L		12/15/16 15:01	1

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.26		0.415	0.423	5.00	0.405	pCi/L		12/15/16 15:01	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-90696-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-10**  
**Date Collected: 11/07/16 15:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.64		0.469	0.483	5.00	0.444	pCi/L		12/15/16 15:01	1

**Client Sample ID: MW-13D**  
**Date Collected: 11/07/16 12:00**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.75		0.504	0.516	5.00	0.497	pCi/L		12/15/16 15:01	1

**Client Sample ID: MW-9EB**  
**Date Collected: 11/08/16 10:30**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.03		0.403	0.410	5.00	0.461	pCi/L		12/15/16 15:01	1

**Client Sample ID: MW-13**  
**Date Collected: 11/07/16 11:45**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-6**  
**Matrix: Ground Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.587		0.366	0.368	5.00	0.428	pCi/L		12/15/16 15:01	1



# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-255364/1-A  
Matrix: Water  
Analysis Batch: 255599

Client Sample ID: Method Blank  
Prep Type: Total Recoverable  
Prep Batch: 255364

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	8.1	ug/L		11/11/16 14:00	11/14/16 18:27	1

Lab Sample ID: LCS 240-255364/2-A  
Matrix: Water  
Analysis Batch: 255599

Client Sample ID: Lab Control Sample  
Prep Type: Total Recoverable  
Prep Batch: 255364

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	1000	1020		ug/L		102	80 - 120

Lab Sample ID: 280-90696-1 MS  
Matrix: Ground Water  
Analysis Batch: 255599

Client Sample ID: MW-8  
Prep Type: Total Recoverable  
Prep Batch: 255364

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Boron	4100		1000	5800	4	ug/L		166	75 - 125

Lab Sample ID: 280-90696-1 MSD  
Matrix: Ground Water  
Analysis Batch: 255599

Client Sample ID: MW-8  
Prep Type: Total Recoverable  
Prep Batch: 255364

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Boron	4100		1000	5740	4	ug/L		161	75 - 125	1	20

Lab Sample ID: MB 240-255444/1-A  
Matrix: Water  
Analysis Batch: 255599

Client Sample ID: Method Blank  
Prep Type: Total Recoverable  
Prep Batch: 255444

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		200	8.1	ug/L		11/12/16 15:00	11/14/16 17:19	1

Lab Sample ID: LCS 240-255444/2-A  
Matrix: Water  
Analysis Batch: 255599

Client Sample ID: Lab Control Sample  
Prep Type: Total Recoverable  
Prep Batch: 255444

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Boron	1000	1080		ug/L		108	80 - 120

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

Lab Sample ID: MB 240-255364/1-A  
Matrix: Water  
Analysis Batch: 258864

Client Sample ID: Method Blank  
Prep Type: Total Recoverable  
Prep Batch: 255364

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		11/11/16 14:00	12/09/16 11:52	1
Arsenic	ND		0.0050	0.00035	mg/L		11/11/16 14:00	12/09/16 11:52	1
Barium	ND		0.0050	0.00052	mg/L		11/11/16 14:00	12/09/16 11:52	1
Beryllium	ND		0.0010	0.00040	mg/L		11/11/16 14:00	12/09/16 11:52	1
Cadmium	ND		0.0010	0.00031	mg/L		11/11/16 14:00	12/09/16 11:52	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: MB 240-255364/1-A**  
**Matrix: Water**  
**Analysis Batch: 258864**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255364**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Calcium	0.173	J	1.0	0.043	mg/L		11/11/16 14:00	12/09/16 11:52	1
Chromium	ND		0.0020	0.00026	mg/L		11/11/16 14:00	12/09/16 11:52	1
Cobalt	ND		0.0010	0.00013	mg/L		11/11/16 14:00	12/09/16 11:52	1
Lead	0.00881		0.0010	0.00016	mg/L		11/11/16 14:00	12/09/16 11:52	1
Lithium	0.00487	J	0.0080	0.00016	mg/L		11/11/16 14:00	12/09/16 11:52	1
Molybdenum	ND		0.010	0.00051	mg/L		11/11/16 14:00	12/09/16 11:52	1
Selenium	ND		0.0050	0.00048	mg/L		11/11/16 14:00	12/09/16 11:52	1
Thallium	ND		0.0010	0.00028	mg/L		11/11/16 14:00	12/09/16 11:52	1

**Lab Sample ID: LCS 240-255364/3-A**  
**Matrix: Water**  
**Analysis Batch: 258864**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255364**

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
Antimony	0.100	0.115		mg/L		115	80 - 120
Arsenic	1.00	1.03		mg/L		103	80 - 120
Barium	1.00	1.14		mg/L		114	80 - 120
Beryllium	1.00	1.10		mg/L		110	80 - 120
Cadmium	1.00	1.14		mg/L		114	80 - 120
Calcium	10.0	11.4		mg/L		114	80 - 120
Chromium	1.00	1.14		mg/L		114	80 - 120
Cobalt	1.00	1.17		mg/L		117	80 - 120
Lead	1.00	1.20		mg/L		120	80 - 120
Lithium	0.100	0.104		mg/L		104	80 - 120
Molybdenum	0.100	0.111		mg/L		111	80 - 120
Selenium	1.00	1.10		mg/L		110	80 - 120
Thallium	0.250	0.284		mg/L		114	80 - 120

**Lab Sample ID: 280-90696-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 258041**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255364**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS MS		Unit	D	%Rec	%Rec. Limits
				Result	Qualifier				
Antimony	0.00030	J	0.100	0.100		mg/L		100	75 - 125
Arsenic	0.0030	J	1.00	0.929		mg/L		93	75 - 125
Barium	0.050		1.00	1.06		mg/L		101	75 - 125
Beryllium	ND		1.00	0.988		mg/L		99	75 - 125
Cadmium	0.00090	J	1.00	0.889		mg/L		89	75 - 125
Calcium	160	B	10.0	445	4 B	mg/L		2833	75 - 125
Chromium	0.0020		1.00	0.968		mg/L		97	75 - 125
Cobalt	0.0040		1.00	0.960		mg/L		96	75 - 125
Molybdenum	0.0085	J F1	0.100	0.135	F1	mg/L		126	75 - 125
Selenium	0.019		1.00	0.948		mg/L		93	75 - 125
Thallium	ND		0.250	0.246		mg/L		98	75 - 125

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: 280-90696-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 258041**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255364**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Antimony	0.00030	J	0.100	0.0936		mg/L		93	75 - 125	7	20
Arsenic	0.0030	J	1.00	0.890		mg/L		89	75 - 125	4	20
Barium	0.050		1.00	1.04		mg/L		99	75 - 125	1	20
Beryllium	ND		1.00	0.984		mg/L		98	75 - 125	0	20
Cadmium	0.00090	J	1.00	0.873		mg/L		87	75 - 125	2	20
Calcium	160	B	10.0	442	4 B	mg/L		2804	75 - 125	1	20
Chromium	0.0020		1.00	0.953		mg/L		95	75 - 125	2	20
Cobalt	0.0040		1.00	0.952		mg/L		95	75 - 125	1	20
Molybdenum	0.0085	J F1	0.100	0.125		mg/L		117	75 - 125	7	20
Selenium	0.019		1.00	0.928		mg/L		91	75 - 125	2	20
Thallium	ND		0.250	0.241		mg/L		96	75 - 125	2	20

**Lab Sample ID: MB 240-255444/1-A**  
**Matrix: Water**  
**Analysis Batch: 256468**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255444**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		11/12/16 15:00	11/19/16 20:38	1
Arsenic	ND		0.0050	0.00035	mg/L		11/12/16 15:00	11/19/16 20:38	1
<b>Barium</b>	<b>0.00106</b>	<b>J</b>	0.0050	0.00052	mg/L		11/12/16 15:00	11/19/16 20:38	1
Beryllium	ND		0.0010	0.00040	mg/L		11/12/16 15:00	11/19/16 20:38	1
Cadmium	ND		0.0010	0.00031	mg/L		11/12/16 15:00	11/19/16 20:38	1
<b>Calcium</b>	<b>0.214</b>	<b>J</b>	1.0	0.043	mg/L		11/12/16 15:00	11/19/16 20:38	1
Chromium	ND		0.0020	0.00026	mg/L		11/12/16 15:00	11/19/16 20:38	1
Cobalt	ND		0.0010	0.00013	mg/L		11/12/16 15:00	11/19/16 20:38	1
<b>Lead</b>	<b>0.000200</b>	<b>J</b>	0.0010	0.00016	mg/L		11/12/16 15:00	11/19/16 20:38	1
Lithium	ND		0.0080	0.00016	mg/L		11/12/16 15:00	11/19/16 20:38	1
Molybdenum	ND		0.010	0.00051	mg/L		11/12/16 15:00	11/19/16 20:38	1
Selenium	ND		0.0050	0.00048	mg/L		11/12/16 15:00	11/19/16 20:38	1
Thallium	ND		0.0010	0.00028	mg/L		11/12/16 15:00	11/19/16 20:38	1

**Lab Sample ID: LCS 240-255444/3-A**  
**Matrix: Water**  
**Analysis Batch: 256468**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255444**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Antimony	0.100	0.0973		mg/L		97	80 - 120
Arsenic	1.00	1.04		mg/L		104	80 - 120
Barium	1.00	1.03		mg/L		103	80 - 120
Beryllium	1.00	1.10		mg/L		110	80 - 120
Cadmium	1.00	1.09		mg/L		109	80 - 120
Calcium	10.0	9.93		mg/L		99	80 - 120
Chromium	1.00	1.03		mg/L		103	80 - 120
Cobalt	1.00	1.09		mg/L		109	80 - 120
Lead	1.00	1.05		mg/L		105	80 - 120
Lithium	0.100	0.0968		mg/L		97	80 - 120
Molybdenum	0.100	0.0978		mg/L		98	80 - 120
Selenium	1.00	0.920		mg/L		92	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: LCS 240-255444/3-A**  
**Matrix: Water**  
**Analysis Batch: 256468**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 255444**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Thallium	0.250	0.256		mg/L		102	80 - 120

**Lab Sample ID: MB 240-258623/1-A**  
**Matrix: Water**  
**Analysis Batch: 258864**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 258623**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	0.000493	J	0.0010	0.00016	mg/L		12/08/16 14:00	12/09/16 11:06	1
Lithium	ND		0.0080	0.00016	mg/L		12/08/16 14:00	12/09/16 11:06	1

**Lab Sample ID: LCS 240-258623/2-A**  
**Matrix: Water**  
**Analysis Batch: 258864**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 258623**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	1.00	1.09		mg/L		109	80 - 120
Lithium	0.100	0.0846		mg/L		85	80 - 120

**Lab Sample ID: 280-90696-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 258864**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 258623**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Lead	0.0022	B	1.00	0.983		mg/L		98	75 - 125
Lithium	0.11		0.100	0.197		mg/L		91	75 - 125

**Lab Sample ID: 280-90696-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 258864**

**Client Sample ID: MW-8**  
**Prep Type: Total Recoverable**  
**Prep Batch: 258623**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Lead	0.0022	B	1.00	1.03		mg/L		102	75 - 125	4	20
Lithium	0.11		0.100	0.209		mg/L		102	75 - 125	6	20

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-352593/1-A**  
**Matrix: Water**  
**Analysis Batch: 352806**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 352593**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.20	0.027	ug/L		11/22/16 11:20	11/22/16 17:28	1

**Lab Sample ID: LCS 280-352593/2-A**  
**Matrix: Water**  
**Analysis Batch: 352806**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 352593**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	5.00	5.10		ug/L		102	84 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: 280-90696-1 MS**  
**Matrix: Ground Water**  
**Analysis Batch: 352806**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 352593**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		5.00	4.98		ug/L		100	75 - 125

**Lab Sample ID: 280-90696-1 MSD**  
**Matrix: Ground Water**  
**Analysis Batch: 352806**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 352593**  
**%Rec.**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		5.00	5.04		ug/L		101	75 - 125	1	20

## Method: 9040B - pH

**Lab Sample ID: LCS 280-351913/29**  
**Matrix: Water**  
**Analysis Batch: 351913**

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

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

**Lab Sample ID: LCS 280-352485/4**  
**Matrix: Water**  
**Analysis Batch: 352485**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%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 280-353988/6**  
**Matrix: Water**  
**Analysis Batch: 353988**

**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			12/02/16 10:52	1
Fluoride	ND		0.50	0.060	mg/L			12/02/16 10:52	1
Sulfate	ND		5.0	0.23	mg/L			12/02/16 10:52	1

**Lab Sample ID: LCS 280-353988/4**  
**Matrix: Water**  
**Analysis Batch: 353988**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Chloride	100	101		mg/L		101	90 - 110
Fluoride	5.00	5.08		mg/L		102	90 - 110
Sulfate	100	101		mg/L		101	90 - 110

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: LCSD 280-353988/5**  
**Matrix: Water**  
**Analysis Batch: 353988**

**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	5.10		mg/L		102	90 - 110	0	10
Sulfate	100	100		mg/L		100	90 - 110	0	10

**Lab Sample ID: MRL 280-353988/3**  
**Matrix: Water**  
**Analysis Batch: 353988**

**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	2.57	J	mg/L		103	50 - 150
Fluoride	0.200	0.169	J	mg/L		85	50 - 150
Sulfate	2.50	2.56	J	mg/L		103	50 - 150

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

**Lab Sample ID: MB 280-351020/1**  
**Matrix: Water**  
**Analysis Batch: 351020**

**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			11/11/16 10:13	1

**Lab Sample ID: LCS 280-351020/2**  
**Matrix: Water**  
**Analysis Batch: 351020**

**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	488		mg/L		98	86 - 110

**Lab Sample ID: MB 280-351303/1**  
**Matrix: Water**  
**Analysis Batch: 351303**

**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			11/14/16 10:35	1

**Lab Sample ID: LCS 280-351303/2**  
**Matrix: Water**  
**Analysis Batch: 351303**

**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

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: MB 280-350887/2**  
**Matrix: Water**  
**Analysis Batch: 350887**

**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			11/10/16 16:34	1

**Lab Sample ID: LCS 280-350887/1**  
**Matrix: Water**  
**Analysis Batch: 350887**

**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	92.0		mg/L		92	86 - 114

**Lab Sample ID: 280-90696-1 DU**  
**Matrix: Ground Water**  
**Analysis Batch: 350887**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	29		28.4		mg/L		1	10

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

**Lab Sample ID: MB 160-278905/1-A**  
**Matrix: Water**  
**Analysis Batch: 283776**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 278905**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.07214	U	0.200	0.200	1.00	0.376	pCi/L	11/11/16 13:24	12/13/16 20:09	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110	11/11/16 13:24	12/13/16 20:09	1

**Lab Sample ID: LCS 160-278905/2-A**  
**Matrix: Water**  
**Analysis Batch: 283776**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 278905**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.1	14.57		1.83	1.00	0.420	pCi/L	131	68 - 137

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	86.0		40 - 110



# QC Sample Results

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

TestAmerica Job ID: 280-90696-1

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

**Lab Sample ID: MB 160-278918/1-A**  
**Matrix: Water**  
**Analysis Batch: 283776**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 278918**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3536	U	0.253	0.256	1.00	0.395	pCi/L	11/11/16 14:15	12/13/16 13:54	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	88.0		40 - 110	11/11/16 14:15	12/13/16 13:54	1
Y Carrier	87.5		40 - 110	11/11/16 14:15	12/13/16 13:54	1

**Lab Sample ID: LCS 160-278918/2-A**  
**Matrix: Water**  
**Analysis Batch: 283775**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 278918**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	14.1	16.55		1.76	1.00	0.416	pCi/L	117	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	86.0		40 - 110
Y Carrier	90.5		40 - 110

# QC Association Summary

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

TestAmerica Job ID: 280-90696-1

## Metals

### Prep Batch: 255364

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-2	MW-9	Total Recoverable	Ground Water	3005A	
280-90696-4	MW-13D	Total Recoverable	Ground Water	3005A	
280-90696-5	MW-9EB	Total Recoverable	Water	3005A	
280-90696-6	MW-13	Total Recoverable	Ground Water	3005A	
MB 240-255364/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-255364/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-255364/3-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	3005A	

### Prep Batch: 255444

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-3	MW-10	Total Recoverable	Ground Water	3005A	
MB 240-255444/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-255444/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-255444/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 255599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total Recoverable	Ground Water	6010C	255364
280-90696-2	MW-9	Total Recoverable	Ground Water	6010C	255364
280-90696-3	MW-10	Total Recoverable	Ground Water	6010C	255444
280-90696-4	MW-13D	Total Recoverable	Ground Water	6010C	255364
280-90696-5	MW-9EB	Total Recoverable	Water	6010C	255364
280-90696-6	MW-13	Total Recoverable	Ground Water	6010C	255364
MB 240-255364/1-A	Method Blank	Total Recoverable	Water	6010C	255364
MB 240-255444/1-A	Method Blank	Total Recoverable	Water	6010C	255444
LCS 240-255364/2-A	Lab Control Sample	Total Recoverable	Water	6010C	255364
LCS 240-255444/2-A	Lab Control Sample	Total Recoverable	Water	6010C	255444
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	6010C	255364
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	6010C	255364

### Analysis Batch: 256468

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-3	MW-10	Total Recoverable	Ground Water	6020A	255444
MB 240-255444/1-A	Method Blank	Total Recoverable	Water	6020A	255444
LCS 240-255444/3-A	Lab Control Sample	Total Recoverable	Water	6020A	255444

### Analysis Batch: 258041

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total Recoverable	Ground Water	6020A	255364
280-90696-2	MW-9	Total Recoverable	Ground Water	6020A	255364
280-90696-4	MW-13D	Total Recoverable	Ground Water	6020A	255364
280-90696-5	MW-9EB	Total Recoverable	Water	6020A	255364
280-90696-6	MW-13	Total Recoverable	Ground Water	6020A	255364
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	6020A	255364
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	6020A	255364

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-90696-1

## Metals (Continued)

### Prep Batch: 258623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-4	MW-13D	Total Recoverable	Ground Water	3005A	
MB 240-258623/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-258623/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	3005A	
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	3005A	

### Analysis Batch: 258864

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total Recoverable	Ground Water	6020A	258623
280-90696-4	MW-13D	Total Recoverable	Ground Water	6020A	258623
280-90696-6	MW-13	Total Recoverable	Ground Water	6020A	255364
MB 240-255364/1-A	Method Blank	Total Recoverable	Water	6020A	255364
MB 240-258623/1-A	Method Blank	Total Recoverable	Water	6020A	258623
LCS 240-255364/3-A	Lab Control Sample	Total Recoverable	Water	6020A	255364
LCS 240-258623/2-A	Lab Control Sample	Total Recoverable	Water	6020A	258623
280-90696-1 MS	MW-8	Total Recoverable	Ground Water	6020A	258623
280-90696-1 MSD	MW-8	Total Recoverable	Ground Water	6020A	258623

### Analysis Batch: 259217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-2	MW-9	Total Recoverable	Ground Water	6020A	255364
280-90696-5	MW-9EB	Total Recoverable	Water	6020A	255364

### Prep Batch: 352593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	7470A	
280-90696-2	MW-9	Total/NA	Ground Water	7470A	
280-90696-3	MW-10	Total/NA	Ground Water	7470A	
280-90696-4	MW-13D	Total/NA	Ground Water	7470A	
280-90696-5	MW-9EB	Total/NA	Water	7470A	
280-90696-6	MW-13	Total/NA	Ground Water	7470A	
MB 280-352593/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-352593/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-90696-1 MS	MW-8	Total/NA	Ground Water	7470A	
280-90696-1 MSD	MW-8	Total/NA	Ground Water	7470A	

### Analysis Batch: 352806

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	7470A	352593
280-90696-2	MW-9	Total/NA	Ground Water	7470A	352593
280-90696-3	MW-10	Total/NA	Ground Water	7470A	352593
280-90696-4	MW-13D	Total/NA	Ground Water	7470A	352593
280-90696-5	MW-9EB	Total/NA	Water	7470A	352593
280-90696-6	MW-13	Total/NA	Ground Water	7470A	352593
MB 280-352593/1-A	Method Blank	Total/NA	Water	7470A	352593
LCS 280-352593/2-A	Lab Control Sample	Total/NA	Water	7470A	352593
280-90696-1 MS	MW-8	Total/NA	Ground Water	7470A	352593
280-90696-1 MSD	MW-8	Total/NA	Ground Water	7470A	352593

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-90696-1

## General Chemistry

### Analysis Batch: 350887

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	SM 2540D	
280-90696-2	MW-9	Total/NA	Ground Water	SM 2540D	
280-90696-3	MW-10	Total/NA	Ground Water	SM 2540D	
280-90696-4	MW-13D	Total/NA	Ground Water	SM 2540D	
280-90696-5	MW-9EB	Total/NA	Water	SM 2540D	
280-90696-6	MW-13	Total/NA	Ground Water	SM 2540D	
MB 280-350887/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-350887/1	Lab Control Sample	Total/NA	Water	SM 2540D	
280-90696-1 DU	MW-8	Total/NA	Ground Water	SM 2540D	

### Analysis Batch: 351020

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-2	MW-9	Total/NA	Ground Water	SM 2540C	
280-90696-3	MW-10	Total/NA	Ground Water	SM 2540C	
280-90696-4	MW-13D	Total/NA	Ground Water	SM 2540C	
280-90696-6	MW-13	Total/NA	Ground Water	SM 2540C	
MB 280-351020/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-351020/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 351303

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	SM 2540C	
280-90696-5	MW-9EB	Total/NA	Water	SM 2540C	
MB 280-351303/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-351303/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 351913

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	9040B	
280-90696-2	MW-9	Total/NA	Ground Water	9040B	
280-90696-3	MW-10	Total/NA	Ground Water	9040B	
280-90696-4	MW-13D	Total/NA	Ground Water	9040B	
280-90696-6	MW-13	Total/NA	Ground Water	9040B	
LCS 280-351913/29	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 352485

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-5	MW-9EB	Total/NA	Water	9040B	
LCS 280-352485/4	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 353988

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	9056A	
280-90696-1	MW-8	Total/NA	Ground Water	9056A	
280-90696-2	MW-9	Total/NA	Ground Water	9056A	
280-90696-2	MW-9	Total/NA	Ground Water	9056A	
280-90696-3	MW-10	Total/NA	Ground Water	9056A	
280-90696-3	MW-10	Total/NA	Ground Water	9056A	
280-90696-4	MW-13D	Total/NA	Ground Water	9056A	
280-90696-4	MW-13D	Total/NA	Ground Water	9056A	
280-90696-5	MW-9EB	Total/NA	Water	9056A	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-90696-1

## General Chemistry (Continued)

### Analysis Batch: 353988 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-6	MW-13	Total/NA	Ground Water	9056A	
280-90696-6	MW-13	Total/NA	Ground Water	9056A	
MB 280-353988/6	Method Blank	Total/NA	Water	9056A	
LCS 280-353988/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-353988/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-353988/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 278905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	PrecSep-21	
280-90696-2	MW-9	Total/NA	Ground Water	PrecSep-21	
280-90696-3	MW-10	Total/NA	Ground Water	PrecSep-21	
280-90696-4	MW-13D	Total/NA	Ground Water	PrecSep-21	
280-90696-5	MW-9EB	Total/NA	Water	PrecSep-21	
280-90696-6	MW-13	Total/NA	Ground Water	PrecSep-21	
MB 160-278905/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-278905/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 278918

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-90696-1	MW-8	Total/NA	Ground Water	PrecSep_0	
280-90696-2	MW-9	Total/NA	Ground Water	PrecSep_0	
280-90696-3	MW-10	Total/NA	Ground Water	PrecSep_0	
280-90696-4	MW-13D	Total/NA	Ground Water	PrecSep_0	
280-90696-5	MW-9EB	Total/NA	Water	PrecSep_0	
280-90696-6	MW-13	Total/NA	Ground Water	PrecSep_0	
MB 160-278918/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-278918/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

# Lab Chronicle

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

TestAmerica Job ID: 280-90696-1

**Client Sample ID: MW-8**  
**Date Collected: 11/08/16 12:15**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-1**  
**Matrix: Ground 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	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 18:35	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258041	12/02/16 18:30	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	258623	12/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258864	12/09/16 10:58	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:02	CDH	TAL DEN
Total/NA	Analysis	9040B		1			351913	11/16/16 15:51	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 16:09	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	353988	12/02/16 23:28	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	351303	11/14/16 10:35	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.70 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1			283771	12/13/16 20:04	MLK	TAL SL
Total/NA	Prep	PrecSep_0			999.70 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1			283775	12/13/16 13:49	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

**Client Sample ID: MW-9**  
**Date Collected: 11/07/16 16:40**  
**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-2**  
**Matrix: Ground 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	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 19:13	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258041	12/02/16 18:58	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		5			259217	12/12/16 15:05	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:09	CDH	TAL DEN
Total/NA	Analysis	9040B		1			351913	11/16/16 15:56	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 16:27	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	353988	12/02/16 23:46	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	351020	11/11/16 10:13	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.76 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1			283771	12/13/16 20:04	MLK	TAL SL
Total/NA	Prep	PrecSep_0			999.76 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1			283775	12/13/16 13:49	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-90696-1

**Client Sample ID: MW-10**

**Date Collected: 11/07/16 15:15**

**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-3**

**Matrix: Ground 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	255444	11/12/16 15:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 18:22	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255444	11/12/16 15:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			256468	11/19/16 21:28	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:11	CDH	TAL DEN
Total/NA	Analysis	9040B		1			351913	11/16/16 15:59	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 16:45	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	353988	12/03/16 00:03	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	351020	11/11/16 10:13	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.69 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1			283771	12/13/16 20:04	MLK	TAL SL
Total/NA	Prep	PrecSep_0			999.69 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1			283775	12/13/16 13:49	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

**Client Sample ID: MW-13D**

**Date Collected: 11/07/16 12:00**

**Date Received: 11/08/16 17:15**

**Lab Sample ID: 280-90696-4**

**Matrix: Ground 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	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 19:18	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258041	12/02/16 19:11	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	258623	12/08/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258864	12/09/16 11:35	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:13	CDH	TAL DEN
Total/NA	Analysis	9040B		1			351913	11/16/16 16:04	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 17:02	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	353988	12/03/16 00:21	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	351020	11/11/16 10:13	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.62 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1			283771	12/13/16 20:05	MLK	TAL SL
Total/NA	Prep	PrecSep_0			1000.62 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1			283775	12/13/16 13:50	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

TestAmerica Denver



# Lab Chronicle

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

TestAmerica Job ID: 280-90696-1

**Client Sample ID: MW-9EB**

**Lab Sample ID: 280-90696-5**

**Date Collected: 11/08/16 10:30**

**Matrix: Water**

**Date Received: 11/08/16 17:15**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 19:22	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258041	12/02/16 19:15	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		5			259217	12/12/16 15:09	RKT	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:20	CDH	TAL DEN
Total/NA	Analysis	9040B		1			352485	11/21/16 10:54	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 15:15	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	351303	11/14/16 10:35	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.16 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1			283771	12/13/16 20:05	MLK	TAL SL
Total/NA	Prep	PrecSep_0			999.16 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1			283775	12/13/16 13:50	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

**Client Sample ID: MW-13**

**Lab Sample ID: 280-90696-6**

**Date Collected: 11/07/16 11:45**

**Matrix: Ground Water**

**Date Received: 11/08/16 17:15**

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			255599	11/14/16 19:26	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258041	12/02/16 19:19	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	255364	11/11/16 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			258864	12/09/16 12:17	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	352593	11/22/16 11:20	CDH	TAL DEN
Total/NA	Analysis	7470A		1			352806	11/22/16 18:22	CDH	TAL DEN
Total/NA	Analysis	9040B		1			351913	11/16/16 16:15	MMC	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	353988	12/02/16 17:20	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	353988	12/03/16 00:39	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	351020	11/11/16 10:13	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	350887	11/10/16 16:34	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.48 mL	1.0 g	278905	11/11/16 13:24	AS	TAL SL
Total/NA	Analysis	9315		1	1.0 mL	1.0 mL	283775	12/13/16 20:06	MLK	TAL SL
Total/NA	Prep	PrecSep_0			1000.48 mL	1.0 g	278918	11/11/16 14:15	AS	TAL SL
Total/NA	Analysis	9320		1	1.0 mL	1.0 mL	283775	12/13/16 13:50	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			284139	12/15/16 15:01	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

Client: HDR Inc

Project/Site: Xcel Energy GW CCR Monitoring - Cherokee

TestAmerica Job ID: 280-90696-1

## 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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# Certification Summary

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

TestAmerica Job ID: 280-90696-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP	10	4025	01-09-17
The following analytes are included in this report, but are not certified under this certification:				
Analysis Method	Prep Method	Matrix	Analyte	
9040B		Ground Water	Temperature	
9040B		Water	Temperature	

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	NELAP	9	01144CA	06-30-14 *
California	State Program	9	2927	04-30-17
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17
Illinois	NELAP	5	200004	07-31-17
Kansas	NELAP	7	E-10336	01-31-17 *
Kentucky (UST)	State Program	4	58	02-23-17
Kentucky (WW)	State Program	4	98016	12-31-16 *
Minnesota	NELAP	5	039-999-348	12-31-16 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17
Nevada	State Program	9	OH-000482008A	07-31-17
New Jersey	NELAP	2	OH001	06-30-17
New York	NELAP	2	10975	03-31-17
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-17
Pennsylvania	NELAP	3	68-00340	08-31-17
Texas	NELAP	6	T104704517-15-5	08-31-17
USDA	Federal		P330-13-00319	11-26-16 *
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-17
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-17
California	State Program	9	2886	03-31-18
Connecticut	State Program	1	PH-0241	03-31-17
Florida	NELAP	4	E87689	06-30-17
Illinois	NELAP	5	003757	11-30-16 *
Iowa	State Program	7	373	12-01-16 *
Kansas	NELAP	7	E-10236	10-31-17
Kentucky (DW)	State Program	4	90125	12-31-16
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-17
Louisiana (DW)	NELAP	6	LA160008	12-31-16 *
Maryland	State Program	3	310	09-30-17
Missouri	State Program	7	780	06-30-17

\* Certification renewal pending - certification considered valid.

# Certification Summary

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

TestAmerica Job ID: 280-90696-1

## Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Nevada	State Program	9	MO000542016-1	07-31-17
New Jersey	NELAP	2	MO002	06-30-17
New York	NELAP	2	11616	03-31-17
North Dakota	State Program	8	R207	06-30-17
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-17
Pennsylvania	NELAP	3	68-00540	02-28-17 *
South Carolina	State Program	4	85002001	06-30-17
Texas	NELAP	6	T104704193-16-10	07-31-17
US Fish & Wildlife	Federal		LE058448-0	10-31-17
USDA	Federal		P330-14-0016	01-09-17
Utah	NELAP	8	MO000542016-8	07-31-17
Virginia	NELAP	3	460230	06-14-17
Washington	State Program	10	C592	08-30-17
West Virginia DEP	State Program	3	381	08-31-17

\* Certification renewal pending - certification considered valid.

TestAmerica Denver

# Chain of Custody Record

<b>Client Information</b> Anna Lundin HDR, Inc Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State, Zip: CO, 80112 Phone: 720-633-2380(Tel) Email: anna.lundin@hdrinc.com Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		Sampler: Nick Hancock Phone: (303) 351-2139 Lab PM: Stephanie K Rothmeyer E-Mail: stephanie.rothmeyer@testamericainc.com		Carrier Tracking No(s): Page 1 of 1 Job #		COC No: 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:	
<b>Due Date Requested:</b> TAT Requested (days): Standard PO #: DEN-001 WO #: Project #: 28014371 SSO#:		<b>Analysis Requested</b> Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) Metals - 6020A, 7470A PH - 9040B, Anions - 9056A_28D 2540D - Total Suspended Solids 9315_Ra226, 9320_Ra228		Total Number of Containers Special Instructions/Note: Did not sample		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - ph 4-5 Z - other (specify)	
<b>Sample Identification</b> MMW-7 MMW-8 MMW-9 MMW-10 Field Duplicate Equipment Blank MW-13		Sample Date Sample Time Sample Type (C=comp, G=grab) Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air) Preservation Code		N D N D 1 2 2 1 2 1 2 2 1 2 1 2 2 1 2 1 2 2 1 2 1 2 2 1 2 1 2 2 1 2 1 2 2 1 2		8 8 8 8 8 8 8	
<b>Possible Hazard Identification</b> <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		280-90696 Chain of Custody Return To Client Disposal By Lab Archive For Months		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Date:		Method of Shipment:		Relinquished by: Nick Hancock Date/Time: 11/8/16 1715 Company: HDR	
Relinquished by:		Date/Time:		Method of Shipment:		Relinquished by:	
Relinquished by:		Date/Time:		Method of Shipment:		Relinquished by:	
Relinquished by:		Date/Time:		Method of Shipment:		Relinquished by:	
Custody Seals Intact Δ Yes Δ No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 1.6, 6.7, 0.3 TRH50.0 Transfeco RP 11-8-16		Company:	





# Chain of Custody Record

<b>Client Information</b> Anna Lundin HDR Inc Address: 9781 S. Meridian Blvd Suite 400 City: Englewood State, Zip: CO, 80112 Phone: 720-633-2380(Tel) Email: anna.lundin@hdrinc.com Project Name: Xcel Energy GW CCR Monitoring - Cherokee Site: Colorado		Sampler: Nick Hancock Phone: (303) 351-2139 Lab PM: Rothmeyer, Stephanie K E-Mail: stephanie.rothmeyer@testamericainc.com		Carrier Tracking No(s): Page 1 of 1 Job #		COC No: 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:	
<b>Due Date Requested:</b> TAT Requested (days): Standard PO #: DEN-001 WO #: Project #: 28014371 SSO#W#:		<b>Analysis Requested</b> 2540C - Total Dissolved Solids (TDS) Metals - 6020A, 7470A PH - 9040B, Anions - 9056A_28D 2540D - Total Suspended Solids 9315_Ra226, 9320_Ra228		Total Number of Containers 8 8 8 8 8 8 8		Special Instructions/Note: Did not sample	
<b>Sample Identification</b> MMW-7 MMW-8 MMW-9 MMW-10 Field Duplicate Equipment Blank MW-13		Sample Date 11/08/16 11/07/16 11/07/16 11/07/16 11/08/16 11/07/16		Sample Time 1215 1640 1515 1200 1030 1145		Matrix (W=water, S=solid, O=wasteoil, BT=Tissue, A=Air) Water Water Water Water Water Water Water	
<b>Possible Hazard Identification</b> <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Deliverable Requested: I, II, III, IV, Other (specify)		280-90696 Chain of Custody Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For <input type="checkbox"/> Months		Special Instructions/QC Requirements:	
Empty Kit Relinquished by:		Date:		Method of Shipment:		Relinquished by: Nick Hancock Date/Time: 11/8/16 1715 Company: HDR Relinquished by: Date/Time: Company: Relinquished by: Date/Time: Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: 11.6, 6.7, 0.3, 22.4, 5.0, 2 Transf. Rec. 11-8-16		Relinquished by: Date/Time: Company:	



**TestAmerica Denver**

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

**Chain of Custody Record**



LEADER IN ENVIRONMENTAL TESTING

Client Information (Sub Contract Lab)  
 Company: TestAmerica Laboratories, Inc.  
 Address: 13715 Rider Trail North, Earth City, MO, 63045  
 Phone: 314-298-8566(Tel) 314-298-8757(Fax)  
 Email: [Redacted]

Client Information (Sub Contract Lab)  
 Lab PM: Rothmeyer, Stephanie K  
 E-Mail: stephanie.rothmeyer@testamericainc.com  
 Address: 280-90696 Chain of Custody, Colorado  
 Job #: 280-90696-1

Due Date Requested: 12/8/2016  
 TAT Requested (days):  
 Project #: 28014371  
 SOW#: [Redacted]

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=BIOTISSUE, AS=ALK)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPCL (MOD) Local Method	9315_Ra226/PreSep_21 Radium-226 - 1/3 - SUB	9320_Ra226/PreSep_0 Radium-228 - 2/3 - SUB	Analysis Requested	Preservation Codes	Total Number of Containers	Special Instructions/Note:
MW-8 (280-90696-1)	11/8/16	12:15 Mountain	Water	Water	X	X	X	X	X		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Ice V - MCAA W - pH 4-5 L - EDTA Z - other (Specify)	2	
MW-9 (280-90696-2)	11/7/16	16:40 Mountain	Water	Water	X	X	X	X	X			2	
MW-10 (280-90696-3)	11/7/16	15:15 Mountain	Water	Water	X	X	X	X	X			2	
FIELD DUPLICATE (280-90696-4)	11/7/16	12:00 Mountain	Water	Water	X	X	X	X	X			2	
EQUIPMENT BLANK (280-90696-5)	11/8/16	10:30 Mountain	Water	Water	X	X	X	X	X			2	
MW-13 (280-90696-6)	11/7/16	11:45 Mountain	Water	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 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: [Redacted] Date: [Redacted]  
 Relinquished by: [Redacted] Date/Time: 11-9-16 16:25 Company: TAD  
 Relinquished by: [Redacted] Date/Time: [Redacted] Company: [Redacted]  
 Relinquished by: [Redacted] Date/Time: [Redacted] Company: [Redacted]  
 Custody Seals Intact: [Redacted] Custody Seal No.: [Redacted]  
 Cooler Temperature(s) °C and Other Remarks:





**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Rothmeyer, Stephanie K		Carrier Tracking No(s):					
Client Contact: Shipping/Receiving		E-Mail: stephanie.rothmeyer@testamericainc.com		State of Origin: Colorado					
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		COC No: 280-376813.1					
Address: 4101 Shuffel Street NW		Due Date Requested: 12/15/2016		Page: Page 1 of 1					
City: North Canton		TAT Requested (days):		Job #: 280-90696-1					
State, Zip: OH, 44720		PO #:		Preservation Codes:					
Phone: 330-497-9396(Tel) 330-497-0772(Fax)		WO #:		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 - AshNaO2 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 (Water, Solid, D-waste, Other)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	6020A/3005A 14 Metals (Includes B and Ca) - 1/2-SUB	Special Instructions/Note:	
MW-8 (280-90696-1)	11/8/16	12:15 Mountain	Water	Water	X	X		Use Collision Cell	
MW-9 (280-90696-2)	11/7/16	16:40 Mountain	Water	Water	X	X		Use Collision Cell	
MW-10 (280-90696-3)	11/7/16	15:15 Mountain	Water	Water	X	X		Use Collision Cell	
FIELD DUPLICATE (280-90696-4)	11/7/16	12:00 Mountain	Water	Water	X	X		Use Collision Cell	
EQUIPMENT BLANK (280-90696-5)	11/8/16	10:30 Mountain	Water	Water	X	X		Use Collision Cell	
MW-13 (280-90696-6)	11/7/16	11:45 Mountain	Water	Water	X	X		Use Collision Cell	
<p>Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte &amp; accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/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.</p>									
<p><b>Possible Hazard Identification</b></p> <p>Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 4</p> <p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)  <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months</p>									
<p>Empty Kit Relinquished by: _____ Date: _____ Method of Shipment: _____</p>									
Relinquished by: <i>SE</i>		Date/Time: 11-9-16 1530		Company: TAB		Date/Time: 11/10/16 915		Company: JAC	
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Date/Time:		Company:	
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks:					



**TestAmerica Canton Sample Receipt Form/Narrative** Login # : \_\_\_\_\_

**Canton Facility**

Client TA Denver Site Name \_\_\_\_\_ Cooler unpacked by: DSO

Cooler Received on 11/10/16 Opened on 11/10/16

FedEx: 1<sup>st</sup> Grd  UPS FAS Stetson 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

- Cooler temperature upon receipt  
 IR GUN# IR-8 (CF +0.4 °C) Observed Cooler Temp. 1.4 °C Corrected Cooler Temp. 1.8 °C  
 IR GUN #36 (CF +1.3°C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C
- Were custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No  
 -Were custody seals on the outside of the cooler(s) signed & dated? Yes No NA  
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes  No
- Shippers' packing slip attached to the cooler(s)? Yes No
- Did custody papers accompany the sample(s)? Yes No
- Were the custody papers relinquished & signed in the appropriate place? Yes No
- Was/were the person(s) who collected the samples clearly identified on the COC? Yes  No
- Did all bottles arrive in good condition (Unbroken)? Yes No
- Could all bottle labels be reconciled with the COC? Yes No
- Were correct bottle(s) used for the test(s) indicated? Yes No
- Sufficient quantity received to perform indicated analyses? Yes No
- Are these work share samples? Yes No
- If yes, Questions 11-15 have been checked at the originating laboratory.
- Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC682547
- Were VOAs on the COC? Yes No
- Were air bubbles >6 mm in any VOA vials? Yes No NA
- Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_ Yes No
- 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): \_\_\_\_\_

Ref: SOP NC-SC-0005, Sample Receiving  
 L:\QAQC\QA Department\QA TARDIS\Document Control\Work Instructions\Un Revision\WI-NC-099-101216 Cooler Receipt Form.doc djf

## Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-90696-1

**Login Number: 90696**

**List Number: 1**

**Creator: Pottruff, Reed W**

**List Source: TestAmerica Denver**

Question	Answer	Comment
Radioactivity wasn't checked or is <math>\leq</math> background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (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: 280-90696-1

**Login Number: 90696**  
**List Number: 3**  
**Creator: Daniels, Brian J**

**List Source: TestAmerica St. Louis**  
**List Creation: 11/10/16 04:11 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	
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 <6mm (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: 280-90696-1

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
280-90696-1	MW-8	84.0	
280-90696-2	MW-9	82.6	
280-90696-3	MW-10	77.2	
280-90696-4	MW-13D	79.5	
280-90696-6	MW-13	80.1	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	
280-90696-5	MW-9EB	84.0	
LCS 160-278905/2-A	Lab Control Sample	86.0	
MB 160-278905/1-A	Method Blank	88.0	
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			

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

Matrix: Ground Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-90696-1	MW-8	84.0	87.9
280-90696-2	MW-9	82.6	89.0
280-90696-3	MW-10	77.2	86.7
280-90696-4	MW-13D	79.5	87.9
280-90696-6	MW-13	80.1	88.6
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

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

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-90696-5	MW-9EB	84.0	91.2
LCS 160-278918/2-A	Lab Control Sample	86.0	90.5
MB 160-278918/1-A	Method Blank	88.0	87.5
<b>Tracer/Carrier Legend</b>			
Ba = Ba Carrier			
Y = Y Carrier			

TestAmerica Denver

# 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: 280-94335-1

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:

3/28/2017 4:55:09 PM

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### 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: 280-94335-1

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

### Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

## Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains no Free Liquid
DER	Duplicate error ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision level concentration
MDA	Minimum detectable activity
EDL	Estimated Detection Limit
MDC	Minimum detectable concentration
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
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: 280-94335-1

**Job ID: 280-94335-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-94335-1**

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 3/1/2017 at 3:50 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 5.3° C and 5.9° C.

The Chain-of-Custody (COC) was improperly completed. The Empty Kit Relinquished by: field on the COC was filled out at the time of sample receipt instead of the Relinquished By: field.

### **TOTAL RECOVERABLE METALS**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 03/06/2017 and analyzed on 03/07/2017.

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

### **TOTAL RECOVERABLE METALS (ICPMS)**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 03/06/2017 and analyzed on 03/07/2017.

Barium and Calcium were detected in method blank MB 240-269333/1-A 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.

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

### **TOTAL MERCURY**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/21/2017.

# Case Narrative

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

TestAmerica Job ID: 280-94335-1

## Job ID: 280-94335-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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

#### **TOTAL DISSOLVED SOLIDS**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 03/02/2017.

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

#### **TOTAL SUSPENDED SOLIDS**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 03/06/2017.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample MW-8 (280-94335-1). Sample non-homogeneity is suspected.

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

#### **CORROSIVITY (PH)**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 03/03/2017 and 03/08/2017.

The following sample did not equilibrate: MW-9EB (280-94335-6). A rerun is reported, since the original run did not equilibrate.

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

#### **ANIONS (28 DAYS)**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 03/02/2017 and 03/03/2017.

Samples MW-8 (280-94335-1)[20X], MW-9 (280-94335-2)[20X], MW-10 (280-94335-3)[20X], MW-13 (280-94335-4)[5X] and MW10-D (280-94335-5)[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-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 03/06/2017 and analyzed on 03/28/2017.

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

#### **RADIUM-228**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB (280-94335-6) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 03/06/2017 and analyzed on 03/20/2017.

Radium-228 was detected in method blank MB 160-296161/1-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.

#### **RADIUM-226/RADIUM-228 (GFPC)**

Samples MW-8 (280-94335-1), MW-9 (280-94335-2), MW-10 (280-94335-3), MW-13 (280-94335-4), MW10-D (280-94335-5) and MW-9EB

# Case Narrative

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

TestAmerica Job ID: 280-94335-1

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## Job ID: 280-94335-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

(280-94335-6) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 03/28/2017.

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

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# Detection Summary

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

TestAmerica Job ID: 280-94335-1

## Client Sample ID: MW-8

## Lab Sample ID: 280-94335-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.5		0.20	0.0081	mg/L	1		6010C	Total
Antimony	0.0016	J	0.0020	0.00027	mg/L	1		6020A	Recoverable Total
Arsenic	0.0016	J	0.0050	0.00035	mg/L	1		6020A	Recoverable Total
Barium	0.034	B	0.0050	0.00052	mg/L	1		6020A	Recoverable Total
Cadmium	0.0032		0.0010	0.00031	mg/L	1		6020A	Recoverable Total
Calcium	380	B	1.0	0.043	mg/L	1		6020A	Recoverable Total
Chromium	0.00090	J	0.0020	0.00026	mg/L	1		6020A	Recoverable Total
Cobalt	0.0065		0.0010	0.00013	mg/L	1		6020A	Recoverable Total
Lead	0.00079	J	0.0010	0.00016	mg/L	1		6020A	Recoverable Total
Lithium	0.11		0.0080	0.00016	mg/L	1		6020A	Recoverable Total
Molybdenum	0.049		0.010	0.00051	mg/L	1		6020A	Recoverable Total
Selenium	0.0091		0.0050	0.00048	mg/L	1		6020A	Recoverable Total
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	570		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	1.1		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1200		100	4.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2800		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-9

## Lab Sample ID: 280-94335-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.3		0.20	0.0081	mg/L	1		6010C	Total
Antimony	0.0022		0.0020	0.00027	mg/L	1		6020A	Recoverable Total
Arsenic	0.0034	J	0.0050	0.00035	mg/L	1		6020A	Recoverable Total
Barium	0.057	B	0.0050	0.00052	mg/L	1		6020A	Recoverable Total
Cadmium	0.0047		0.0010	0.00031	mg/L	1		6020A	Recoverable Total
Calcium	400	B	1.0	0.043	mg/L	1		6020A	Recoverable Total
Chromium	0.00098	J	0.0020	0.00026	mg/L	1		6020A	Recoverable Total
Cobalt	0.0037		0.0010	0.00013	mg/L	1		6020A	Recoverable Total
Lead	0.0037		0.0010	0.00016	mg/L	1		6020A	Recoverable Total
Lithium	0.15		0.0080	0.00016	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: 280-94335-1

## Client Sample ID: MW-9 (Continued)

## Lab Sample ID: 280-94335-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.053		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0049	J	0.0050	0.00048	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	23.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	800		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	2.3		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)	3300		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1.2	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 280-94335-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.1		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Antimony	0.0024		0.0020	0.00027	mg/L	1		6020A	Total Recoverable
Arsenic	0.0030	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.074	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Cadmium	0.00093	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	380	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00096	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.0036		0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.00060	J	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.12		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.053		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0049	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.5	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	660		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	2.9		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)	3000		20	9.4	mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-94335-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.73		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Arsenic	0.00062	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.10	B	0.0050	0.00052	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: 280-94335-1

## Client Sample ID: MW-13 (Continued)

## Lab Sample ID: 280-94335-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	160	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.0017	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.00025	J	0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.00026	J	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.043		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0027	J	0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0045	J	0.0050	0.00048	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	23.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	190		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	250		25	1.2	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	17		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW10-D

## Lab Sample ID: 280-94335-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.1		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Antimony	0.0023		0.0020	0.00027	mg/L	1		6020A	Total Recoverable
Arsenic	0.0029	J	0.0050	0.00035	mg/L	1		6020A	Total Recoverable
Barium	0.074	B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Cadmium	0.00086	J	0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Calcium	380	B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.0010	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Cobalt	0.0036		0.0010	0.00013	mg/L	1		6020A	Total Recoverable
Lead	0.00042	J	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.00016	mg/L	1		6020A	Total Recoverable
Molybdenum	0.053		0.010	0.00051	mg/L	1		6020A	Total Recoverable
Selenium	0.0044	J	0.0050	0.00048	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	23.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	660		60	5.1	mg/L	20		9056A	Total/NA
Fluoride	2.9		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)	3000		20	9.4	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: 280-94335-1

## Client Sample ID: MW10-D (Continued)

## Lab Sample ID: 280-94335-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Suspended Solids	2.0	J	4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-9EB

## Lab Sample ID: 280-94335-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.010	J	0.20	0.0081	mg/L	1		6010C	Total Recoverable
Barium	0.0011	J B	0.0050	0.00052	mg/L	1		6020A	Total Recoverable
Calcium	0.26	J B	1.0	0.043	mg/L	1		6020A	Total Recoverable
Chromium	0.00082	J	0.0020	0.00026	mg/L	1		6020A	Total Recoverable
Lead	0.00027	J	0.0010	0.00016	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	6.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.3	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Sulfate	0.43	J	5.0	0.23	mg/L	1		9056A	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: 280-94335-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-94335-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-94335-1	MW-8	Water	02/27/17 14:10	03/01/17 15:50
280-94335-2	MW-9	Water	02/27/17 12:55	03/01/17 15:50
280-94335-3	MW-10	Water	02/27/17 11:20	03/01/17 15:50
280-94335-4	MW-13	Water	03/01/17 09:45	03/01/17 15:50
280-94335-5	MW10-D	Water	02/27/17 11:20	03/01/17 15:50
280-94335-6	MW-9EB	Water	02/27/17 13:20	03/01/17 15:50

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# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.5		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 15:44	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.3		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 15:57	1

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 16:02	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.73		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 16:06	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.1		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 16:11	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.010	J	0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 16:15	1

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

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0016	J	0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 22:56	1
Arsenic	0.0016	J	0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 22:56	1
Barium	0.034	B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 22:56	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 22:56	1
Cadmium	0.0032		0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 22:56	1
Calcium	380	B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 22:56	1
Chromium	0.00090	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 22:56	1
Cobalt	0.0065		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 22:56	1
Lead	0.00079	J	0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 22:56	1
Lithium	0.11		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 22:56	1
Molybdenum	0.049		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 22:56	1
Selenium	0.0091		0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 22:56	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 22:56	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0022		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 23:00	1
Arsenic	0.0034	J	0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 23:00	1
Barium	0.057	B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 23:00	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 23:00	1
Cadmium	0.0047		0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 23:00	1
Calcium	400	B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 23:00	1
Chromium	0.00098	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 23:00	1
Cobalt	0.0037		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 23:00	1
Lead	0.0037		0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 23:00	1
Lithium	0.15		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 23:00	1
Molybdenum	0.053		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 23:00	1
Selenium	0.0049	J	0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 23:00	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 23:00	1

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0024		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 23:05	1
Arsenic	0.0030	J	0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 23:05	1
Barium	0.074	B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 23:05	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 23:05	1
Cadmium	0.00093	J	0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 23:05	1
Calcium	380	B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 23:05	1
Chromium	0.00096	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 23:05	1
Cobalt	0.0036		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 23:05	1
Lead	0.00060	J	0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 23:05	1
Lithium	0.12		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 23:05	1
Molybdenum	0.053		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 23:05	1
Selenium	0.0049	J	0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 23:05	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 23:05	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 23:09	1
Arsenic	0.00062	J	0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 23:09	1
Barium	0.10	B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 23:09	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 23:09	1
Cadmium	ND		0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 23:09	1
Calcium	160	B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 23:09	1
Chromium	0.0017	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 23:09	1
Cobalt	0.00025	J	0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 23:09	1
Lead	0.00026	J	0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 23:09	1
Lithium	0.043		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 23:09	1
Molybdenum	0.0027	J	0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 23:09	1
Selenium	0.0045	J	0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 23:09	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 23:09	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0023		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 23:13	1
Arsenic	0.0029	J	0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 23:13	1
Barium	0.074	B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 23:13	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 23:13	1
Cadmium	0.00086	J	0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 23:13	1
Calcium	380	B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 23:13	1
Chromium	0.0010	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 23:13	1
Cobalt	0.0036		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 23:13	1
Lead	0.00042	J	0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 23:13	1
Lithium	0.11		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 23:13	1
Molybdenum	0.053		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 23:13	1
Selenium	0.0044	J	0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 23:13	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 23:13	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 23:17	1
Arsenic	ND		0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 23:17	1
Barium	0.0011	J B	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 23:17	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 23:17	1
Cadmium	ND		0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 23:17	1
Calcium	0.26	J B	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 23:17	1
Chromium	0.00082	J	0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 23:17	1
Cobalt	ND		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 23:17	1
Lead	0.00027	J	0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 23:17	1
Lithium	ND		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 23:17	1
Molybdenum	ND		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 23:17	1
Selenium	ND		0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 23:17	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 23:17	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:21	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:27	1

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:29	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:32	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:34	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:36	1

## General Chemistry

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**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			03/03/17 13:35	1
Temperature	23.4	HF	1.0	1.0	Degrees C			03/03/17 13:35	1
Chloride	570		60	5.1	mg/L			03/02/17 23:42	20
Fluoride	1.1		0.50	0.060	mg/L			03/02/17 23:25	1
Sulfate	1200		100	4.6	mg/L			03/02/17 23:42	20
Total Dissolved Solids (TDS)	2800		20	9.4	mg/L			03/02/17 08:31	1
Total Suspended Solids	12		4.0	1.1	mg/L			03/06/17 18:04	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**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			03/03/17 13:40	1
Temperature	23.4	HF	1.0	1.0	Degrees C			03/03/17 13:40	1
Chloride	800		60	5.1	mg/L			03/03/17 00:15	20
Fluoride	2.3		0.50	0.060	mg/L			03/02/17 23:59	1
Sulfate	1300		100	4.6	mg/L			03/03/17 00:15	20
Total Dissolved Solids (TDS)	3300		20	9.4	mg/L			03/02/17 08:31	1
Total Suspended Solids	1.2	J	4.0	1.1	mg/L			03/06/17 18:04	1

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU			03/03/17 13:45	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

## General Chemistry (Continued)

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Temperature	23.5	HF	1.0	1.0	Degrees C			03/03/17 13:45	1
Chloride	660		60	5.1	mg/L			03/03/17 00:49	20
Fluoride	2.9		0.50	0.060	mg/L			03/03/17 00:32	1
Sulfate	1300		100	4.6	mg/L			03/03/17 00:49	20
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			03/02/17 08:31	1
Total Suspended Solids	ND		4.0	1.1	mg/L			03/06/17 18:04	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**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			03/03/17 13:50	1
Temperature	23.8	HF	1.0	1.0	Degrees C			03/03/17 13:50	1
Chloride	190		3.0	0.25	mg/L			03/03/17 01:06	1
Fluoride	1.2		0.50	0.060	mg/L			03/03/17 01:06	1
Sulfate	250		25	1.2	mg/L			03/03/17 01:23	5
Total Dissolved Solids (TDS)	1100		10	4.7	mg/L			03/02/17 08:31	1
Total Suspended Solids	17		4.0	1.1	mg/L			03/06/17 18:04	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**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			03/03/17 13:55	1
Temperature	23.8	HF	1.0	1.0	Degrees C			03/03/17 13:55	1
Chloride	660		60	5.1	mg/L			03/03/17 01:56	20
Fluoride	2.9		0.50	0.060	mg/L			03/03/17 01:40	1
Sulfate	1300		100	4.6	mg/L			03/03/17 01:56	20
Total Dissolved Solids (TDS)	3000		20	9.4	mg/L			03/02/17 08:31	1
Total Suspended Solids	2.0	J	4.0	1.1	mg/L			03/06/17 18:04	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	6.5	HF	0.1	0.1	SU			03/08/17 13:51	1
Temperature	24.3	HF	1.0	1.0	Degrees C			03/08/17 13:51	1
Chloride	ND		3.0	0.25	mg/L			03/03/17 02:47	1
Fluoride	ND		0.50	0.060	mg/L			03/03/17 02:47	1
Sulfate	0.43	J	5.0	0.23	mg/L			03/03/17 02:47	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			03/02/17 08:31	1
Total Suspended Solids	ND		4.0	1.1	mg/L			03/06/17 18:04	1

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.180		0.0979	0.0992	1.00	0.119	pCi/L	03/06/17 10:59	03/28/17 08:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					03/06/17 10:59	03/28/17 08:10	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.139		0.0889	0.0898	1.00	0.119	pCi/L	03/06/17 10:59	03/28/17 08:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					03/06/17 10:59	03/28/17 08:10	1

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.132		0.0855	0.0864	1.00	0.111	pCi/L	03/06/17 10:59	03/28/17 08:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					03/06/17 10:59	03/28/17 08:10	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.414		0.142	0.146	1.00	0.143	pCi/L	03/06/17 10:59	03/28/17 08:10	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.2		40 - 110					03/06/17 10:59	03/28/17 08:10	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0854	U	0.0764	0.0768	1.00	0.116	pCi/L	03/06/17 10:59	03/28/17 08:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					03/06/17 10:59	03/28/17 08:11	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.000	U	0.0496	0.0496	1.00	0.105	pCi/L	03/06/17 11:06	03/28/17 08:11	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.1		40 - 110					03/06/17 11:06	03/28/17 08:11	1

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

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.453		0.237	0.241	1.00	0.350	pCi/L	03/06/17 13:06	03/20/17 15:58	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	90.0		40 - 110					03/06/17 13:06	03/20/17 15:58	1
Y Carrier	92.0		40 - 110					03/06/17 13:06	03/20/17 15:58	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.484		0.237	0.241	1.00	0.346	pCi/L	03/06/17 13:06	03/20/17 15:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	94.7		40 - 110					03/06/17 13:06	03/20/17 15:59	1
Y Carrier	91.6		40 - 110					03/06/17 13:06	03/20/17 15:59	1

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.280	U	0.215	0.217	1.00	0.339	pCi/L	03/06/17 13:06	03/20/17 15:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	91.4		40 - 110					03/06/17 13:06	03/20/17 15:59	1
Y Carrier	93.5		40 - 110					03/06/17 13:06	03/20/17 15:59	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0968	U	0.232	0.232	1.00	0.399	pCi/L	03/06/17 13:06	03/20/17 15:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	83.2		40 - 110					03/06/17 13:06	03/20/17 15:59	1
Y Carrier	94.2		40 - 110					03/06/17 13:06	03/20/17 15:59	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.448		0.221	0.225	1.00	0.319	pCi/L	03/06/17 13:06	03/20/17 15:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	98.2		40 - 110					03/06/17 13:06	03/20/17 15:59	1
Y Carrier	86.7		40 - 110					03/06/17 13:06	03/20/17 15:59	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.231	U	0.173	0.174	1.00	0.360	pCi/L	03/06/17 13:06	03/20/17 15:59	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.1		40 - 110					03/06/17 13:06	03/20/17 15:59	1
Y Carrier	83.7		40 - 110					03/06/17 13:06	03/20/17 15:59	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.633		0.257	0.260	5.00	0.350	pCi/L		03/28/17 17:12	1

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.623		0.253	0.257	5.00	0.346	pCi/L		03/28/17 17:12	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-94335-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-10**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.412		0.232	0.233	5.00	0.339	pCi/L		03/28/17 17:12	1

**Client Sample ID: MW-13**  
**Date Collected: 03/01/17 09:45**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.511		0.272	0.274	5.00	0.399	pCi/L		03/28/17 17:12	1

**Client Sample ID: MW10-D**  
**Date Collected: 02/27/17 11:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.534		0.234	0.237	5.00	0.319	pCi/L		03/28/17 17:12	1

**Client Sample ID: MW-9EB**  
**Date Collected: 02/27/17 13:20**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-6**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.231	U	0.180	0.181	5.00	0.360	pCi/L		03/28/17 17:12	1

# QC Sample Results

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

TestAmerica Job ID: 280-94335-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 240-269333/1-A**  
**Matrix: Water**  
**Analysis Batch: 269518**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 269333**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.20	0.0081	mg/L		03/06/17 14:00	03/07/17 15:15	1

**Lab Sample ID: LCS 240-269333/2-A**  
**Matrix: Water**  
**Analysis Batch: 269518**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 269333**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.03		mg/L		103	80 - 120

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

**Lab Sample ID: MB 240-269333/1-A**  
**Matrix: Water**  
**Analysis Batch: 269634**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 269333**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00027	mg/L		03/06/17 14:00	03/07/17 22:19	1
Arsenic	ND		0.0050	0.00035	mg/L		03/06/17 14:00	03/07/17 22:19	1
Barium	0.00167	J	0.0050	0.00052	mg/L		03/06/17 14:00	03/07/17 22:19	1
Beryllium	ND		0.0010	0.00040	mg/L		03/06/17 14:00	03/07/17 22:19	1
Cadmium	ND		0.0010	0.00031	mg/L		03/06/17 14:00	03/07/17 22:19	1
Calcium	0.422	J	1.0	0.043	mg/L		03/06/17 14:00	03/07/17 22:19	1
Chromium	ND		0.0020	0.00026	mg/L		03/06/17 14:00	03/07/17 22:19	1
Cobalt	ND		0.0010	0.00013	mg/L		03/06/17 14:00	03/07/17 22:19	1
Lead	ND		0.0010	0.00016	mg/L		03/06/17 14:00	03/07/17 22:19	1
Lithium	ND		0.0080	0.00016	mg/L		03/06/17 14:00	03/07/17 22:19	1
Molybdenum	ND		0.010	0.00051	mg/L		03/06/17 14:00	03/07/17 22:19	1
Selenium	ND		0.0050	0.00048	mg/L		03/06/17 14:00	03/07/17 22:19	1
Thallium	ND		0.0010	0.00028	mg/L		03/06/17 14:00	03/07/17 22:19	1

**Lab Sample ID: LCS 240-269333/26-A**  
**Matrix: Water**  
**Analysis Batch: 269634**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 269333**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0900		mg/L		90	80 - 120
Arsenic	1.00	0.929		mg/L		93	80 - 120
Barium	1.00	0.991		mg/L		99	80 - 120
Beryllium	1.00	1.01		mg/L		101	80 - 120
Cadmium	1.00	1.06		mg/L		106	80 - 120
Calcium	10.0	10.7		mg/L		107	80 - 120
Chromium	1.00	0.989		mg/L		99	80 - 120
Cobalt	1.00	1.02		mg/L		102	80 - 120
Lead	1.00	1.03		mg/L		103	80 - 120
Lithium	0.100	0.100		mg/L		100	80 - 120
Molybdenum	0.100	0.0970		mg/L		97	80 - 120
Selenium	1.00	0.985		mg/L		98	80 - 120
Thallium	0.250	0.254		mg/L		102	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-94335-1

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-364787/1-A**  
**Matrix: Water**  
**Analysis Batch: 366393**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 364787**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		03/21/17 11:44	03/21/17 18:12	1

**Lab Sample ID: LCS 280-364787/2-A**  
**Matrix: Water**  
**Analysis Batch: 366393**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 364787**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	Limits
Mercury	0.00500	0.00522		mg/L		104	84 - 120

**Lab Sample ID: 280-94335-1 MS**  
**Matrix: Water**  
**Analysis Batch: 366393**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 364787**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	Limits
Mercury	ND		0.00500	0.00508		mg/L		102	75 - 125

**Lab Sample ID: 280-94335-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 366393**

**Client Sample ID: MW-8**  
**Prep Type: Total/NA**  
**Prep Batch: 364787**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Mercury	ND		0.00500	0.00508		mg/L		102	75 - 125	0	20

## Method: 9040B - pH

**Lab Sample ID: LCS 280-364292/29**  
**Matrix: Water**  
**Analysis Batch: 364292**

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

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

**Lab Sample ID: LCS 280-364804/29**  
**Matrix: Water**  
**Analysis Batch: 364804**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%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 280-364045/13**  
**Matrix: Water**  
**Analysis Batch: 364045**

**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			03/02/17 12:42	1
Fluoride	ND		0.50	0.060	mg/L			03/02/17 12:42	1
Sulfate	ND		5.0	0.23	mg/L			03/02/17 12:42	1

TestAmerica Denver



# QC Sample Results

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

TestAmerica Job ID: 280-94335-1

**Lab Sample ID: LCS 280-364045/11**  
**Matrix: Water**  
**Analysis Batch: 364045**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	98.5		mg/L		98	90 - 110
Fluoride	5.00	5.11		mg/L		102	90 - 110
Sulfate	100	99.0		mg/L		99	90 - 110

**Lab Sample ID: LCSD 280-364045/12**  
**Matrix: Water**  
**Analysis Batch: 364045**

**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	98.6		mg/L		99	90 - 110	0	10
Fluoride	5.00	5.11		mg/L		102	90 - 110	0	10
Sulfate	100	99.2		mg/L		99	90 - 110	0	10

**Lab Sample ID: MRL 280-364045/10**  
**Matrix: Water**  
**Analysis Batch: 364045**

**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	2.60	J	mg/L		104	50 - 150
Fluoride	0.200	0.199	J	mg/L		99	50 - 150
Sulfate	2.50	2.65	J	mg/L		106	50 - 150

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

**Lab Sample ID: MB 280-364046/1**  
**Matrix: Water**  
**Analysis Batch: 364046**

**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			03/02/17 08:31	1

**Lab Sample ID: LCS 280-364046/2**  
**Matrix: Water**  
**Analysis Batch: 364046**

**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	484		mg/L		97	86 - 110

**Lab Sample ID: 280-94335-1 DU**  
**Matrix: Water**  
**Analysis Batch: 364046**

**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)	2800		2800		mg/L		0.6	10

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Lab Sample ID: MB 280-364469/2**  
**Matrix: Water**  
**Analysis Batch: 364469**

**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			03/06/17 18:04	1

**Lab Sample ID: LCS 280-364469/1**  
**Matrix: Water**  
**Analysis Batch: 364469**

**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	93.2		mg/L		93	86 - 114

**Lab Sample ID: 280-94335-1 DU**  
**Matrix: Water**  
**Analysis Batch: 364469**

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

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Suspended Solids	12		10.4	F5	mg/L		11	10

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

**Lab Sample ID: MB 160-296144/1-A**  
**Matrix: Water**  
**Analysis Batch: 300406**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 296144**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.02067	U	0.0596	0.0596	1.00	0.112	pCi/L	03/06/17 10:59	03/28/17 05:57	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.1		40 - 110	03/06/17 10:59	03/28/17 05:57	1

**Lab Sample ID: LCS 160-296144/2-A**  
**Matrix: Water**  
**Analysis Batch: 300406**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 296144**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	11.60		1.21	1.00	0.117	pCi/L	102	68 - 137

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.1		40 - 110

# QC Sample Results

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

TestAmerica Job ID: 280-94335-1

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

**Lab Sample ID: MB 160-296161/1-A**  
**Matrix: Water**  
**Analysis Batch: 298257**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 296161**

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5422		0.282	0.287	1.00	0.423	pCi/L	03/06/17 13:06	03/20/17 15:55	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.1		40 - 110	03/06/17 13:06	03/20/17 15:55	1
Y Carrier	82.2		40 - 110	03/06/17 13:06	03/20/17 15:55	1

**Lab Sample ID: LCS 160-296161/2-A**  
**Matrix: Water**  
**Analysis Batch: 298257**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 296161**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	13.7	14.70		1.56	1.00	0.369	pCi/L	107	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.1		40 - 110
Y Carrier	87.9		40 - 110

# QC Association Summary

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

TestAmerica Job ID: 280-94335-1

## Metals

### Prep Batch: 269333

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total Recoverable	Water	3005A	
280-94335-2	MW-9	Total Recoverable	Water	3005A	
280-94335-3	MW-10	Total Recoverable	Water	3005A	
280-94335-4	MW-13	Total Recoverable	Water	3005A	
280-94335-5	MW10-D	Total Recoverable	Water	3005A	
280-94335-6	MW-9EB	Total Recoverable	Water	3005A	
MB 240-269333/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-269333/26-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-269333/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 269518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total Recoverable	Water	6010C	269333
280-94335-2	MW-9	Total Recoverable	Water	6010C	269333
280-94335-3	MW-10	Total Recoverable	Water	6010C	269333
280-94335-4	MW-13	Total Recoverable	Water	6010C	269333
280-94335-5	MW10-D	Total Recoverable	Water	6010C	269333
280-94335-6	MW-9EB	Total Recoverable	Water	6010C	269333
MB 240-269333/1-A	Method Blank	Total Recoverable	Water	6010C	269333
LCS 240-269333/2-A	Lab Control Sample	Total Recoverable	Water	6010C	269333

### Analysis Batch: 269634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total Recoverable	Water	6020A	269333
280-94335-2	MW-9	Total Recoverable	Water	6020A	269333
280-94335-3	MW-10	Total Recoverable	Water	6020A	269333
280-94335-4	MW-13	Total Recoverable	Water	6020A	269333
280-94335-5	MW10-D	Total Recoverable	Water	6020A	269333
280-94335-6	MW-9EB	Total Recoverable	Water	6020A	269333
MB 240-269333/1-A	Method Blank	Total Recoverable	Water	6020A	269333
LCS 240-269333/26-A	Lab Control Sample	Total Recoverable	Water	6020A	269333

### Prep Batch: 364787

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	7470A	
280-94335-2	MW-9	Total/NA	Water	7470A	
280-94335-3	MW-10	Total/NA	Water	7470A	
280-94335-4	MW-13	Total/NA	Water	7470A	
280-94335-5	MW10-D	Total/NA	Water	7470A	
280-94335-6	MW-9EB	Total/NA	Water	7470A	
MB 280-364787/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-364787/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-94335-1 MS	MW-8	Total/NA	Water	7470A	
280-94335-1 MSD	MW-8	Total/NA	Water	7470A	

### Analysis Batch: 366393

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	7470A	364787
280-94335-2	MW-9	Total/NA	Water	7470A	364787
280-94335-3	MW-10	Total/NA	Water	7470A	364787
280-94335-4	MW-13	Total/NA	Water	7470A	364787

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-94335-1

## Metals (Continued)

### Analysis Batch: 366393 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-5	MW10-D	Total/NA	Water	7470A	364787
280-94335-6	MW-9EB	Total/NA	Water	7470A	364787
MB 280-364787/1-A	Method Blank	Total/NA	Water	7470A	364787
LCS 280-364787/2-A	Lab Control Sample	Total/NA	Water	7470A	364787
280-94335-1 MS	MW-8	Total/NA	Water	7470A	364787
280-94335-1 MSD	MW-8	Total/NA	Water	7470A	364787

## General Chemistry

### Analysis Batch: 364045

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	9056A	
280-94335-1	MW-8	Total/NA	Water	9056A	
280-94335-2	MW-9	Total/NA	Water	9056A	
280-94335-2	MW-9	Total/NA	Water	9056A	
280-94335-3	MW-10	Total/NA	Water	9056A	
280-94335-3	MW-10	Total/NA	Water	9056A	
280-94335-4	MW-13	Total/NA	Water	9056A	
280-94335-4	MW-13	Total/NA	Water	9056A	
280-94335-5	MW10-D	Total/NA	Water	9056A	
280-94335-5	MW10-D	Total/NA	Water	9056A	
280-94335-6	MW-9EB	Total/NA	Water	9056A	
MB 280-364045/13	Method Blank	Total/NA	Water	9056A	
LCS 280-364045/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-364045/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-364045/10	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 364046

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	SM 2540C	
280-94335-2	MW-9	Total/NA	Water	SM 2540C	
280-94335-3	MW-10	Total/NA	Water	SM 2540C	
280-94335-4	MW-13	Total/NA	Water	SM 2540C	
280-94335-5	MW10-D	Total/NA	Water	SM 2540C	
280-94335-6	MW-9EB	Total/NA	Water	SM 2540C	
MB 280-364046/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-364046/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-94335-1 DU	MW-8	Total/NA	Water	SM 2540C	

### Analysis Batch: 364292

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	9040B	
280-94335-2	MW-9	Total/NA	Water	9040B	
280-94335-3	MW-10	Total/NA	Water	9040B	
280-94335-4	MW-13	Total/NA	Water	9040B	
280-94335-5	MW10-D	Total/NA	Water	9040B	
LCS 280-364292/29	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: 280-94335-1

## General Chemistry (Continued)

### Analysis Batch: 364469

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	SM 2540D	
280-94335-2	MW-9	Total/NA	Water	SM 2540D	
280-94335-3	MW-10	Total/NA	Water	SM 2540D	
280-94335-4	MW-13	Total/NA	Water	SM 2540D	
280-94335-5	MW10-D	Total/NA	Water	SM 2540D	
280-94335-6	MW-9EB	Total/NA	Water	SM 2540D	
MB 280-364469/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-364469/1	Lab Control Sample	Total/NA	Water	SM 2540D	
280-94335-1 DU	MW-8	Total/NA	Water	SM 2540D	

### Analysis Batch: 364804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-6	MW-9EB	Total/NA	Water	9040B	
LCS 280-364804/29	Lab Control Sample	Total/NA	Water	9040B	

## Rad

### Prep Batch: 296144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	PrecSep-21	
280-94335-2	MW-9	Total/NA	Water	PrecSep-21	
280-94335-3	MW-10	Total/NA	Water	PrecSep-21	
280-94335-4	MW-13	Total/NA	Water	PrecSep-21	
280-94335-5	MW10-D	Total/NA	Water	PrecSep-21	
280-94335-6	MW-9EB	Total/NA	Water	PrecSep-21	
MB 160-296144/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-296144/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 296161

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-94335-1	MW-8	Total/NA	Water	PrecSep_0	
280-94335-2	MW-9	Total/NA	Water	PrecSep_0	
280-94335-3	MW-10	Total/NA	Water	PrecSep_0	
280-94335-4	MW-13	Total/NA	Water	PrecSep_0	
280-94335-5	MW10-D	Total/NA	Water	PrecSep_0	
280-94335-6	MW-9EB	Total/NA	Water	PrecSep_0	
MB 160-296161/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-296161/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

# Lab Chronicle

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

TestAmerica Job ID: 280-94335-1

**Client Sample ID: MW-8**  
**Date Collected: 02/27/17 14:10**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-1**  
**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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 15:44	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 22:56	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:21	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364292	03/03/17 13:35	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/02/17 23:25	AFB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	364045	03/02/17 23:42	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.14 mL	1.0 g	296144	03/06/17 10:59	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:10	ALD	TAL SL
Total/NA	Prep	PrecSep_0			999.14 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:58	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	RTM	TAL SL

**Client Sample ID: MW-9**  
**Date Collected: 02/27/17 12:55**  
**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-2**  
**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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 15:57	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 23:00	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:27	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364292	03/03/17 13:40	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/02/17 23:59	AFB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	364045	03/03/17 00:15	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.06 mL	1.0 g	296144	03/06/17 10:59	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:10	ALD	TAL SL
Total/NA	Prep	PrecSep_0			1000.06 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:59	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	RTM	TAL SL

TestAmerica Denver



# Lab Chronicle

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

TestAmerica Job ID: 280-94335-1

**Client Sample ID: MW-10**

**Date Collected: 02/27/17 11:20**

**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-3**

**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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 16:02	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 23:05	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:29	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364292	03/03/17 13:45	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/03/17 00:32	AFB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	364045	03/03/17 00:49	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.56 mL	1.0 g	296144	03/06/17 10:59	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:10	ALD	TAL SL
Total/NA	Prep	PrecSep_0			999.56 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:59	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	RTM	TAL SL

**Client Sample ID: MW-13**

**Date Collected: 03/01/17 09:45**

**Date Received: 03/01/17 15:50**

**Lab Sample ID: 280-94335-4**

**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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 16:06	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 23:09	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:32	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364292	03/03/17 13:50	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/03/17 01:06	AFB	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	364045	03/03/17 01:23	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.13 mL	1.0 g	296144	03/06/17 10:59	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:10	ALD	TAL SL
Total/NA	Prep	PrecSep_0			1000.13 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:59	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-94335-1

**Client Sample ID: MW10-D**

**Lab Sample ID: 280-94335-5**

**Date Collected: 02/27/17 11:20**

**Matrix: Water**

**Date Received: 03/01/17 15:50**

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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 16:11	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 23:13	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:34	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364292	03/03/17 13:55	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/03/17 01:40	AFB	TAL DEN
Total/NA	Analysis	9056A		20	5 mL	5 mL	364045	03/03/17 01:56	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.61 mL	1.0 g	296144	03/06/17 10:59	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:11	ALD	TAL SL
Total/NA	Prep	PrecSep_0			999.61 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:59	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	RTM	TAL SL

**Client Sample ID: MW-9EB**

**Lab Sample ID: 280-94335-6**

**Date Collected: 02/27/17 13:20**

**Matrix: Water**

**Date Received: 03/01/17 15:50**

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	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			269518	03/07/17 16:15	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	269333	03/06/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			269634	03/07/17 23:17	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	364787	03/21/17 11:44	CDH	TAL DEN
Total/NA	Analysis	7470A		1			366393	03/21/17 18:36	CDH	TAL DEN
Total/NA	Analysis	9040B		1			364804	03/08/17 13:51	CCJ	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	364045	03/03/17 02:47	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	364046	03/02/17 08:31	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	364469	03/06/17 18:04	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			999.59 mL	1.0 g	296144	03/06/17 11:06	MBC	TAL SL
Total/NA	Analysis	9315		1			300406	03/28/17 08:11	ALD	TAL SL
Total/NA	Prep	PrecSep_0			999.59 mL	1.0 g	296161	03/06/17 13:06	MBC	TAL SL
Total/NA	Analysis	9320		1			298258	03/20/17 15:59	MLK	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			300449	03/28/17 17:12	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

TestAmerica Denver

# Certification Summary

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

TestAmerica Job ID: 280-94335-1

## Laboratory: TestAmerica Denver

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Oregon	NELAP	10	4025	01-08-18

The following analytes are included in this report, but are not certified under this certification:

Analysis Method	Prep Method	Matrix	Analyte
9040B		Water	Temperature

The following analytes are included in this report, but certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

## Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Certification ID	Expiration Date
California	State Program	9	2927	04-30-17 *
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17 *
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	03-31-17 *
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-17 *
New York	NELAP	2	10975	03-31-17 *
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17
Texas	NELAP	6	T104704517-15-5	08-31-17
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-16 *
Wisconsin	State Program	5	999518190	08-31-17

## Laboratory: TestAmerica St. Louis

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Alaska	State Program	10	MO00054	06-30-17
California	State Program	9	2886	03-31-18 *
Connecticut	State Program	1	PH-0241	03-31-17 *
Florida	NELAP	4	E87689	06-30-17
Illinois	NELAP	5	200023	11-30-17
Iowa	State Program	7	373	02-01-18
Kansas	NELAP	7	E-10236	10-31-17
Kentucky (DW)	State Program	4	90125	12-31-17
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-17

\* Certification renewal pending - certification considered valid.

TestAmerica Denver

# Certification Summary

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

TestAmerica Job ID: 280-94335-1

## Laboratory: TestAmerica St. Louis (Continued)

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

Authority	Program	EPA Region	Certification ID	Expiration Date
Louisiana (DW)	NELAP	6	LA170011	12-31-17
Maryland	State Program	3	310	09-30-17
Missouri	State Program	7	780	06-30-17
Nevada	State Program	9	MO000542017-1	07-31-17
New Jersey	NELAP	2	MO002	06-30-17 *
New York	NELAP	2	11616	03-31-17 *
North Dakota	State Program	8	R207	06-30-17
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-17
Pennsylvania	NELAP	3	68-00540	02-28-18
South Carolina	State Program	4	85002001	06-30-17
Texas	NELAP	6	T104704193-16-10	07-31-17
US Fish & Wildlife	Federal		LE058448-0	10-31-17
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-17
Virginia	NELAP	3	460230	06-14-17
Washington	State Program	10	C592	08-30-17
West Virginia DEP	State Program	3	381	08-31-17 *

\* Certification renewal pending - certification considered valid.

TestAmerica Denver

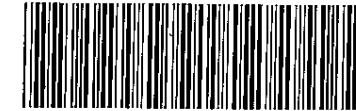
4955 Yarrow Street  
Arvada, CO 80002  
Phone (303) 736-0100 Fax (303) 431-7171

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Information		Sampler: Tara Kent	Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s):			COC No:			
Client Contact: Anna Lundin		Phone: 720 933 7496	E-Mail: stephanie.rothmeyer@testamericainc.com				Page 1 of 1			
Company: HDR Inc		Analysis Requested					Job #:			
Address: 9781 S. Meridian Blvd Suite 400		Due Date Requested:		Retained Sample Vial No. 2540C - Total Dissolved Solids (TDS) Metals - 6020A, 7470A PH - 9040B, Anions - 9056A, 28D 2540D - Total Suspended Solids 9315, Ra226, 9320, Ra228 Total Number of Vials:					Preservation Codes:	
City: Englewood		TAT Requested (days): Standard							A - HCL M - Hexane	
State, Zip: CO, 80112		PO #: DEN-001							B - NaOH N - None	
Phone: 720-633-2380(Tel)		WO #:							C - Zn Acetate O - AsNaO2	
Email: anna.lundin@hdrinc.com		Project #: 28014371							D - Nitric Acid P - Na2O4S	
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		SSOW#:		E - NaHSO4 Q - Na2SO3		F - MeOH R - Na2S2O3				
Site: Colorado				G - Amchlor S - H2SO4		H - Ascorbic Acid T - TSP Dodecahydrate				
				I - Ice U - Acetone		J - DI Water V - MCAA				
				K - EDTA W - ph 4-5		L - EDA Z - other (specify)				
				Other:						
Sample Identification		Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Retention Code	Analysis Results	Special Instructions/Note:		
MW-7	TK				Water	N				
MW-8		2.27.17	1410	C	Water	N	✓ ✓ ✓ ✓ ✓			
MW-9		2.27.17	1255	C	Water	N	✓ ✓ ✓ ✓ ✓			
MW-10		2.27.17	1120	C	Water	N	✓ ✓ ✓ ✓ ✓			
MW-13		3-1-17	0945	C	Water	N	✓ ✓ ✓ ✓ ✓			
Field Duplicate	TK MW-10D	2.27.17	1120	C	Water	N	✓ ✓ ✓ ✓ ✓			
Equipment Blank	TK MW-9EB	2.27.17	1320	C	Water	N	✓ ✓ ✓ ✓ ✓			



280-94335 Chain of Custody

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

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

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Tara Kent Date: 3-1-17 Time: 1550 Method of Shipment:

Relinquished by:	Date/Time:	Company:	Received by: [Signature]	Date/Time: 3-1-17 1550	Company: TAP
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:
Relinquished by:	Date/Time:	Company:	Received by:	Date/Time:	Company:

Custody Seals Intact:  Yes  No Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 5.9, IR#7, -0.0 3/1/17 GP  
5.3, IR#7, -0.0 3/2/17 NCB



# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Sampler:	Lab PM:	COC No:
Client Contact: Shipping/Receiving		Phone:	Rothmeyer, Steph.	280-389541.1
Company: TestAmerica Laboratories, Inc.		E-Mail:	stephanie.rothmeyer@testamericainc.com	Page: Page 1 of 1
Address: 13715 Rider Trail North,		Accreditations Required (See note):	State of Origin: Colorado	Job #: 280-94335-1

Due Date Requested: 3/30/2017		<b>Analysis Requested</b>												<b>Preservation Codes:</b> A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify)					
TAT Requested (days):																			
PO #:		Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226/Ra228_GFPC (MOD) Local Method	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB													Total Number of containers

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Analysis Requested												Total Number of containers	Special Instructions/Note:
					Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226/Ra228_GFPC (MOD) Local Method	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB									
MW-8 (280-94335-1)	2/27/17	14:10 Mountain		Water		X	X	X									2	
MW-9 (280-94335-2)	2/27/17	12:55 Mountain		Water		X	X	X									2	
MW-10 (280-94335-3)	2/27/17	11:20 Mountain		Water		X	X	X									2	
MW-13 (280-94335-4)	3/1/17	09:45 Mountain		Water		X	X	X									2	
MW10-D (280-94335-5)	2/27/17	11:20 Mountain		Water		X	X	X									2	
MW-9EB (280-94335-6)	2/27/17	13:20 Mountain		Water		X	X	X									2	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon 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.

<b>Possible Hazard Identification</b>		<b>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</b>	
Unconfirmed		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 4	Special Instructions/QC Requirements:	

Empty Kit Relinquished by: _____ Date: _____ Time: _____ Method of Shipment: _____		Received by: _____ Date/Time: _____ Company: _____			
Relinquished by: <u>Patricia We</u> Date/Time: <u>3/2/17 1515</u> Company: <u>TAD</u>		Received by: <u>Kristen Taylor</u> Date/Time: <u>3/3/17 1020</u> Company: <u>TASTL</u>		Company: _____	
Relinquished by: _____ Date/Time: _____ Company: _____		Received by: _____ Date/Time: _____ Company: _____		Company: _____	
Custody Seals Intact: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 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

4.4/CY.1

Chain of Custody Record



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information (Sub Contract Lab)</b>		Sampler:		Lab PM:		Carrier Tracking No(s):		COC No:			
Client Contact:		Phone:		E-Mail:		State of Origin:		Page:			
Shipping/Receiving:				stephanie.rothmeyer@testamericainc.com		Colorado		Page 1 of 1			
Company:				Accreditations Required (See note):				Job #:			
TestAmerica Laboratories, Inc.				NELAP - Oregon				280-94335-1			
Address:		Due Date Requested:		<b>Analysis Requested</b>						<b>Preservation Codes:</b>	
4101 Shuffel Street NW,		3/27/2017									
City:		TAT Requested (days):		Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		Total Number of Containers		A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
North Canton											
State, Zip:		PO #:		6010C/3005A (MOD) Boron		6020A/3005A (MOD) 13 Metals				Other:	
OH, 44720											
Phone:		WO #:		X		X				S12	
330-497-9396(Tel) 330-497-0772(Fax)											
Email:				X		X				Special Instructions/Note:	
Project Name:		Project #:		X		X					
Xcel Energy GW CCR Monitoring - Cherokee		28014371									
Site:		SSOW#:		X		X					
Xcel Energy CCR - Cherokee Station											
<b>Sample Identification - Client ID (Lab ID)</b>		<b>Sample Date</b>		<b>Sample Time</b>		<b>Sample Type (C=Comp, G=grab)</b>		<b>Matrix (W=water, S=solid, O=waste/oil, BT=tissue, A=Air)</b>		<b>Preservation Code:</b>	
MW-8 (280-94335-1)		2/27/17		14:10 Mountain		Water		Water		X X	
MW-9 (280-94335-2)		2/27/17		12:55 Mountain		Water		Water		X X	
MW-10 (280-94335-3)		2/27/17		11:20 Mountain		Water		Water		X X	
MW-13 (280-94335-4)		3/1/17		09:45 Mountain		Water		Water		X X	
MW10-D (280-94335-5)		2/27/17		11:20 Mountain		Water		Water		X X	
MW-9EB (280-94335-6)		2/27/17		13:20 Mountain		Water		Water		X X	
Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to TestAmerica Laboratories, Inc.											
<b>Possible Hazard Identification</b>						<b>Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)</b>					
Unconfirmed						<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months					
Deliverable Requested: I, II, III, IV, Other (specify)				Primary Deliverable Rank: 4		Special Instructions/QC Requirements:					
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:			
Relinquished by: <i>Tabinda Tule</i>		Date/Time: 3/2/17 1525		Company: TAD		Received by: <i>JOP</i>		Date/Time: 3-3-17 950		Company: TAL	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Relinquished by:		Date/Time:		Company:		Received by:		Date/Time:		Company:	
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:				Cooler Temperature(s) °C and Other Remarks:					

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3/28/2017





TestAmerica Canton Sample Receipt Form/Narrative

Login # : \_\_\_\_\_

Canton Facility

Client TA DERIVER Site Name \_\_\_\_\_  
 Cooler Received on 3-3-17 Opened on 3-3-17  
 FedEx: 1<sup>st</sup> Grd  Exp  UPS  FAS  Stetson  Client Drop Off  TestAmerica Courier  Other

Cooler unpacked by:

POP

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
2. Were custody seals on the outside of the cooler(s)? If Yes Quantity 1  Yes  No  
 -Were custody seals on the outside of the cooler(s) signed & dated?  Yes  No NA  
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?  Yes  No
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 11-15 have been checked at the originating laboratory.
11. Were sample(s) at the correct pH upon receipt?  Yes  No NA pH Strip Lot# HC682547
12. Were VOAs on the COC?  Yes  No
13. Were air bubbles >6 mm in any VOA vials?  Yes  No NA
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_  Yes  No
15. Was a LL Hg or Me Hg trip blank present? \_\_\_\_\_  Yes  No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other \_\_\_\_\_

Concerning \_\_\_\_\_

Samples processed by: \_\_\_\_\_

14. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

15. 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)

16. SAMPLE PRESERVATION

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

Ref: SOP NC-SC-0005, Sample Receiving  
 \\vacorp\corp\QA\QA\_Facilities\Canton-QA\Document-Management\Work-Instruction\In Revision\WJ-NC-099-0228\17 Cooler Receipt Form.doc djf

## Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-94335-1

**Login Number: 94335**

**List Number: 1**

**Creator: Parrott, Gregg S**

**List Source: TestAmerica Denver**

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

# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-94335-1

**Login Number: 94335**  
**List Number: 2**  
**Creator: Taylor, Kristene N**

**List Source: TestAmerica St. Louis**  
**List Creation: 03/03/17 01:59 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	19.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-94335-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-94335-1	MW-8	90.0
280-94335-2	MW-9	94.7
280-94335-3	MW-10	91.4
280-94335-4	MW-13	83.2
280-94335-5	MW10-D	98.2
280-94335-6	MW-9EB	97.1
LCS 160-296144/2-A	Lab Control Sample	99.1
MB 160-296144/1-A	Method Blank	97.1

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-94335-1	MW-8	90.0	92.0
280-94335-2	MW-9	94.7	91.6
280-94335-3	MW-10	91.4	93.5
280-94335-4	MW-13	83.2	94.2
280-94335-5	MW10-D	98.2	86.7
280-94335-6	MW-9EB	97.1	83.7
LCS 160-296161/2-A	Lab Control Sample	99.1	87.9
MB 160-296161/1-A	Method Blank	97.1	82.2

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = 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: 280-97178-1

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:

6/14/2017 2:12:41 PM

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### 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: 280-97178-1

## 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
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: 280-97178-1

**Job ID: 280-97178-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-97178-1**

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

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

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

### **RECEIPT**

The samples were received on 5/16/2017 at 10:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 4.1° C and 5.4° C.

### **TOTAL RECOVERABLE METALS**

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 05/18/2017 and analyzed on 05/19/2017.

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 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 05/18/2017 and analyzed on 05/24/2017.

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

### **TOTAL MERCURY**

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 05/31/2017.

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

### **TOTAL DISSOLVED SOLIDS**

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 05/19/2017.

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

### **TOTAL SUSPENDED SOLIDS**

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 05/17/2017.

# Case Narrative

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

TestAmerica Job ID: 280-97178-1

## Job ID: 280-97178-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

The following sample was diluted due to slow filtration and high Total Suspended Solids: MW-7 (280-97178-1). Elevated reporting limits (RLs) are provided.

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

### CORROSIVITY (PH)

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 05/18/2017 and 05/19/2017.

The following samples are not associated with a duplicate sample due to the duplicate sample failing to reaching constant pH: MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4). The parent sample reached constant pH.

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

### ANIONS (28 DAYS)

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 06/09/2017 and 06/10/2017.

Sulfate was detected in method blank MB 280-376688/6 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.

Sulfate failed the recovery criteria low for the MSD of sample 280-97629-2 in batch 280-376688. 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-7 (280-97178-1)[10X], MW-10 (280-97178-2)[10X] and MW-10D (280-97178-4)[10X] 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-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 05/19/2017 and analyzed on 06/12/2017.

The following samples were reduced due to limited volume: MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4), MW-13EB (280-97178-5).

Insufficient sample volume was available to perform a sample duplicate (DU) associated with prep batch 160-309412.

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

### RADIUM-228

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 05/19/2017 and analyzed on 06/01/2017.

The following samples were reduced due to limited volume: MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4), MW-13EB (280-97178-5).

Insufficient sample volume was available to perform a sample duplicate (DU) associated with prep batch 160-309413.

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

### RADIUM-226/RADIUM-228 (GFPC)

# Case Narrative

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

TestAmerica Job ID: 280-97178-1

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## Job ID: 280-97178-1 (Continued)

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### Laboratory: TestAmerica Denver (Continued)

Samples MW-7 (280-97178-1), MW-10 (280-97178-2), MW-13 (280-97178-3), MW-10D (280-97178-4) and MW-13EB (280-97178-5) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 06/14/2017.

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

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# Detection Summary

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

TestAmerica Job ID: 280-97178-1

**Client Sample ID: MW-7**

**Lab Sample ID: 280-97178-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	1.4		0.20	0.0081	mg/L	1		6010C	Total
Antimony	0.00062	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.013		0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.27		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Beryllium	0.0031		0.0010	0.00031	mg/L	1		6020A	Total Recoverable
Cadmium	0.00089	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	300		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.088		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.017		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.045		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.093		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.011		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0067		0.0050	0.00089	mg/L	1		6020A	Total Recoverable
Thallium	0.00091	J	0.0010	0.00020	mg/L	1		6020A	Total Recoverable
Mercury	0.000043	J	0.00020	0.000027	mg/L	1		7470A	Total/NA
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	21.8	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	730		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	620	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	1400		20	5.5	mg/L	1		SM 2540D	Total/NA

**Client Sample ID: MW-10**

**Lab Sample ID: 280-97178-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.7		0.20	0.0081	mg/L	1		6010C	Total
Antimony	0.0022		0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0039	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.061		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Cadmium	0.00083	J	0.0010	0.00021	mg/L	1		6020A	Total Recoverable
Calcium	360		1.0	0.58	mg/L	1		6020A	Total Recoverable
Cobalt	0.0036		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.10		0.0080	0.0017	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: 280-97178-1

## Client Sample ID: MW-10 (Continued)

## Lab Sample ID: 280-97178-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	0.063		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0036	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	600		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.7		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1300	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2800		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	5.6		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-97178-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.48		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Arsenic	0.00097	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.099		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	140		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0064		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00097	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.0013		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.031		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0033	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0022	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	170		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	180	B	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	890		10	4.7	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	35		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10D

## Lab Sample ID: 280-97178-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.8		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Antimony	0.0026		0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0045	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.069		0.0050	0.0022	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: 280-97178-1

## Client Sample ID: MW-10D (Continued)

## Lab Sample ID: 280-97178-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Cadmium	0.00096	J	0.0010	0.00021	mg/L	1			6020A	Total Recoverable
Calcium	440		1.0	0.58	mg/L	1			6020A	Total Recoverable
Cobalt	0.0041		0.0010	0.00019	mg/L	1			6020A	Total Recoverable
Lithium	0.11		0.0080	0.0017	mg/L	1			6020A	Total Recoverable
Molybdenum	0.073		0.010	0.0011	mg/L	1			6020A	Total Recoverable
Selenium	0.0039	J	0.0050	0.00089	mg/L	1			6020A	Total Recoverable
pH adj. to 25 deg C	8.4	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	22.2	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	600		30	2.5	mg/L	10			9056A	Total/NA
Fluoride	2.7		0.50	0.060	mg/L	1			9056A	Total/NA
Sulfate	1300	B	50	2.3	mg/L	10			9056A	Total/NA
Total Dissolved Solids (TDS)	2800		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-13EB

## Lab Sample ID: 280-97178-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil	Fac	D	Method	Prep Type
Boron	0.0092	J	0.20	0.0081	mg/L	1			6010C	Total Recoverable
Barium	0.0054		0.0050	0.0022	mg/L	1			6020A	Total Recoverable
Calcium	1.2		1.0	0.58	mg/L	1			6020A	Total Recoverable
pH adj. to 25 deg C	7.0	HF	0.1	0.1	SU	1			9040B	Total/NA
Temperature	21.7	HF	1.0	1.0	Degrees C	1			9040B	Total/NA
Chloride	1.2	J	3.0	0.25	mg/L	1			9056A	Total/NA
Sulfate	2.3	J B	5.0	0.23	mg/L	1			9056A	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: 280-97178-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-97178-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-97178-1	MW-7	Water	05/15/17 14:10	05/16/17 10:35
280-97178-2	MW-10	Water	05/15/17 12:05	05/16/17 10:35
280-97178-3	MW-13	Water	05/15/17 13:20	05/16/17 10:35
280-97178-4	MW-10D	Water	05/15/17 12:20	05/16/17 10:35
280-97178-5	MW-13EB	Water	05/15/17 13:40	05/16/17 10:35

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# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	1.4		0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 16:40	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.7		0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 16:45	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.48		0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 16:58	1

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.8		0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 17:03	1

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.0092	J	0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 17:07	1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00062	J	0.0020	0.00057	mg/L		05/18/17 14:00	05/24/17 01:11	1
Arsenic	0.013		0.0050	0.00075	mg/L		05/18/17 14:00	05/24/17 01:11	1
Barium	0.27		0.0050	0.0022	mg/L		05/18/17 14:00	05/24/17 01:11	1
Beryllium	0.0031		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 15:22	1
Cadmium	0.00089	J	0.0010	0.00021	mg/L		05/18/17 14:00	05/24/17 01:11	1
Calcium	300		1.0	0.58	mg/L		05/18/17 14:00	05/24/17 01:11	1
Chromium	0.088		0.0020	0.00098	mg/L		05/18/17 14:00	05/24/17 01:11	1
Cobalt	0.017		0.0010	0.00019	mg/L		05/18/17 14:00	05/24/17 01:11	1
Lead	0.045		0.0010	0.00045	mg/L		05/18/17 14:00	05/24/17 01:11	1
Lithium	0.093		0.0080	0.0017	mg/L		05/18/17 14:00	05/24/17 01:11	1
Molybdenum	0.011		0.010	0.0011	mg/L		05/18/17 14:00	05/24/17 01:11	1
Selenium	0.0067		0.0050	0.00089	mg/L		05/18/17 14:00	05/24/17 01:11	1
Thallium	0.00091	J	0.0010	0.00020	mg/L		05/18/17 14:00	05/24/17 01:11	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0022		0.0020	0.00057	mg/L		05/18/17 14:00	05/24/17 01:15	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0039	J	0.0050	0.00075	mg/L		05/18/17 14:00	05/24/17 01:15	1
Barium	0.061		0.0050	0.0022	mg/L		05/18/17 14:00	05/24/17 01:15	1
Beryllium	ND		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 01:15	1
Cadmium	0.00083	J	0.0010	0.00021	mg/L		05/18/17 14:00	05/24/17 01:15	1
Calcium	360		1.0	0.58	mg/L		05/18/17 14:00	05/24/17 01:15	1
Chromium	ND		0.0020	0.00098	mg/L		05/18/17 14:00	05/24/17 01:15	1
Cobalt	0.0036		0.0010	0.00019	mg/L		05/18/17 14:00	05/24/17 01:15	1
Lead	ND		0.0010	0.00045	mg/L		05/18/17 14:00	05/24/17 01:15	1
Lithium	0.10		0.0080	0.0017	mg/L		05/18/17 14:00	05/24/17 01:15	1
Molybdenum	0.063		0.010	0.0011	mg/L		05/18/17 14:00	05/24/17 01:15	1
Selenium	0.0036	J	0.0050	0.00089	mg/L		05/18/17 14:00	05/24/17 01:15	1
Thallium	ND		0.0010	0.00020	mg/L		05/18/17 14:00	05/24/17 01:15	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		05/18/17 14:00	05/24/17 01:28	1
Arsenic	0.00097	J	0.0050	0.00075	mg/L		05/18/17 14:00	05/24/17 01:28	1
Barium	0.099		0.0050	0.0022	mg/L		05/18/17 14:00	05/24/17 01:28	1
Beryllium	ND		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 01:28	1
Cadmium	ND		0.0010	0.00021	mg/L		05/18/17 14:00	05/24/17 01:28	1
Calcium	140		1.0	0.58	mg/L		05/18/17 14:00	05/24/17 01:28	1
Chromium	0.0064		0.0020	0.00098	mg/L		05/18/17 14:00	05/24/17 01:28	1
Cobalt	0.00097	J	0.0010	0.00019	mg/L		05/18/17 14:00	05/24/17 01:28	1
Lead	0.0013		0.0010	0.00045	mg/L		05/18/17 14:00	05/24/17 01:28	1
Lithium	0.031		0.0080	0.0017	mg/L		05/18/17 14:00	05/24/17 01:28	1
Molybdenum	0.0033	J	0.010	0.0011	mg/L		05/18/17 14:00	05/24/17 01:28	1
Selenium	0.0022	J	0.0050	0.00089	mg/L		05/18/17 14:00	05/24/17 01:28	1
Thallium	ND		0.0010	0.00020	mg/L		05/18/17 14:00	05/24/17 01:28	1

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.0026		0.0020	0.00057	mg/L		05/18/17 14:00	05/24/17 01:32	1
Arsenic	0.0045	J	0.0050	0.00075	mg/L		05/18/17 14:00	05/24/17 01:32	1
Barium	0.069		0.0050	0.0022	mg/L		05/18/17 14:00	05/24/17 01:32	1
Beryllium	ND		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 01:32	1
Cadmium	0.00096	J	0.0010	0.00021	mg/L		05/18/17 14:00	05/24/17 01:32	1
Calcium	440		1.0	0.58	mg/L		05/18/17 14:00	05/24/17 01:32	1
Chromium	ND		0.0020	0.00098	mg/L		05/18/17 14:00	05/24/17 01:32	1
Cobalt	0.0041		0.0010	0.00019	mg/L		05/18/17 14:00	05/24/17 01:32	1
Lead	ND		0.0010	0.00045	mg/L		05/18/17 14:00	05/24/17 01:32	1
Lithium	0.11		0.0080	0.0017	mg/L		05/18/17 14:00	05/24/17 01:32	1
Molybdenum	0.073		0.010	0.0011	mg/L		05/18/17 14:00	05/24/17 01:32	1
Selenium	0.0039	J	0.0050	0.00089	mg/L		05/18/17 14:00	05/24/17 01:32	1
Thallium	ND		0.0010	0.00020	mg/L		05/18/17 14:00	05/24/17 01:32	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		05/18/17 14:00	05/24/17 01:36	1
Arsenic	ND		0.0050	0.00075	mg/L		05/18/17 14:00	05/24/17 01:36	1
<b>Barium</b>	<b>0.0054</b>		0.0050	0.0022	mg/L		05/18/17 14:00	05/24/17 01:36	1
Beryllium	ND		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 01:36	1
Cadmium	ND		0.0010	0.00021	mg/L		05/18/17 14:00	05/24/17 01:36	1
<b>Calcium</b>	<b>1.2</b>		1.0	0.58	mg/L		05/18/17 14:00	05/24/17 01:36	1
Chromium	ND		0.0020	0.00098	mg/L		05/18/17 14:00	05/24/17 01:36	1
Cobalt	ND		0.0010	0.00019	mg/L		05/18/17 14:00	05/24/17 01:36	1
Lead	ND		0.0010	0.00045	mg/L		05/18/17 14:00	05/24/17 01:36	1
Lithium	ND		0.0080	0.0017	mg/L		05/18/17 14:00	05/24/17 01:36	1
Molybdenum	ND		0.010	0.0011	mg/L		05/18/17 14:00	05/24/17 01:36	1
Selenium	ND		0.0050	0.00089	mg/L		05/18/17 14:00	05/24/17 01:36	1
Thallium	ND		0.0010	0.00020	mg/L		05/18/17 14:00	05/24/17 01:36	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Mercury</b>	<b>0.000043</b>	<b>J</b>	0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:16	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:23	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:25	1

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:32	1

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:34	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**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			05/19/17 19:56	1
Temperature	21.8	HF	1.0	1.0	Degrees C			05/19/17 19:56	1
Chloride	730		30	2.5	mg/L			06/10/17 02:08	10
Fluoride	1.2		0.50	0.060	mg/L			06/09/17 10:44	1
Sulfate	620	B	50	2.3	mg/L			06/10/17 02:08	10
Total Dissolved Solids (TDS)	2200		20	9.4	mg/L			05/19/17 08:09	1
Total Suspended Solids	1400		20	5.5	mg/L			05/17/17 19:59	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU			05/18/17 13:39	1
Temperature	22.4	HF	1.0	1.0	Degrees C			05/18/17 13:39	1
Chloride	600		30	2.5	mg/L			06/10/17 02:25	10
Fluoride	2.7		0.50	0.060	mg/L			06/09/17 11:01	1
Sulfate	1300	B	50	2.3	mg/L			06/10/17 02:25	10
Total Dissolved Solids (TDS)	2800		20	9.4	mg/L			05/19/17 08:09	1
Total Suspended Solids	5.6		4.0	1.1	mg/L			05/17/17 19:59	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**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			05/18/17 14:03	1
Temperature	22.4	HF	1.0	1.0	Degrees C			05/18/17 14:03	1
Chloride	170		3.0	0.25	mg/L			06/09/17 11:18	1
Fluoride	1.2		0.50	0.060	mg/L			06/09/17 11:18	1
Sulfate	180	B	5.0	0.23	mg/L			06/09/17 11:18	1
Total Dissolved Solids (TDS)	890		10	4.7	mg/L			05/19/17 08:09	1
Total Suspended Solids	35		4.0	1.1	mg/L			05/17/17 19:59	1

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**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			05/18/17 13:58	1
Temperature	22.2	HF	1.0	1.0	Degrees C			05/18/17 13:58	1
Chloride	600		30	2.5	mg/L			06/10/17 02:41	10
Fluoride	2.7		0.50	0.060	mg/L			06/09/17 11:35	1
Sulfate	1300	B	50	2.3	mg/L			06/10/17 02:41	10
Total Dissolved Solids (TDS)	2800		20	9.4	mg/L			05/19/17 08:09	1
Total Suspended Solids	3.6	J	4.0	1.1	mg/L			05/17/17 19:59	1

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.0	HF	0.1	0.1	SU			05/19/17 19:51	1
Temperature	21.7	HF	1.0	1.0	Degrees C			05/19/17 19:51	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

## General Chemistry (Continued)

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	1.2	J	3.0	0.25	mg/L			06/09/17 11:52	1
Fluoride	ND		0.50	0.060	mg/L			06/09/17 11:52	1
Sulfate	2.3	J B	5.0	0.23	mg/L			06/09/17 11:52	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			05/19/17 08:09	1
Total Suspended Solids	ND		4.0	1.1	mg/L			05/17/17 19:59	1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.597		0.160	0.169	1.00	0.111	pCi/L	05/19/17 09:34	06/12/17 07:00	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	86.1		40 - 110					05/19/17 09:34	06/12/17 07:00	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0875	U	0.0783	0.0787	1.00	0.117	pCi/L	05/19/17 09:34	06/12/17 07:01	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	92.6		40 - 110					05/19/17 09:34	06/12/17 07:01	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.356		0.138	0.142	1.00	0.141	pCi/L	05/19/17 09:34	06/12/17 07:02	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	89.4		40 - 110					05/19/17 09:34	06/12/17 07:02	1

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.169		0.106	0.107	1.00	0.142	pCi/L	05/19/17 09:34	06/12/17 07:02	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	95.3		40 - 110					05/19/17 09:34	06/12/17 07:02	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0309	U	0.0583	0.0584	1.00	0.141	pCi/L	05/19/17 09:34	06/12/17 07:02	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.9		40 - 110					05/19/17 09:34	06/12/17 07:02	1

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

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.01		0.383	0.394	1.00	0.529	pCi/L	05/19/17 10:01	06/01/17 14:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	86.1		40 - 110					05/19/17 10:01	06/01/17 14:29	1
Y Carrier	86.0		40 - 110					05/19/17 10:01	06/01/17 14:29	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.978		0.353	0.364	1.00	0.479	pCi/L	05/19/17 10:01	06/01/17 14:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	92.6		40 - 110					05/19/17 10:01	06/01/17 14:29	1
Y Carrier	87.5		40 - 110					05/19/17 10:01	06/01/17 14:29	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.262	U	0.332	0.333	1.00	0.550	pCi/L	05/19/17 10:01	06/01/17 14:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.4		40 - 110					05/19/17 10:01	06/01/17 14:29	1
Y Carrier	83.7		40 - 110					05/19/17 10:01	06/01/17 14:29	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.852		0.345	0.354	1.00	0.480	pCi/L	05/19/17 10:01	06/01/17 14:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		40 - 110					05/19/17 10:01	06/01/17 14:29	1
Y Carrier	81.9		40 - 110					05/19/17 10:01	06/01/17 14:29	1

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.206	U	0.274	0.275	1.00	0.457	pCi/L	05/19/17 10:01	06/01/17 14:29	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	95.9		40 - 110					05/19/17 10:01	06/01/17 14:29	1
Y Carrier	85.2		40 - 110					05/19/17 10:01	06/01/17 14:29	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.60		0.415	0.429	5.00	0.529	pCi/L		06/14/17 11:06	1

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.07		0.361	0.373	5.00	0.479	pCi/L		06/14/17 11:06	1

**Client Sample ID: MW-13**  
**Date Collected: 05/15/17 13:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.618		0.359	0.362	5.00	0.550	pCi/L		06/14/17 11:06	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-97178-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-10D**  
**Date Collected: 05/15/17 12:20**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.02		0.361	0.370	5.00	0.480	pCi/L		06/14/17 11:06	1

**Client Sample ID: MW-13EB**  
**Date Collected: 05/15/17 13:40**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.175	U	0.280	0.281	5.00	0.457	pCi/L		06/14/17 11:06	1



# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

## Method: 6010C - Metals (ICP)

Lab Sample ID: MB 240-279459/1-A  
 Matrix: Water  
 Analysis Batch: 279711

Client Sample ID: Method Blank  
 Prep Type: Total Recoverable  
 Prep Batch: 279459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.20	0.0081	mg/L		05/18/17 14:00	05/19/17 16:10	1

Lab Sample ID: LCS 240-279459/2-A  
 Matrix: Water  
 Analysis Batch: 279711

Client Sample ID: Lab Control Sample  
 Prep Type: Total Recoverable  
 Prep Batch: 279459

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	0.996		mg/L		100	80 - 120

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

Lab Sample ID: MB 240-279459/1-A  
 Matrix: Water  
 Analysis Batch: 280184

Client Sample ID: Method Blank  
 Prep Type: Total Recoverable  
 Prep Batch: 279459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		05/18/17 14:00	05/23/17 23:01	1
Arsenic	ND		0.0050	0.00075	mg/L		05/18/17 14:00	05/23/17 23:01	1
Barium	ND		0.0050	0.0022	mg/L		05/18/17 14:00	05/23/17 23:01	1
Cadmium	ND		0.0010	0.00021	mg/L		05/18/17 14:00	05/23/17 23:01	1
Calcium	ND		1.0	0.58	mg/L		05/18/17 14:00	05/23/17 23:01	1
Chromium	ND		0.0020	0.00098	mg/L		05/18/17 14:00	05/23/17 23:01	1
Cobalt	ND		0.0010	0.00019	mg/L		05/18/17 14:00	05/23/17 23:01	1
Lead	ND		0.0010	0.00045	mg/L		05/18/17 14:00	05/23/17 23:01	1
Lithium	ND		0.0080	0.0017	mg/L		05/18/17 14:00	05/23/17 23:01	1
Molybdenum	ND		0.010	0.0011	mg/L		05/18/17 14:00	05/23/17 23:01	1
Selenium	ND		0.0050	0.00089	mg/L		05/18/17 14:00	05/23/17 23:01	1
Thallium	ND		0.0010	0.00020	mg/L		05/18/17 14:00	05/23/17 23:01	1

Lab Sample ID: MB 240-279459/1-A  
 Matrix: Water  
 Analysis Batch: 280377

Client Sample ID: Method Blank  
 Prep Type: Total Recoverable  
 Prep Batch: 279459

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		0.0010	0.00031	mg/L		05/18/17 14:00	05/24/17 15:13	1

Lab Sample ID: LCS 240-279459/3-A  
 Matrix: Water  
 Analysis Batch: 280184

Client Sample ID: Lab Control Sample  
 Prep Type: Total Recoverable  
 Prep Batch: 279459

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0951		mg/L		95	80 - 120
Arsenic	1.00	0.970		mg/L		97	80 - 120
Barium	1.00	0.976		mg/L		98	80 - 120
Cadmium	1.00	1.01		mg/L		101	80 - 120
Calcium	10.0	9.60		mg/L		96	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	1.04		mg/L		104	80 - 120
Lead	1.00	1.03		mg/L		103	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Lab Sample ID: LCS 240-279459/3-A**  
**Matrix: Water**  
**Analysis Batch: 280184**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 279459**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Lithium	0.100	0.112		mg/L		112	80 - 120
Molybdenum	0.100	0.0948		mg/L		95	80 - 120
Selenium	1.00	1.00		mg/L		100	80 - 120
Thallium	0.250	0.247		mg/L		99	80 - 120

**Lab Sample ID: LCS 240-279459/3-A**  
**Matrix: Water**  
**Analysis Batch: 280377**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 279459**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Beryllium	1.00	1.06		mg/L		106	80 - 120

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-375628/1-A**  
**Matrix: Water**  
**Analysis Batch: 375737**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 375628**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		05/31/17 11:49	05/31/17 16:07	1

**Lab Sample ID: LCS 280-375628/2-A**  
**Matrix: Water**  
**Analysis Batch: 375737**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 375628**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00500	0.00487		mg/L		97	84 - 120

**Lab Sample ID: 280-97178-1 MS**  
**Matrix: Water**  
**Analysis Batch: 375737**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 375628**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.000043	J	0.00500	0.00494		mg/L		98	75 - 125

**Lab Sample ID: 280-97178-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 375737**

**Client Sample ID: MW-7**  
**Prep Type: Total/NA**  
**Prep Batch: 375628**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.000043	J	0.00500	0.00497		mg/L		98	75 - 125	0	20

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

## Method: 9040B - pH

**Lab Sample ID: LCS 280-374294/30**  
**Matrix: Water**  
**Analysis Batch: 374294**

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

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

**Lab Sample ID: LCSD 280-374294/31**  
**Matrix: Water**  
**Analysis Batch: 374294**

**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
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101	0	5

**Lab Sample ID: LCS 280-374374/4**  
**Matrix: Water**  
**Analysis Batch: 374374**

**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 280-376688/6**  
**Matrix: Water**  
**Analysis Batch: 376688**

**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			06/09/17 10:11	1
Fluoride	ND		0.50	0.060	mg/L			06/09/17 10:11	1
Sulfate	0.630	J	5.0	0.23	mg/L			06/09/17 10:11	1

**Lab Sample ID: LCS 280-376688/4**  
**Matrix: Water**  
**Analysis Batch: 376688**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	103		mg/L		103	90 - 110
Fluoride	5.00	5.18		mg/L		104	90 - 110
Sulfate	100	102		mg/L		102	90 - 110

**Lab Sample ID: LCSD 280-376688/5**  
**Matrix: Water**  
**Analysis Batch: 376688**

**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	103		mg/L		103	90 - 110	0	10
Fluoride	5.00	5.17		mg/L		103	90 - 110	0	10
Sulfate	100	102		mg/L		102	90 - 110	0	10

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Lab Sample ID: MRL 280-376688/3**  
**Matrix: Water**  
**Analysis Batch: 376688**

**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	2.62	J	mg/L		105	50 - 150
Fluoride	0.200	0.175	J	mg/L		87	50 - 150
Sulfate	2.50	2.68	J	mg/L		107	50 - 150

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

**Lab Sample ID: MB 280-374234/1**  
**Matrix: Water**  
**Analysis Batch: 374234**

**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			05/19/17 08:09	1

**Lab Sample ID: LCS 280-374234/2**  
**Matrix: Water**  
**Analysis Batch: 374234**

**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	482		mg/L		96	86 - 110

**Lab Sample ID: LCSD 280-374234/3**  
**Matrix: Water**  
**Analysis Batch: 374234**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Total Dissolved Solids (TDS)	501	496		mg/L		99	86 - 110	3	20

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

**Lab Sample ID: MB 280-374002/2**  
**Matrix: Water**  
**Analysis Batch: 374002**

**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			05/17/17 19:59	1

**Lab Sample ID: LCS 280-374002/1**  
**Matrix: Water**  
**Analysis Batch: 374002**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Suspended Solids	100	94.4		mg/L		94	86 - 114

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Lab Sample ID: MB 160-309412/1-A**  
**Matrix: Water**  
**Analysis Batch: 312922**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 309412**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-226	0.02018	U	0.0594	0.0594	1.00	0.110	pCi/L	05/19/17 09:34	06/12/17 06:58	1
Carrier	MB MB		Limits			Prepared	Analyzed	Dil Fac		
Ba Carrier	%Yield	Qualifier		Prepared	Analyzed					
Ba Carrier	93.8		40 - 110	05/19/17 09:34	06/12/17 06:58	1				

**Lab Sample ID: LCS 160-309412/2-A**  
**Matrix: Water**  
**Analysis Batch: 312922**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 309412**

Analyte	Spike Added	LCS Result	LCS Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits
				Uncert. (2σ+/-)					
Radium-226	11.4	9.587		0.999	1.00	0.0920	pCi/L	84	68 - 137
Carrier	LCS LCS		Limits			Prepared	Analyzed	Dil Fac	
Ba Carrier	%Yield	Qualifier		Prepared	Analyzed				
Ba Carrier	99.7		40 - 110	05/19/17 09:34	06/12/17 06:58	1			

**Lab Sample ID: LCSD 160-309412/3-A**  
**Matrix: Water**  
**Analysis Batch: 312922**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 309412**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
				Uncert. (2σ+/-)							
Radium-226	11.4	9.651		1.01	1.00	0.0979	pCi/L	85	68 - 137	0.03	1
Carrier	LCSD LCSD		Limits			Prepared	Analyzed	Dil Fac			
Ba Carrier	%Yield	Qualifier		Prepared	Analyzed						
Ba Carrier	94.4		40 - 110	05/19/17 10:01	06/01/17 14:28	1					

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

**Lab Sample ID: MB 160-309413/1-A**  
**Matrix: Water**  
**Analysis Batch: 311425**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 309413**

Analyte	MB MB		Count	Total	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Radium-228	0.05889	U	0.221	0.221	1.00	0.386	pCi/L	05/19/17 10:01	06/01/17 14:28	1
Carrier	MB MB		Limits			Prepared	Analyzed	Dil Fac		
Ba Carrier	%Yield	Qualifier		Prepared	Analyzed					
Ba Carrier	93.8		40 - 110	05/19/17 10:01	06/01/17 14:28	1				
Y Carrier	%Yield	Qualifier	Limits			Prepared	Analyzed	Dil Fac		
Y Carrier	83.0		40 - 110	05/19/17 10:01	06/01/17 14:28	1				

TestAmerica Denver



# QC Sample Results

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

TestAmerica Job ID: 280-97178-1

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

**Lab Sample ID: LCS 160-309413/2-A**  
**Matrix: Water**  
**Analysis Batch: 311425**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 309413**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	13.4	12.81		1.39	1.00	0.331	pCi/L	96	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	99.7		40 - 110
Y Carrier	84.9		40 - 110

**Lab Sample ID: LCSD 160-309413/3-A**  
**Matrix: Water**  
**Analysis Batch: 311425**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 309413**

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits	RER	RER Limit
Radium-228	13.4	13.64		1.48	1.00	0.365	pCi/L	102	56 - 140	0.29	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	94.4		40 - 110
Y Carrier	81.9		40 - 110

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# QC Association Summary

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

TestAmerica Job ID: 280-97178-1

## Metals

### Prep Batch: 279459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total Recoverable	Water	3005A	
280-97178-2	MW-10	Total Recoverable	Water	3005A	
280-97178-3	MW-13	Total Recoverable	Water	3005A	
280-97178-4	MW-10D	Total Recoverable	Water	3005A	
280-97178-5	MW-13EB	Total Recoverable	Water	3005A	
MB 240-279459/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-279459/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-279459/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 279711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total Recoverable	Water	6010C	279459
280-97178-2	MW-10	Total Recoverable	Water	6010C	279459
280-97178-3	MW-13	Total Recoverable	Water	6010C	279459
280-97178-4	MW-10D	Total Recoverable	Water	6010C	279459
280-97178-5	MW-13EB	Total Recoverable	Water	6010C	279459
MB 240-279459/1-A	Method Blank	Total Recoverable	Water	6010C	279459
LCS 240-279459/2-A	Lab Control Sample	Total Recoverable	Water	6010C	279459

### Analysis Batch: 280184

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total Recoverable	Water	6020A	279459
280-97178-2	MW-10	Total Recoverable	Water	6020A	279459
280-97178-3	MW-13	Total Recoverable	Water	6020A	279459
280-97178-4	MW-10D	Total Recoverable	Water	6020A	279459
280-97178-5	MW-13EB	Total Recoverable	Water	6020A	279459
MB 240-279459/1-A	Method Blank	Total Recoverable	Water	6020A	279459
LCS 240-279459/3-A	Lab Control Sample	Total Recoverable	Water	6020A	279459

### Analysis Batch: 280377

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total Recoverable	Water	6020A	279459
MB 240-279459/1-A	Method Blank	Total Recoverable	Water	6020A	279459
LCS 240-279459/3-A	Lab Control Sample	Total Recoverable	Water	6020A	279459

### Prep Batch: 375628

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	7470A	
280-97178-2	MW-10	Total/NA	Water	7470A	
280-97178-3	MW-13	Total/NA	Water	7470A	
280-97178-4	MW-10D	Total/NA	Water	7470A	
280-97178-5	MW-13EB	Total/NA	Water	7470A	
MB 280-375628/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-375628/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-97178-1 MS	MW-7	Total/NA	Water	7470A	
280-97178-1 MSD	MW-7	Total/NA	Water	7470A	

### Analysis Batch: 375737

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	7470A	375628
280-97178-2	MW-10	Total/NA	Water	7470A	375628

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-97178-1

## Metals (Continued)

### Analysis Batch: 375737 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-3	MW-13	Total/NA	Water	7470A	375628
280-97178-4	MW-10D	Total/NA	Water	7470A	375628
280-97178-5	MW-13EB	Total/NA	Water	7470A	375628
MB 280-375628/1-A	Method Blank	Total/NA	Water	7470A	375628
LCS 280-375628/2-A	Lab Control Sample	Total/NA	Water	7470A	375628
280-97178-1 MS	MW-7	Total/NA	Water	7470A	375628
280-97178-1 MSD	MW-7	Total/NA	Water	7470A	375628

## General Chemistry

### Analysis Batch: 374002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	SM 2540D	
280-97178-2	MW-10	Total/NA	Water	SM 2540D	
280-97178-3	MW-13	Total/NA	Water	SM 2540D	
280-97178-4	MW-10D	Total/NA	Water	SM 2540D	
280-97178-5	MW-13EB	Total/NA	Water	SM 2540D	
MB 280-374002/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-374002/1	Lab Control Sample	Total/NA	Water	SM 2540D	

### Analysis Batch: 374234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	SM 2540C	
280-97178-2	MW-10	Total/NA	Water	SM 2540C	
280-97178-3	MW-13	Total/NA	Water	SM 2540C	
280-97178-4	MW-10D	Total/NA	Water	SM 2540C	
280-97178-5	MW-13EB	Total/NA	Water	SM 2540C	
MB 280-374234/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-374234/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-374234/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

### Analysis Batch: 374294

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-2	MW-10	Total/NA	Water	9040B	
280-97178-3	MW-13	Total/NA	Water	9040B	
280-97178-4	MW-10D	Total/NA	Water	9040B	
LCS 280-374294/30	Lab Control Sample	Total/NA	Water	9040B	
LCSD 280-374294/31	Lab Control Sample Dup	Total/NA	Water	9040B	

### Analysis Batch: 374374

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	9040B	
280-97178-5	MW-13EB	Total/NA	Water	9040B	
LCS 280-374374/4	Lab Control Sample	Total/NA	Water	9040B	

### Analysis Batch: 376688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	9056A	
280-97178-1	MW-7	Total/NA	Water	9056A	
280-97178-2	MW-10	Total/NA	Water	9056A	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-97178-1

## General Chemistry (Continued)

### Analysis Batch: 376688 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-2	MW-10	Total/NA	Water	9056A	
280-97178-3	MW-13	Total/NA	Water	9056A	
280-97178-4	MW-10D	Total/NA	Water	9056A	
280-97178-4	MW-10D	Total/NA	Water	9056A	
280-97178-5	MW-13EB	Total/NA	Water	9056A	
MB 280-376688/6	Method Blank	Total/NA	Water	9056A	
LCS 280-376688/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-376688/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-376688/3	Lab Control Sample	Total/NA	Water	9056A	

## Rad

### Prep Batch: 309412

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	PrecSep-21	
280-97178-2	MW-10	Total/NA	Water	PrecSep-21	
280-97178-3	MW-13	Total/NA	Water	PrecSep-21	
280-97178-4	MW-10D	Total/NA	Water	PrecSep-21	
280-97178-5	MW-13EB	Total/NA	Water	PrecSep-21	
MB 160-309412/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-309412/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCS 160-309412/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

### Prep Batch: 309413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-97178-1	MW-7	Total/NA	Water	PrecSep_0	
280-97178-2	MW-10	Total/NA	Water	PrecSep_0	
280-97178-3	MW-13	Total/NA	Water	PrecSep_0	
280-97178-4	MW-10D	Total/NA	Water	PrecSep_0	
280-97178-5	MW-13EB	Total/NA	Water	PrecSep_0	
MB 160-309413/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-309413/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCS 160-309413/3-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: 280-97178-1

**Client Sample ID: MW-7**  
**Date Collected: 05/15/17 14:10**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-1**  
**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	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			279711	05/19/17 16:40	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280184	05/24/17 01:11	AS1	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280377	05/24/17 15:22	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	375628	05/31/17 11:49	CDH	TAL DEN
Total/NA	Analysis	7470A		1			375737	05/31/17 16:16	CDH	TAL DEN
Total/NA	Analysis	9040B		1			374374	05/19/17 19:56	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	376688	06/09/17 10:44	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	376688	06/10/17 02:08	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	374234	05/19/17 08:09	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	50 mL	250 mL	374002	05/17/17 19:59	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			749.14 mL	1.0 g	309412	05/19/17 09:34	LDE	TAL SL
Total/NA	Analysis	9315		1			312922	06/12/17 07:00	RTM	TAL SL
Total/NA	Prep	PrecSep_0			749.14 mL	1.0 g	309413	05/19/17 10:01	LDE	TAL SL
Total/NA	Analysis	9320		1			311425	06/01/17 14:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			313373	06/14/17 11:06	RTM	TAL SL

**Client Sample ID: MW-10**  
**Date Collected: 05/15/17 12:05**  
**Date Received: 05/16/17 10:35**

**Lab Sample ID: 280-97178-2**  
**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	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			279711	05/19/17 16:45	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280184	05/24/17 01:15	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	375628	05/31/17 11:49	CDH	TAL DEN
Total/NA	Analysis	7470A		1			375737	05/31/17 16:23	CDH	TAL DEN
Total/NA	Analysis	9040B		1			374294	05/18/17 13:39	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	376688	06/09/17 11:01	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	376688	06/10/17 02:25	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	374234	05/19/17 08:09	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	374002	05/17/17 19:59	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			750.19 mL	1.0 g	309412	05/19/17 09:34	LDE	TAL SL
Total/NA	Analysis	9315		1			312922	06/12/17 07:01	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.19 mL	1.0 g	309413	05/19/17 10:01	LDE	TAL SL
Total/NA	Analysis	9320		1			311425	06/01/17 14:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			313373	06/14/17 11:06	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-97178-1

**Client Sample ID: MW-13**

**Lab Sample ID: 280-97178-3**

**Date Collected: 05/15/17 13:20**

**Matrix: Water**

**Date Received: 05/16/17 10:35**

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	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			279711	05/19/17 16:58	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280184	05/24/17 01:28	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	375628	05/31/17 11:49	CDH	TAL DEN
Total/NA	Analysis	7470A		1			375737	05/31/17 16:25	CDH	TAL DEN
Total/NA	Analysis	9040B		1			374294	05/18/17 14:03	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	376688	06/09/17 11:18	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	374234	05/19/17 08:09	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	374002	05/17/17 19:59	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			750.34 mL	1.0 g	309412	05/19/17 09:34	LDE	TAL SL
Total/NA	Analysis	9315		1			313012	06/12/17 07:02	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.34 mL	1.0 g	309413	05/19/17 10:01	LDE	TAL SL
Total/NA	Analysis	9320		1			311425	06/01/17 14:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			313373	06/14/17 11:06	RTM	TAL SL

**Client Sample ID: MW-10D**

**Lab Sample ID: 280-97178-4**

**Date Collected: 05/15/17 12:20**

**Matrix: Water**

**Date Received: 05/16/17 10:35**

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	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			279711	05/19/17 17:03	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280184	05/24/17 01:32	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	375628	05/31/17 11:49	CDH	TAL DEN
Total/NA	Analysis	7470A		1			375737	05/31/17 16:32	CDH	TAL DEN
Total/NA	Analysis	9040B		1			374294	05/18/17 13:58	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	376688	06/09/17 11:35	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	376688	06/10/17 02:41	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	374234	05/19/17 08:09	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	374002	05/17/17 19:59	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			750.51 mL	1.0 g	309412	05/19/17 09:34	LDE	TAL SL
Total/NA	Analysis	9315		1			313012	06/12/17 07:02	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.51 mL	1.0 g	309413	05/19/17 10:01	LDE	TAL SL
Total/NA	Analysis	9320		1			311425	06/01/17 14:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			313373	06/14/17 11:06	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-97178-1

**Client Sample ID: MW-13EB**

**Lab Sample ID: 280-97178-5**

**Date Collected: 05/15/17 13:40**

**Matrix: Water**

**Date Received: 05/16/17 10:35**

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	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			279711	05/19/17 17:07	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	279459	05/18/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			280184	05/24/17 01:36	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	375628	05/31/17 11:49	CDH	TAL DEN
Total/NA	Analysis	7470A		1			375737	05/31/17 16:34	CDH	TAL DEN
Total/NA	Analysis	9040B		1			374374	05/19/17 19:51	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	376688	06/09/17 11:52	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	374234	05/19/17 08:09	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	374002	05/17/17 19:59	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			750.69 mL	1.0 g	309412	05/19/17 09:34	LDE	TAL SL
Total/NA	Analysis	9315		1			313012	06/12/17 07:02	RTM	TAL SL
Total/NA	Prep	PrecSep_0			750.69 mL	1.0 g	309413	05/19/17 10:01	LDE	TAL SL
Total/NA	Analysis	9320		1			311425	06/01/17 14:29	RTM	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			313373	06/14/17 11:06	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: 280-97178-1

## 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	01-08-18

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

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
9056A		Water	Chloride
9056A		Water	Fluoride
9056A		Water	Sulfate

## 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	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17
Florida	NELAP	4	E87225	06-30-17 *
Illinois	NELAP	5	200004	07-31-17 *
Kansas	NELAP	7	E-10336	01-31-18
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17
Minnesota	NELAP	5	039-999-348	12-31-17
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
Nevada	State Program	9	OH-000482008A	07-31-17 *
New Jersey	NELAP	2	OH001	06-30-17 *
New York	NELAP	2	10975	03-31-18
Ohio VAP	State Program	5	CL0024	09-14-17
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17
Washington	State Program	10	C971	01-12-18
West Virginia DEP	State Program	3	210	12-31-17
Wisconsin	State Program	5	999518190	08-31-17 *

## 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	06-30-17 *
California	State Program	9	2886	03-31-18 *
Connecticut	State Program	1	PH-0241	03-31-19
Florida	NELAP	4	E87689	06-30-17 *
Illinois	NELAP	5	200023	11-30-17
Iowa	State Program	7	373	02-01-18
Kansas	NELAP	7	E-10236	10-31-17
Kentucky (DW)	State Program	4	90125	12-31-17
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-17 *

\* 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: 280-97178-1

## 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
Louisiana (DW)	NELAP	6	LA170011	12-31-17
Maryland	State Program	3	310	09-30-17
Missouri	State Program	7	780	06-30-17 *
Nevada	State Program	9	MO000542017-1	07-31-17 *
New Jersey	NELAP	2	MO002	06-30-17 *
New York	NELAP	2	11616	03-31-18
North Dakota	State Program	8	R207	06-30-17 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-17
Pennsylvania	NELAP	3	68-00540	02-21-18
South Carolina	State Program	4	85002001	06-30-17 *
Texas	NELAP	6	T104704193-16-10	07-31-17 *
US Fish & Wildlife	Federal		LE058448-0	10-31-17
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-17 *
Virginia	NELAP	3	460230	06-14-18
Washington	State Program	10	C592	08-30-17
West Virginia DEP	State Program	3	381	08-31-17 *

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



TestAmerica Denver

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

Chain of Custody Record



280-97178 Chain of Custody



LEADER IN ENVIRONMENTAL TESTING

<b>Client Information</b>					Sampler: <u>J. Bills</u>					Lab PM: Rothmeyer, Stephanie K																																					
Client Contact: Anna Lundin					Phone: <u>518-331-7027</u>					E-Mail: <u>stephanie.rothmeyer@testa.com</u>																																					
Company: HDR Inc					Due Date Requested:					Analysis Requested																																					
Address: 9781 S. Meridian Blve Suite 400					TAT Requested (days): <b>Standard</b>					<table border="1"> <tr> <th>Field Filtered Sample (Yes or No)</th> <th>Perform MS/MSD (Yes or No)</th> <th>2540C - Total Dissolved Solids (TDS)</th> <th>Metals - 6020A, 7470A</th> <th>pH - 9040B, Anions - 9056A, 28D</th> <th>2540D - Total Suspended Solids</th> <th>9315_Ra226, 9320_Ra228</th> <th>Total Number of containers</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>					Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6020A, 7470A	pH - 9040B, Anions - 9056A, 28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers																									
Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	Metals - 6020A, 7470A	pH - 9040B, Anions - 9056A, 28D	2540D - Total Suspended Solids	9315_Ra226, 9320_Ra228	Total Number of containers																																								
City: Englewood					PO #: DEN-001										<table border="1"> <tr> <th colspan="2">Preservation Codes:</th> </tr> <tr> <td>A - HCL</td> <td>M - Hexane</td> </tr> <tr> <td>B - NaOH</td> <td>N - None</td> </tr> <tr> <td>C - Zn Acetate</td> <td>O - 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 - Na2S2SO3</td> </tr> <tr> <td>G - Amchlor</td> <td>S - H2SO4</td> </tr> <tr> <td>H - Ascorbic Acid</td> <td>T - TSP Dodecahydrate</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 - EDA</td> <td>Z - other (specify)</td> </tr> <tr> <td colspan="2">Other:</td> </tr> </table>					Preservation Codes:		A - HCL	M - Hexane	B - NaOH	N - None	C - Zn Acetate	O - AsNaO2	D - Nitric Acid	P - Na2O4S	E - NaHSO4	Q - Na2SO3	F - MeOH	R - Na2S2SO3	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:	
Preservation Codes:																																															
A - HCL	M - Hexane																																														
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L - EDA	Z - other (specify)																																														
Other:																																															
State, Zip: CO, 80112					WO #:					Page: <u>1</u> of <u>1</u>																																					
Phone: 720-633-2380(Tel)					Project #: 28014371					Job #:																																					
Email: anna.lundin@hdrinc.com					SSOW#:					Special Instructions/Note:																																					
Project Name: Xcel Energy GW CCR Monitoring - Cherokee					Site: Colorado																																										
Sample Identification					Sample Date					Sample Time																																					
Sample Type (C=comp, G=grab)					Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)					Preservation Code:																																					
MW-7					5/15/17					1410																																					
MW-8 <del>SB</del>																																															
MW-9 <del>JS</del>																																															
MW-10					5/15/17					1205																																					
MW-13					5/15/17					1320																																					
Field Duplicate <del>SB</del> MW-10D					5/15/17					1220																																					
Equipment Blank <del>SB</del> MW-13EB					5/15/17					1340																																					
Possible Hazard Identification					Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																																										
<input checked="" type="checkbox"/> Non-Hazard					<input type="checkbox"/> Flammable					<input type="checkbox"/> Skin Irritant																																					
<input type="checkbox"/> Poison B					<input type="checkbox"/> Unknown					<input type="checkbox"/> Radiological																																					
Deliverable Requested: I, II, III, IV, Other (specify)					<input type="checkbox"/> Return To Client					<input checked="" type="checkbox"/> Disposal By Lab																																					
					<input type="checkbox"/> Archive For					Months																																					
Empty Kit Relinquished by:					Date:					Time:																																					
Date/Time:					Company:					Received by:																																					
Date/Time:					Company:					Date/Time:																																					
Date/Time:					Company:					Date/Time:																																					
Custody Seals Intact: Δ Yes Δ No					Custody Seal No.:					Cooler Temperature(s) °C and Other Remarks: 5.4, 4.1, 4.0, 0.0 JS #7 JS 5/16/17																																					

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6/14/2017





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

**Chain of Custody Record**



280-97178 Chain of Custody



LEADER IN ENVIRONMENTAL TESTING

**Client Information (Sub Contract Lab)**

Client Contact: **Stephanie K** Lab P#:  
 Shipping/Receiving: **stephanie.rolh Meyer@testamericacn.com** E-Mail: **stephanie.rolh Meyer@testamericacn.com** State of Origin: **Colorado**  
 Company: **TestAmerica Laboratories, Inc.** Accreditations Required (See note): **NELAP - Oregon**  
 Address: **13715 Rider Trail North,** Due Date Requested: **6/14/2017** Job #: **280-97178-1**  
 City: **Earth City** TAT Requested (days): **1** Page: **1 of 1**  
 State, Zip: **MO, 63045** PO #:  
 Phone: **314-298-8566(Tel) 314-298-8757(Fax)** WO #:  
 Email: **Project #:**  
**28014371**  
 Project Name: **Xcel Energy GW CCR Monitoring - Cherokee**  
 Site: **Xcel Energy CCR - Cherokee Station** S#:  
**SSOW#:**

**Analysis Requested**

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=water/oil, B=risks, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Method	Substance	Total Number of containers	Special Instructions/Note:
MMW-7 (280-97178-1)	5/15/17	14:10	Water	Water	X	X	Ra226/Ra228_GFPC/ (MOD) Local Method	9315_Ra226/PrecSep_21 Radium-226 - 1/3 - SUB	2	
MMW-10 (280-97178-2)	5/15/17	12:05	Water	Water	X	X		9320_Ra228/PrecSep_0 Radium-228 - 2/3 - SUB	2	
MMW-13 (280-97178-3)	5/15/17	13:20	Water	Water	X	X			2	
MMW-10D (280-97178-4)	5/15/17	12:20	Water	Water	X	X			2	
MMW-13EB (280-97178-5)	5/15/17	13:40	Water	Water	X	X			2	

**Possible Hazard Identification**  
 Unconfirmed  
 Deliverable Requested: I, II, III, IV, Other (specify) \_\_\_\_\_ Primary Deliverable Rank: 4  
 Special Instructions/QC Requirements: \_\_\_\_\_

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

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

Relinquished by: **[Signature]** Date/Time: **5/16/17 15:15** Company: **TAD** Received by: **[Signature]** Date/Time: **5/17/17 09:28** Company: **TAD**

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_ Received by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

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

# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-97178-1

**Login Number: 97178**

**List Number: 1**

**Creator: True, Joshua A**

**List Source: TestAmerica Denver**

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



# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-97178-1

**Login Number: 97178**  
**List Number: 3**  
**Creator: Taylor, Kristene N**

**List Source: TestAmerica St. Louis**  
**List Creation: 05/17/17 03:24 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is <=/ background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	



## Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-97178-1

**Login Number: 97178**  
**List Number: 4**  
**Creator: Taylor, Kristene N**

**List Source: TestAmerica St. Louis**  
**List Creation: 05/17/17 03:28 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	18.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-97178-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-97178-1	MW-7	86.1
280-97178-2	MW-10	92.6
280-97178-3	MW-13	89.4
280-97178-4	MW-10D	95.3
280-97178-5	MW-13EB	95.9
LCS 160-309412/2-A	Lab Control Sample	99.7
LCSD 160-309412/3-A	Lab Control Sample Dup	94.4
MB 160-309412/1-A	Method Blank	93.8

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-97178-1	MW-7	86.1	86.0
280-97178-2	MW-10	92.6	87.5
280-97178-3	MW-13	89.4	83.7
280-97178-4	MW-10D	95.3	81.9
280-97178-5	MW-13EB	95.9	85.2
LCS 160-309413/2-A	Lab Control Sample	99.7	84.9
LCSD 160-309413/3-A	Lab Control Sample Dup	94.4	81.9
MB 160-309413/1-A	Method Blank	93.8	83.0

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = 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: 280-99315-1

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

For:

HDR Inc  
1670 Broadway, Suite 3400  
Denver, Colorado 80202

Attn: Molly Reeves



Authorized for release by:  
8/16/2017 10:56:37 AM

Stephanie Rothmeyer, Project Manager I  
(303)736-0182

[stephanie.rothmeyer@testamericainc.com](mailto:stephanie.rothmeyer@testamericainc.com)

### LINKS

Review your project  
results through  
**TotalAccess**

Have a Question?



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[www.testamericainc.com](http://www.testamericainc.com)

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

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

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

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# Definitions/Glossary

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

TestAmerica Job ID: 280-99315-1

## 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
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: 280-99315-1

**Job ID: 280-99315-1**

**Laboratory: TestAmerica Denver**

**Narrative**

## CASE NARRATIVE

**Client: HDR Inc**

**Project: Xcel Energy GW CCR Monitoring - Cherokee**

**Report Number: 280-99315-1**

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

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

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

### **RECEIPT**

The samples were received on 7/18/2017 at 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 8.9° C and 12.2° C.

The following samples were received at the laboratory outside the required temperature criteria: MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4), MW-10EB (280-99315-5). The samples were received on ice at temperatures of 8.9 C and 12.2 C. The client was notified on 7/18/17.

### **TOTAL RECOVERABLE METALS**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/24/2017 and analyzed on 07/25/2017.

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 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020A. The samples were prepared on 07/24/2017 and analyzed on 07/25/2017 and 07/26/2017.

Calcium failed the recovery criteria high for the MS and MSD of sample 240-82659-1 in batch 240-288707. 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 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 07/24/2017.

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

### **TOTAL DISSOLVED SOLIDS**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 07/24/2017.

# Case Narrative

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

TestAmerica Job ID: 280-99315-1

## Job ID: 280-99315-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

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

#### **TOTAL SUSPENDED SOLIDS**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 07/20/2017.

Total Suspended Solids exceeded the RPD limit for the duplicate of sample 280-99372-1. Refer to the QC report for details.

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

#### **CORROSIVITY (PH)**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for corrosivity (pH) in accordance with EPA SW-846 Method 9040B. The samples were analyzed on 07/19/2017 and 08/02/2017.

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

#### **ANIONS (28 DAYS)**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 08/01/2017.

Sulfate was detected in method blank MB 280-382750/6 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.

Samples MW-7 (280-99315-1)[10X], MW-10 (280-99315-2)[10X] and MW-10D (280-99315-4)[10X] 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-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 07/24/2017 and analyzed on 08/15/2017.

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

#### **RADIUM-228**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 07/24/2017 and analyzed on 08/03/2017.

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

#### **RADIUM-226/RADIUM-228 (GFPC)**

Samples MW-7 (280-99315-1), MW-10 (280-99315-2), MW-13 (280-99315-3), MW-10D (280-99315-4) and MW-10EB (280-99315-5) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 08/15/2017.

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: 280-99315-1

## Client Sample ID: MW-7

## Lab Sample ID: 280-99315-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	2.0		0.20	0.0081	mg/L	1		6010C	Total
Arsenic	0.0023	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.079		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	240		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0044		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0040		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.0024		0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.060		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.012		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0011	J	0.0050	0.00089	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	24.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	680		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	1.3		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	570	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2100		40	19	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	17		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10

## Lab Sample ID: 280-99315-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	4.2		0.20	0.0081	mg/L	1		6010C	Total
Antimony	0.00090	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0076		0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.059		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	390		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0036		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lead	0.00057	J	0.0010	0.00045	mg/L	1		6020A	Total Recoverable
Lithium	0.12		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.061		0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0045	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.1	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	410		30	2.5	mg/L	10		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: 280-99315-1

## Client Sample ID: MW-10 (Continued)

## Lab Sample ID: 280-99315-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	2.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1300	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2600		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	28		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-13

## Lab Sample ID: 280-99315-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.47		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Arsenic	0.00087	J	0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.068		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	110		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0017	J	0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.00035	J	0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.037		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.0023	J	0.010	0.0011	mg/L	1		6020A	Total Recoverable
Selenium	0.0030	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	7.9	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.2	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	140		3.0	0.25	mg/L	1		9056A	Total/NA
Fluoride	1.2		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	170	B	5.0	0.23	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	770		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	6.4		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10D

## Lab Sample ID: 280-99315-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	4.2		0.20	0.0081	mg/L	1		6010C	Total Recoverable
Antimony	0.00076	J	0.0020	0.00057	mg/L	1		6020A	Total Recoverable
Arsenic	0.0070		0.0050	0.00075	mg/L	1		6020A	Total Recoverable
Barium	0.058		0.0050	0.0022	mg/L	1		6020A	Total Recoverable
Calcium	390		1.0	0.58	mg/L	1		6020A	Total Recoverable
Chromium	0.0039		0.0020	0.00098	mg/L	1		6020A	Total Recoverable
Cobalt	0.0021		0.0010	0.00019	mg/L	1		6020A	Total Recoverable
Lithium	0.11		0.0080	0.0017	mg/L	1		6020A	Total Recoverable
Molybdenum	0.060		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: 280-99315-1

## Client Sample ID: MW-10D (Continued)

## Lab Sample ID: 280-99315-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Selenium	0.0042	J	0.0050	0.00089	mg/L	1		6020A	Total Recoverable
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	24.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Chloride	410		30	2.5	mg/L	10		9056A	Total/NA
Fluoride	2.5		0.50	0.060	mg/L	1		9056A	Total/NA
Sulfate	1400	B	50	2.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2500		20	9.4	mg/L	1		SM 2540C	Total/NA
Total Suspended Solids	27		4.0	1.1	mg/L	1		SM 2540D	Total/NA

## Client Sample ID: MW-10EB

## Lab Sample ID: 280-99315-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	0.012	J	0.20	0.0081	mg/L	1		6010C	Total Recoverable
pH adj. to 25 deg C	6.2	HF	0.1	0.1	SU	1		9040B	Total/NA
Temperature	22.4	HF	1.0	1.0	Degrees C	1		9040B	Total/NA
Total Suspended Solids	1.2	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: 280-99315-1

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL CAN
6020A	Metals (ICP/MS)	SW846	TAL CAN
7470A	Mercury (CVAA)	SW846	TAL DEN
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

#### 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: 280-99315-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-99315-1	MW-7	Water	07/17/17 12:00	07/18/17 12:50
280-99315-2	MW-10	Water	07/18/17 11:35	07/18/17 12:50
280-99315-3	MW-13	Water	07/17/17 13:40	07/18/17 12:50
280-99315-4	MW-10D	Water	07/18/17 11:35	07/18/17 12:50
280-99315-5	MW-10EB	Water	07/18/17 12:10	07/18/17 12:50

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# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	2.0		0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 15:59	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	4.2		0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 16:03	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.47		0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 16:08	1

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	4.2		0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 16:13	1

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	0.012	J	0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 16:18	1

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

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/24/17 14:00	07/26/17 12:31	1
Arsenic	0.0023	J	0.0050	0.00075	mg/L		07/24/17 14:00	07/26/17 12:31	1
Barium	0.079		0.0050	0.0022	mg/L		07/24/17 14:00	07/26/17 12:31	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/26/17 12:31	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/26/17 12:31	1
Calcium	240		1.0	0.58	mg/L		07/24/17 14:00	07/26/17 12:31	1
Chromium	0.0044		0.0020	0.00098	mg/L		07/24/17 14:00	07/26/17 12:31	1
Cobalt	0.0040		0.0010	0.00019	mg/L		07/24/17 14:00	07/26/17 12:31	1
Lead	0.0024		0.0010	0.00045	mg/L		07/24/17 14:00	07/26/17 12:31	1
Lithium	0.060		0.0080	0.0017	mg/L		07/24/17 14:00	07/26/17 12:31	1
Molybdenum	0.012		0.010	0.0011	mg/L		07/24/17 14:00	07/26/17 12:31	1
Selenium	0.0011	J	0.0050	0.00089	mg/L		07/24/17 14:00	07/26/17 12:31	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/26/17 12:31	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	0.00090	J	0.0020	0.00057	mg/L		07/24/17 14:00	07/25/17 19:26	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Arsenic</b>	<b>0.0076</b>		0.0050	0.00075	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Barium</b>	<b>0.059</b>		0.0050	0.0022	mg/L		07/24/17 14:00	07/25/17 19:26	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/25/17 19:26	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Calcium</b>	<b>390</b>		1.0	0.58	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Chromium</b>	<b>0.0036</b>		0.0020	0.00098	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Cobalt</b>	<b>0.0021</b>		0.0010	0.00019	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Lead</b>	<b>0.00057</b>	<b>J</b>	0.0010	0.00045	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Lithium</b>	<b>0.12</b>		0.0080	0.0017	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Molybdenum</b>	<b>0.061</b>		0.010	0.0011	mg/L		07/24/17 14:00	07/25/17 19:26	1
<b>Selenium</b>	<b>0.0045</b>	<b>J</b>	0.0050	0.00089	mg/L		07/24/17 14:00	07/25/17 19:26	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/25/17 19:26	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Arsenic</b>	<b>0.00087</b>	<b>J</b>	0.0050	0.00075	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Barium</b>	<b>0.068</b>		0.0050	0.0022	mg/L		07/24/17 14:00	07/25/17 19:30	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/25/17 19:30	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Calcium</b>	<b>110</b>		1.0	0.58	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Chromium</b>	<b>0.0017</b>	<b>J</b>	0.0020	0.00098	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Cobalt</b>	<b>0.00035</b>	<b>J</b>	0.0010	0.00019	mg/L		07/24/17 14:00	07/25/17 19:30	1
Lead	ND		0.0010	0.00045	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Lithium</b>	<b>0.037</b>		0.0080	0.0017	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Molybdenum</b>	<b>0.0023</b>	<b>J</b>	0.010	0.0011	mg/L		07/24/17 14:00	07/25/17 19:30	1
<b>Selenium</b>	<b>0.0030</b>	<b>J</b>	0.0050	0.00089	mg/L		07/24/17 14:00	07/25/17 19:30	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/25/17 19:30	1

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Antimony</b>	<b>0.00076</b>	<b>J</b>	0.0020	0.00057	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Arsenic</b>	<b>0.0070</b>		0.0050	0.00075	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Barium</b>	<b>0.058</b>		0.0050	0.0022	mg/L		07/24/17 14:00	07/25/17 19:42	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/25/17 19:42	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Calcium</b>	<b>390</b>		1.0	0.58	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Chromium</b>	<b>0.0039</b>		0.0020	0.00098	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Cobalt</b>	<b>0.0021</b>		0.0010	0.00019	mg/L		07/24/17 14:00	07/25/17 19:42	1
Lead	ND		0.0010	0.00045	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Lithium</b>	<b>0.11</b>		0.0080	0.0017	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Molybdenum</b>	<b>0.060</b>		0.010	0.0011	mg/L		07/24/17 14:00	07/25/17 19:42	1
<b>Selenium</b>	<b>0.0042</b>	<b>J</b>	0.0050	0.00089	mg/L		07/24/17 14:00	07/25/17 19:42	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/25/17 19:42	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/24/17 14:00	07/25/17 19:46	1
Arsenic	ND		0.0050	0.00075	mg/L		07/24/17 14:00	07/25/17 19:46	1
Barium	ND		0.0050	0.0022	mg/L		07/24/17 14:00	07/25/17 19:46	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/25/17 19:46	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/25/17 19:46	1
Calcium	ND		1.0	0.58	mg/L		07/24/17 14:00	07/25/17 19:46	1
Chromium	ND		0.0020	0.00098	mg/L		07/24/17 14:00	07/25/17 19:46	1
Cobalt	ND		0.0010	0.00019	mg/L		07/24/17 14:00	07/25/17 19:46	1
Lead	ND		0.0010	0.00045	mg/L		07/24/17 14:00	07/25/17 19:46	1
Lithium	ND		0.0080	0.0017	mg/L		07/24/17 14:00	07/25/17 19:46	1
Molybdenum	ND		0.010	0.0011	mg/L		07/24/17 14:00	07/25/17 19:46	1
Selenium	ND		0.0050	0.00089	mg/L		07/24/17 14:00	07/25/17 19:46	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/25/17 19:46	1

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 16:06	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 16:09	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 16:11	1

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 16:13	1

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 16:15	1

TestAmerica Denver



# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

## General Chemistry

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**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			07/19/17 17:56	1
Temperature	24.4	HF	1.0	1.0	Degrees C			07/19/17 17:56	1
Chloride	680		30	2.5	mg/L			08/01/17 12:41	10
Fluoride	1.3		0.50	0.060	mg/L			08/01/17 10:46	1
Sulfate	570	B	50	2.3	mg/L			08/01/17 12:41	10
Total Dissolved Solids (TDS)	2100		40	19	mg/L			07/24/17 08:10	1
Total Suspended Solids	17		4.0	1.1	mg/L			07/20/17 18:20	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	7.1	HF	0.1	0.1	SU			07/19/17 17:51	1
Temperature	24.4	HF	1.0	1.0	Degrees C			07/19/17 17:51	1
Chloride	410		30	2.5	mg/L			08/01/17 12:58	10
Fluoride	2.5		0.50	0.060	mg/L			08/01/17 11:03	1
Sulfate	1300	B	50	2.3	mg/L			08/01/17 12:58	10
Total Dissolved Solids (TDS)	2600		20	9.4	mg/L			07/24/17 08:10	1
Total Suspended Solids	28		4.0	1.1	mg/L			07/20/17 18:20	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**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			07/19/17 18:01	1
Temperature	24.2	HF	1.0	1.0	Degrees C			07/19/17 18:01	1
Chloride	140		3.0	0.25	mg/L			08/01/17 11:20	1
Fluoride	1.2		0.50	0.060	mg/L			08/01/17 11:20	1
Sulfate	170	B	5.0	0.23	mg/L			08/01/17 11:20	1
Total Dissolved Solids (TDS)	770		20	9.4	mg/L			07/24/17 08:10	1
Total Suspended Solids	6.4		4.0	1.1	mg/L			07/20/17 18:20	1

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C	8.5	HF	0.1	0.1	SU			07/19/17 18:27	1
Temperature	24.4	HF	1.0	1.0	Degrees C			07/19/17 18:27	1
Chloride	410		30	2.5	mg/L			08/01/17 13:14	10
Fluoride	2.5		0.50	0.060	mg/L			08/01/17 11:37	1
Sulfate	1400	B	50	2.3	mg/L			08/01/17 13:14	10
Total Dissolved Solids (TDS)	2500		20	9.4	mg/L			07/24/17 08:10	1
Total Suspended Solids	27		4.0	1.1	mg/L			07/20/17 18:20	1

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**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			08/02/17 14:32	1
Temperature	22.4	HF	1.0	1.0	Degrees C			08/02/17 14:32	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

## General Chemistry (Continued)

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.0	0.25	mg/L			08/01/17 11:53	1
Fluoride	ND		0.50	0.060	mg/L			08/01/17 11:53	1
Sulfate	ND		5.0	0.23	mg/L			08/01/17 11:53	1
Total Dissolved Solids (TDS)	ND		10	4.7	mg/L			07/24/17 08:10	1
<b>Total Suspended Solids</b>	<b>1.2</b>	<b>J</b>	4.0	1.1	mg/L			07/20/17 18:20	1

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

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.364</b>		0.102	0.107	1.00	0.0725	pCi/L	07/24/17 10:50	08/15/17 06:41	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	96.2		40 - 110					07/24/17 10:50	08/15/17 06:41	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.147</b>		0.0743	0.0755	1.00	0.0899	pCi/L	07/24/17 10:50	08/15/17 06:41	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	101		40 - 110					07/24/17 10:50	08/15/17 06:41	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.272</b>		0.0925	0.0957	1.00	0.0842	pCi/L	07/24/17 10:50	08/15/17 06:41	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.1		40 - 110					07/24/17 10:50	08/15/17 06:41	1

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
<b>Radium-226</b>	<b>0.155</b>		0.0748	0.0761	1.00	0.0863	pCi/L	07/24/17 10:50	08/15/17 06:41	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		40 - 110					07/24/17 10:50	08/15/17 06:41	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0276	U	0.0508	0.0509	1.00	0.0907	pCi/L	07/24/17 10:50	08/15/17 06:41	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	97.1		40 - 110					07/24/17 10:50	08/15/17 06:41	1

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

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.31		0.276	0.301	1.00	0.295	pCi/L	07/24/17 12:10	08/03/17 09:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	96.2		40 - 110					07/24/17 12:10	08/03/17 09:24	1
Y Carrier	91.6		40 - 110					07/24/17 12:10	08/03/17 09:24	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.947		0.226	0.242	1.00	0.251	pCi/L	07/24/17 12:10	08/03/17 09:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					07/24/17 12:10	08/03/17 09:24	1
Y Carrier	95.8		40 - 110					07/24/17 12:10	08/03/17 09:24	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.330		0.186	0.189	1.00	0.277	pCi/L	07/24/17 12:10	08/03/17 09:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.1		40 - 110					07/24/17 12:10	08/03/17 09:24	1
Y Carrier	97.7		40 - 110					07/24/17 12:10	08/03/17 09:24	1

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.11		0.261	0.280	1.00	0.304	pCi/L	07/24/17 12:10	08/03/17 09:24	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	99.7		40 - 110					07/24/17 12:10	08/03/17 09:24	1
Y Carrier	94.5		40 - 110					07/24/17 12:10	08/03/17 09:24	1

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0532	U	0.149	0.149	1.00	0.283	pCi/L	07/24/17 12:10	08/03/17 09:24	1
<b>Carrier</b>	<b>%Yield</b>	<b>Qualifier</b>	<b>Limits</b>					<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
Ba Carrier	97.1		40 - 110					07/24/17 12:10	08/03/17 09:24	1
Y Carrier	93.2		40 - 110					07/24/17 12:10	08/03/17 09:24	1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.68		0.294	0.319	5.00	0.295	pCi/L		08/15/17 14:52	1

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.09		0.238	0.253	5.00	0.251	pCi/L		08/15/17 14:52	1

**Client Sample ID: MW-13**  
**Date Collected: 07/17/17 13:40**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.603		0.208	0.211	5.00	0.277	pCi/L		08/15/17 14:52	1

TestAmerica Denver

# Client Sample Results

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

TestAmerica Job ID: 280-99315-1

## Method: Ra226\_Ra228 - Combined Radium-226 and Radium-228

**Client Sample ID: MW-10D**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.26		0.272	0.290	5.00	0.304	pCi/L		08/15/17 14:52	1

**Client Sample ID: MW-10EB**  
**Date Collected: 07/18/17 12:10**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-5**  
**Matrix: Water**

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0256	U	0.157	0.157	5.00	0.283	pCi/L		08/15/17 14:52	1



# QC Sample Results

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

TestAmerica Job ID: 280-99315-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 240-288420/1-A**  
**Matrix: Water**  
**Analysis Batch: 288623**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 288420**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		0.20	0.0081	mg/L		07/24/17 14:00	07/25/17 13:33	1

**Lab Sample ID: LCS 240-288420/2-A**  
**Matrix: Water**  
**Analysis Batch: 288623**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 288420**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	1.00	1.01		mg/L		101	80 - 120

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

**Lab Sample ID: MB 240-288420/1-A**  
**Matrix: Water**  
**Analysis Batch: 288707**

**Client Sample ID: Method Blank**  
**Prep Type: Total Recoverable**  
**Prep Batch: 288420**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		0.0020	0.00057	mg/L		07/24/17 14:00	07/25/17 18:54	1
Arsenic	ND		0.0050	0.00075	mg/L		07/24/17 14:00	07/25/17 18:54	1
Barium	ND		0.0050	0.0022	mg/L		07/24/17 14:00	07/25/17 18:54	1
Beryllium	ND		0.0010	0.00031	mg/L		07/24/17 14:00	07/25/17 18:54	1
Cadmium	ND		0.0010	0.00021	mg/L		07/24/17 14:00	07/25/17 18:54	1
Calcium	ND		1.0	0.58	mg/L		07/24/17 14:00	07/25/17 18:54	1
Chromium	ND		0.0020	0.00098	mg/L		07/24/17 14:00	07/25/17 18:54	1
Cobalt	ND		0.0010	0.00019	mg/L		07/24/17 14:00	07/25/17 18:54	1
Lead	ND		0.0010	0.00045	mg/L		07/24/17 14:00	07/25/17 18:54	1
Lithium	ND		0.0080	0.0017	mg/L		07/24/17 14:00	07/25/17 18:54	1
Molybdenum	ND		0.010	0.0011	mg/L		07/24/17 14:00	07/25/17 18:54	1
Selenium	ND		0.0050	0.00089	mg/L		07/24/17 14:00	07/25/17 18:54	1
Thallium	ND		0.0010	0.00020	mg/L		07/24/17 14:00	07/25/17 18:54	1

**Lab Sample ID: LCS 240-288420/3-A**  
**Matrix: Water**  
**Analysis Batch: 288707**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total Recoverable**  
**Prep Batch: 288420**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	0.100	0.0954		mg/L		95	80 - 120
Arsenic	1.00	1.00		mg/L		100	80 - 120
Barium	1.00	1.05		mg/L		105	80 - 120
Beryllium	1.00	1.06		mg/L		106	80 - 120
Cadmium	1.00	1.04		mg/L		104	80 - 120
Calcium	10.0	10.1		mg/L		101	80 - 120
Chromium	1.00	1.01		mg/L		101	80 - 120
Cobalt	1.00	1.00		mg/L		100	80 - 120
Lead	1.00	1.01		mg/L		101	80 - 120
Lithium	0.100	0.103		mg/L		103	80 - 120
Molybdenum	0.100	0.0948		mg/L		95	80 - 120
Selenium	1.00	1.00		mg/L		100	80 - 120
Thallium	0.250	0.246		mg/L		99	80 - 120

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-99315-1

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-381747/1-A**  
**Matrix: Water**  
**Analysis Batch: 381886**

**Client Sample ID: Method Blank**  
**Prep Type: Total/NA**  
**Prep Batch: 381747**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.00020	0.000027	mg/L		07/24/17 11:34	07/24/17 15:09	1

**Lab Sample ID: LCS 280-381747/2-A**  
**Matrix: Water**  
**Analysis Batch: 381886**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 381747**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.00500	0.00500		mg/L		100	84 - 120

**Lab Sample ID: LCSD 280-381747/3-A**  
**Matrix: Water**  
**Analysis Batch: 381886**

**Client Sample ID: Lab Control Sample Dup**  
**Prep Type: Total/NA**  
**Prep Batch: 381747**

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Mercury	0.00500	0.00497		mg/L		99	84 - 120	0	15

## Method: 9040B - pH

**Lab Sample ID: LCS 280-381394/29**  
**Matrix: Water**  
**Analysis Batch: 381394**

**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 280-381394/4**  
**Matrix: Water**  
**Analysis Batch: 381394**

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

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

**Lab Sample ID: 280-99315-4 DU**  
**Matrix: Water**  
**Analysis Batch: 381394**

**Client Sample ID: MW-10D**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	Limit
pH adj. to 25 deg C	8.5	HF	8.6		SU		2	5
Temperature	24.4	HF	24.6		Degrees C		0.6	10

**Lab Sample ID: LCS 280-383027/4**  
**Matrix: Water**  
**Analysis Batch: 383027**

**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

TestAmerica Denver



# QC Sample Results

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

TestAmerica Job ID: 280-99315-1

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-382750/6**  
**Matrix: Water**  
**Analysis Batch: 382750**

**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			08/01/17 10:20	1
Fluoride	ND		0.50	0.060	mg/L			08/01/17 10:20	1
Sulfate	0.416	J	5.0	0.23	mg/L			08/01/17 10:20	1

**Lab Sample ID: LCS 280-382750/4**  
**Matrix: Water**  
**Analysis Batch: 382750**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chloride	100	103		mg/L		103	90 - 110
Fluoride	5.00	5.27		mg/L		105	90 - 110
Sulfate	100	104		mg/L		104	90 - 110

**Lab Sample ID: LCSD 280-382750/5**  
**Matrix: Water**  
**Analysis Batch: 382750**

**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	103		mg/L		103	90 - 110	0	10
Fluoride	5.00	5.27		mg/L		105	90 - 110	0	10
Sulfate	100	104		mg/L		104	90 - 110	0	10

**Lab Sample ID: MRL 280-382750/3**  
**Matrix: Water**  
**Analysis Batch: 382750**

**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	0.189	J	mg/L		94	50 - 150
Sulfate	2.50	2.82	J	mg/L		113	50 - 150

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

**Lab Sample ID: MB 280-381723/1**  
**Matrix: Water**  
**Analysis Batch: 381723**

**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			07/24/17 08:10	1

**Lab Sample ID: LCS 280-381723/2**  
**Matrix: Water**  
**Analysis Batch: 381723**

**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	484		mg/L		97	86 - 110

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-99315-1

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

Lab Sample ID: MB 280-381513/2  
Matrix: Water  
Analysis Batch: 381513

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			07/20/17 18:20	1

Lab Sample ID: LCS 280-381513/1  
Matrix: Water  
Analysis Batch: 381513

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	101		mg/L		101	86 - 114

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

Lab Sample ID: MB 160-318910/1-A  
Matrix: Water  
Analysis Batch: 322165

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 318910

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.003265	U	0.0361	0.0361	1.00	0.0770	pCi/L	07/24/17 10:50	08/15/17 06:38	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.4		40 - 110					07/24/17 10:50	08/15/17 06:38	1

Lab Sample ID: LCS 160-318910/2-A  
Matrix: Water  
Analysis Batch: 322165

Client Sample ID: Lab Control Sample  
Prep Type: Total/NA  
Prep Batch: 318910

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	11.4	9.000		0.940	1.00	0.0869	pCi/L	79	68 - 137
Carrier	LCS %Yield	LCS Qualifier	Limits						
Ba Carrier	102		40 - 110						

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

Lab Sample ID: MB 160-318919/1-A  
Matrix: Water  
Analysis Batch: 320545

Client Sample ID: Method Blank  
Prep Type: Total/NA  
Prep Batch: 318919

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1909	U	0.187	0.188	1.00	0.303	pCi/L	07/24/17 12:10	08/03/17 09:23	1
Carrier	MB %Yield	MB Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.4		40 - 110					07/24/17 12:10	08/03/17 09:23	1
Y Carrier	92.9		40 - 110					07/24/17 12:10	08/03/17 09:23	1

TestAmerica Denver

# QC Sample Results

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

TestAmerica Job ID: 280-99315-1

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

**Lab Sample ID: LCS 160-318919/2-A**  
**Matrix: Water**  
**Analysis Batch: 320545**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Total/NA**  
**Prep Batch: 318919**

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-228	13.1	13.98		1.47	1.00	0.265	pCi/L	107	56 - 140

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	102		40 - 110
Y Carrier	93.6		40 - 110

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

# QC Association Summary

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

TestAmerica Job ID: 280-99315-1

## Metals

### Prep Batch: 288420

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total Recoverable	Water	3005A	
280-99315-2	MW-10	Total Recoverable	Water	3005A	
280-99315-3	MW-13	Total Recoverable	Water	3005A	
280-99315-4	MW-10D	Total Recoverable	Water	3005A	
280-99315-5	MW-10EB	Total Recoverable	Water	3005A	
MB 240-288420/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-288420/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCS 240-288420/3-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 288623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total Recoverable	Water	6010C	288420
280-99315-2	MW-10	Total Recoverable	Water	6010C	288420
280-99315-3	MW-13	Total Recoverable	Water	6010C	288420
280-99315-4	MW-10D	Total Recoverable	Water	6010C	288420
280-99315-5	MW-10EB	Total Recoverable	Water	6010C	288420
MB 240-288420/1-A	Method Blank	Total Recoverable	Water	6010C	288420
LCS 240-288420/2-A	Lab Control Sample	Total Recoverable	Water	6010C	288420

### Analysis Batch: 288707

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-2	MW-10	Total Recoverable	Water	6020A	288420
280-99315-3	MW-13	Total Recoverable	Water	6020A	288420
280-99315-4	MW-10D	Total Recoverable	Water	6020A	288420
280-99315-5	MW-10EB	Total Recoverable	Water	6020A	288420
MB 240-288420/1-A	Method Blank	Total Recoverable	Water	6020A	288420
LCS 240-288420/3-A	Lab Control Sample	Total Recoverable	Water	6020A	288420

### Analysis Batch: 288778

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total Recoverable	Water	6020A	288420

### Prep Batch: 381747

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	7470A	
280-99315-2	MW-10	Total/NA	Water	7470A	
280-99315-3	MW-13	Total/NA	Water	7470A	
280-99315-4	MW-10D	Total/NA	Water	7470A	
280-99315-5	MW-10EB	Total/NA	Water	7470A	
MB 280-381747/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-381747/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 280-381747/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

### Analysis Batch: 381886

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	7470A	381747
280-99315-2	MW-10	Total/NA	Water	7470A	381747
280-99315-3	MW-13	Total/NA	Water	7470A	381747
280-99315-4	MW-10D	Total/NA	Water	7470A	381747
280-99315-5	MW-10EB	Total/NA	Water	7470A	381747
MB 280-381747/1-A	Method Blank	Total/NA	Water	7470A	381747

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-99315-1

## Metals (Continued)

### Analysis Batch: 381886 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-381747/2-A	Lab Control Sample	Total/NA	Water	7470A	381747
LCSD 280-381747/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	381747

## General Chemistry

### Analysis Batch: 381394

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	9040B	
280-99315-2	MW-10	Total/NA	Water	9040B	
280-99315-3	MW-13	Total/NA	Water	9040B	
280-99315-4	MW-10D	Total/NA	Water	9040B	
LCS 280-381394/29	Lab Control Sample	Total/NA	Water	9040B	
LCS 280-381394/4	Lab Control Sample	Total/NA	Water	9040B	
280-99315-4 DU	MW-10D	Total/NA	Water	9040B	

### Analysis Batch: 381513

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	SM 2540D	
280-99315-2	MW-10	Total/NA	Water	SM 2540D	
280-99315-3	MW-13	Total/NA	Water	SM 2540D	
280-99315-4	MW-10D	Total/NA	Water	SM 2540D	
280-99315-5	MW-10EB	Total/NA	Water	SM 2540D	
MB 280-381513/2	Method Blank	Total/NA	Water	SM 2540D	
LCS 280-381513/1	Lab Control Sample	Total/NA	Water	SM 2540D	

### Analysis Batch: 381723

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	SM 2540C	
280-99315-2	MW-10	Total/NA	Water	SM 2540C	
280-99315-3	MW-13	Total/NA	Water	SM 2540C	
280-99315-4	MW-10D	Total/NA	Water	SM 2540C	
280-99315-5	MW-10EB	Total/NA	Water	SM 2540C	
MB 280-381723/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-381723/2	Lab Control Sample	Total/NA	Water	SM 2540C	

### Analysis Batch: 382750

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	9056A	
280-99315-1	MW-7	Total/NA	Water	9056A	
280-99315-2	MW-10	Total/NA	Water	9056A	
280-99315-2	MW-10	Total/NA	Water	9056A	
280-99315-3	MW-13	Total/NA	Water	9056A	
280-99315-4	MW-10D	Total/NA	Water	9056A	
280-99315-4	MW-10D	Total/NA	Water	9056A	
280-99315-5	MW-10EB	Total/NA	Water	9056A	
MB 280-382750/6	Method Blank	Total/NA	Water	9056A	
LCS 280-382750/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-382750/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-382750/3	Lab Control Sample	Total/NA	Water	9056A	

TestAmerica Denver

# QC Association Summary

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

TestAmerica Job ID: 280-99315-1

## General Chemistry (Continued)

### Analysis Batch: 383027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-5	MW-10EB	Total/NA	Water	9040B	
LCS 280-383027/4	Lab Control Sample	Total/NA	Water	9040B	

## Rad

### Prep Batch: 318910

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	PrecSep-21	
280-99315-2	MW-10	Total/NA	Water	PrecSep-21	
280-99315-3	MW-13	Total/NA	Water	PrecSep-21	
280-99315-4	MW-10D	Total/NA	Water	PrecSep-21	
280-99315-5	MW-10EB	Total/NA	Water	PrecSep-21	
MB 160-318910/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-318910/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### Prep Batch: 318919

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-99315-1	MW-7	Total/NA	Water	PrecSep_0	
280-99315-2	MW-10	Total/NA	Water	PrecSep_0	
280-99315-3	MW-13	Total/NA	Water	PrecSep_0	
280-99315-4	MW-10D	Total/NA	Water	PrecSep_0	
280-99315-5	MW-10EB	Total/NA	Water	PrecSep_0	
MB 160-318919/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-318919/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	

# Lab Chronicle

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

TestAmerica Job ID: 280-99315-1

**Client Sample ID: MW-7**  
**Date Collected: 07/17/17 12:00**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-1**  
**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	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			288623	07/25/17 15:59	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			288778	07/26/17 12:31	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	381747	07/24/17 11:34	CDH	TAL DEN
Total/NA	Analysis	7470A		1			381886	07/24/17 16:06	CDH	TAL DEN
Total/NA	Analysis	9040B		1			381394	07/19/17 17:56	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	382750	08/01/17 10:46	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	382750	08/01/17 12:41	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	381723	07/24/17 08:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	381513	07/20/17 18:20	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.57 mL	1.0 g	318910	07/24/17 10:50	LDE	TAL SL
Total/NA	Analysis	9315		1			322166	08/15/17 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.57 mL	1.0 g	318919	07/24/17 12:10	LDE	TAL SL
Total/NA	Analysis	9320		1			320545	08/03/17 09:24	ALD	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			322313	08/15/17 14:52	RTM	TAL SL

**Client Sample ID: MW-10**  
**Date Collected: 07/18/17 11:35**  
**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-2**  
**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	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			288623	07/25/17 16:03	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			288707	07/25/17 19:26	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	381747	07/24/17 11:34	CDH	TAL DEN
Total/NA	Analysis	7470A		1			381886	07/24/17 16:09	CDH	TAL DEN
Total/NA	Analysis	9040B		1			381394	07/19/17 17:51	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	382750	08/01/17 11:03	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	382750	08/01/17 12:58	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	381723	07/24/17 08:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	381513	07/20/17 18:20	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.08 mL	1.0 g	318910	07/24/17 10:50	LDE	TAL SL
Total/NA	Analysis	9315		1			322166	08/15/17 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.08 mL	1.0 g	318919	07/24/17 12:10	LDE	TAL SL
Total/NA	Analysis	9320		1			320545	08/03/17 09:24	ALD	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			322313	08/15/17 14:52	RTM	TAL SL

TestAmerica Denver



# Lab Chronicle

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

TestAmerica Job ID: 280-99315-1

**Client Sample ID: MW-13**

**Date Collected: 07/17/17 13:40**

**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-3**

**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	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			288623	07/25/17 16:08	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			288707	07/25/17 19:30	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	381747	07/24/17 11:34	CDH	TAL DEN
Total/NA	Analysis	7470A		1			381886	07/24/17 16:11	CDH	TAL DEN
Total/NA	Analysis	9040B		1			381394	07/19/17 18:01	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	382750	08/01/17 11:20	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	381723	07/24/17 08:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	381513	07/20/17 18:20	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.93 mL	1.0 g	318910	07/24/17 10:50	LDE	TAL SL
Total/NA	Analysis	9315		1			322166	08/15/17 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.93 mL	1.0 g	318919	07/24/17 12:10	LDE	TAL SL
Total/NA	Analysis	9320		1			320545	08/03/17 09:24	ALD	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			322313	08/15/17 14:52	RTM	TAL SL

**Client Sample ID: MW-10D**

**Date Collected: 07/18/17 11:35**

**Date Received: 07/18/17 12:50**

**Lab Sample ID: 280-99315-4**

**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	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			288623	07/25/17 16:13	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			288707	07/25/17 19:42	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	381747	07/24/17 11:34	CDH	TAL DEN
Total/NA	Analysis	7470A		1			381886	07/24/17 16:13	CDH	TAL DEN
Total/NA	Analysis	9040B		1			381394	07/19/17 18:27	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	382750	08/01/17 11:37	AFB	TAL DEN
Total/NA	Analysis	9056A		10	5 mL	5 mL	382750	08/01/17 13:14	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	381723	07/24/17 08:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	381513	07/20/17 18:20	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.08 mL	1.0 g	318910	07/24/17 10:50	LDE	TAL SL
Total/NA	Analysis	9315		1			322166	08/15/17 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.08 mL	1.0 g	318919	07/24/17 12:10	LDE	TAL SL
Total/NA	Analysis	9320		1			320545	08/03/17 09:24	ALD	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			322313	08/15/17 14:52	RTM	TAL SL

TestAmerica Denver

# Lab Chronicle

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

TestAmerica Job ID: 280-99315-1

**Client Sample ID: MW-10EB**

**Lab Sample ID: 280-99315-5**

**Date Collected: 07/18/17 12:10**

**Matrix: Water**

**Date Received: 07/18/17 12:50**

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	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6010C		1			288623	07/25/17 16:18	KLC	TAL CAN
Total Recoverable	Prep	3005A			50 mL	50 mL	288420	07/24/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020A		1			288707	07/25/17 19:46	AS1	TAL CAN
Total/NA	Prep	7470A			30 mL	50 mL	381747	07/24/17 11:34	CDH	TAL DEN
Total/NA	Analysis	7470A		1			381886	07/24/17 16:15	CDH	TAL DEN
Total/NA	Analysis	9040B		1			383027	08/02/17 14:32	A1D	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	382750	08/01/17 11:53	AFB	TAL DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	381723	07/24/17 08:10	JAP	TAL DEN
Total/NA	Analysis	SM 2540D		1	250 mL	250 mL	381513	07/20/17 18:20	SVC	TAL DEN
Total/NA	Prep	PrecSep-21			1000.43 mL	1.0 g	318910	07/24/17 10:50	LDE	TAL SL
Total/NA	Analysis	9315		1			322166	08/15/17 06:41	CDR	TAL SL
Total/NA	Prep	PrecSep_0			1000.43 mL	1.0 g	318919	07/24/17 12:10	LDE	TAL SL
Total/NA	Analysis	9320		1			320545	08/03/17 09:24	ALD	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			322313	08/15/17 14:52	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: 280-99315-1

## 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	01-08-18

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	02-23-18
Connecticut	State Program	1	PH-0590	12-31-17 *
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18
Kentucky (WW)	State Program	4	98016	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
Minnesota (Petrofund)	State Program	1	3506	07-31-17 *
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	09-14-17 *
Oregon	NELAP	10	4062	02-23-18
Pennsylvania	NELAP	3	68-00340	08-31-17 *
Texas	NELAP	6	T104704517-15-5	08-31-17 *
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-17 *
Washington	State Program	10	C971	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *
Wisconsin	State Program	5	999518190	08-31-17 *

## 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
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	11-30-17
Iowa	State Program	7	373	02-01-18
Kansas	NELAP	7	E-10236	10-31-17 *
Kentucky (DW)	State Program	4	90125	12-31-17
L-A-B	DoD ELAP		L2305	04-06-19
Louisiana	NELAP	6	04080	06-30-18
Louisiana (DW)	NELAP	6	LA170011	12-31-17
Maryland	State Program	3	310	09-30-18
Missouri	State Program	7	780	06-30-18
Nevada	State Program	9	MO000542017-1	07-31-18
New Jersey	NELAP	2	MO002	06-30-18

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

# Accreditation/Certification Summary

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

TestAmerica Job ID: 280-99315-1

## 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 York	NELAP	2	11616	03-31-18
North Dakota	State Program	8	R207	06-30-17 *
NRC	NRC		24-24817-01	12-31-22
Oklahoma	State Program	6	9997	08-31-17 *
Pennsylvania	NELAP	3	68-00540	02-21-18
South Carolina	State Program	4	85002001	06-30-17 *
Texas	NELAP	6	T104704193-17-11	07-31-18
US Fish & Wildlife	Federal		LE058448-0	10-31-17
USDA	Federal		P330-17-0028	02-02-20
Utah	NELAP	8	MO000542016-8	07-31-17 *
Virginia	NELAP	3	460230	06-14-18
Washington	State Program	10	C592	08-30-17 *
West Virginia DEP	State Program	3	381	08-31-17 *

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

TestAmerica Denver

**Chain of Custody Record**

<b>Client Information</b>		Lab PM: <u>Rothmeyer, Stephanie K</u>		COC No: <u>001</u>	
Client Contact: <u>Anna Lundin</u>		E-Mail: <u>stephanie.rothmeyer@testamericainc.com</u>		Page: <u>1</u> of <u>1</u>	
Company: <u>HDR Inc</u>		Sampler: <u>Justin Bills</u>		Job #: _____	
Address: <u>9781 S. Meridian Blvd Suite 400</u>		Phone: <u>518-331-7027</u>		Carrier Tracking No(s): _____	
City: <u>Englewood</u>		Due Date Requested: _____		Barcode: 	
State/Zip: <u>CO, 80112</u>		TAT Requested (days): <u>Standard</u>		280-99315 Chain of Custody	
Phone: <u>720-633-2380(Tel)</u>		PO #: <u>DEN-001</u>		Requested	
Email: <u>anna.lundin@hdrinc.com</u>		WO #: _____		Preservation Codes: M - Hexane N - None O - AshNaO2 P - Na2O4S R - Na2SO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Project Name: <u>Xcel Energy GW CCR Monitoring - Cherokee</u>		Project #: <u>28014371</u>		Other: _____	
Site: <u>Colorado</u>		SSOW#: _____		Special Instructions/Note: _____	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=soil, G=grab)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	2540C - Total Dissolved Solids (TDS)	PH - 9040B, Anions - 9056A, 280	2540D - Total Suspended Solids	9315, Ra226, 9320, Ra228	Total Number of Containers	Special Instructions/Note:
MW-7	7/17/17	1200	G	Water	N	N	12112				7	
MW-8				Water	N	N						
MW-9				Water	N	N						
MW-10	7/19/17	1135	G	Water	N	N	12112				7	
MW-13	7/17/17	1340	G	Water	N	N	12112				7	
Field Duplicate - MW-10D	7/19/17	1135	G	Water	N	N	12112				7	
Equipment Blank - MW-10FB	7/19/17	1210	G	Water	N	N	12112				7	

<b>Possible Hazard Identification</b> <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological	
Deliverable Requested: I, II, III, IV, Other (specify) _____	
Empty Kit Relinquished by: _____	Date: _____
Relinquished by: _____	Date/Time: <u>7/18/17 1250</u>
Relinquished by: _____	Date/Time: _____
Relinquished by: _____	Date/Time: _____
Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No	Custody Seal No.: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months
Special Instructions/IOC Requirements: _____
Method of Shipment: _____
Received by: _____ Date/Time: <u>7/16/17 1250</u> Company: <u>HDR</u>
Received by: _____ Date/Time: _____ Company: _____
Received by: _____ Date/Time: _____ Company: _____
Cooler Temperature(s) °C and Other Remarks: <u>8.9, 12.0 to 0.0 F, #7 transferred by JS 7/18/17</u>





# Chain of Custody Record



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Rothmeyer, Stephanie	C No: J0-406278.1							
Client Contact: TestAmerica Laboratories, Inc.		E-Mail: stephanie.rothmeyer@testamericainc.com	Page: Page 1 of 1							
Shipping/Receiving		Address: 13715 Rider Trail North, Earth City, MO, 63045	Job #: 280-99315-1							
Company: TestAmerica Laboratories, Inc.		Phone: 314-298-8566(Tel) 314-298-8757(Fax)	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:							
Address: 13715 Rider Trail North, Earth City, MO, 63045		Accreditations Required (See note): NELAP - Oregon	Analysis Requested							
City: Earth City		Due Date Requested: 8/16/2017	Total Number of containers							
State, Zip: MO, 63045		TAT Requested (days):								
Phone: 314-298-8566(Tel) 314-298-8757(Fax)		PO #:	9315_Ra226/PreSep_21 Radium-226 - 1/3 - SUB							
Email:		WO #:								
Project Name: Xcel Energy GW CCR Monitoring - Cherokee		Project #: 28014371	9320_Ra228/PreSep_0 Radium-228 - 2/3 - SUB							
Site: Xcel Energy CCR - Cherokee Station		SSOW#:								
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=wastewater, BT=BIOTISSUE, AS=AS)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Ra226Ra228_GFPCL (MOD) Local Method	9315_Ra226/PreSep_21 Radium-226 - 1/3 - SUB	9320_Ra228/PreSep_0 Radium-228 - 2/3 - SUB	Special Instructions/Note:
MW-7 (280-99315-1)	7/17/17	12:00 Mountain	Water	Water	X	X	X	X	X	2
MW-10 (280-99315-2)	7/18/17	11:35 Mountain	Water	Water	X	X	X	X	X	2
MW-13 (280-99315-3)	7/17/17	13:40 Mountain	Water	Water	X	X	X	X	X	2
MW-10D (280-99315-4)	7/18/17	11:35 Mountain	Water	Water	X	X	X	X	X	2
MW-10EB (280-99315-5)	7/18/17	12:10 Mountain	Water	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 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/less/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: \_\_\_\_\_ Method of Shipment: \_\_\_\_\_

Relinquished by: *Rothmeyer* Date/Time: 7/19/17 14:16 Company: TAP Company

Relinquished by: \_\_\_\_\_ Date/Time: 7/20/17 08:30 Company: TAP Company

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Custody Seals Intact: \_\_\_\_\_ Custody Seal No.: \_\_\_\_\_  
 Δ Yes Δ No

Cooler Temperature(s) °C and Other Remarks:



23.8/23.8

**Chain of Custody Record**



<b>Client Information (Sub Contract Lab)</b>		Lab PM: Rothmeyer, Stephanie K	Carrier Tracking No(s): 280-406279-1						
Client Contact: Shipping/Receiving		E-Mail: stephanie.rothmeyer@testamericainc.com	Page: Page 1 of 1						
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon	Job #: 280-99315-1						
Address: 4101 Shuffel Street NW, North Canton, OH, 44720		Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)							
Due Date Requested: 8/11/2017		Analysis Requested							
TAT Requested (days):		Total Number of Containers							
PO #:		Perform MS/MSD (Yes or No)							
WO #:		Field Filtered Sample (Yes or No)							
Project #: 28014371		6010C/3005A (MOD) Boron							
SSOW#:		6020A/3005A (MOD) 13 Metals							
Site: Xcel Energy CCR - Cherokee Station		Special Instructions/Note: 561							
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (Water, Solid, Divalent, Other)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of Containers	Special Instructions/Note
MW-7 (280-99315-1)	7/17/17	12:00 Mountain	Water	Water	X	X	1	Use Collision Cell	
MW-10 (280-99315-2)	7/18/17	11:35 Mountain	Water	Water	X	X	1	Use Collision Cell	
MW-13 (280-99315-3)	7/17/17	13:40 Mountain	Water	Water	X	X	1	Use Collision Cell	
MW-10D (280-99315-4)	7/18/17	11:35 Mountain	Water	Water	X	X	1	Use Collision Cell	
MW-10EB (280-99315-5)	7/18/17	12:10 Mountain	Water	Water	X	X	1	Use Collision Cell	

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon 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: \_\_\_\_\_ Date: \_\_\_\_\_

Relinquished by: *[Signature]* Date/Time: 7/19/17 14:20 Company: *[Signature]*

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date/Time: \_\_\_\_\_ Company: \_\_\_\_\_

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/QC Requirements: \_\_\_\_\_

Method of Shipment: \_\_\_\_\_

Received by: *[Signature]* Date/Time: 7/21/17 9:20 Company: *[Signature]*

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 Denver Site Name \_\_\_\_\_ Cooler unpacked by: [Signature]

Cooler Received on 7/2/17 Opened on 7/2/17

FedEx: 1<sup>st</sup> 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 -0.4 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °C  
 IR GUN #36 (CF +0°C) Observed Cooler Temp. 23.8 °C Corrected Cooler Temp. 23.8 °C

2. Were custody seals on the outside of the cooler(s)? If Yes Quantity \_\_\_\_\_  Yes No  
 -Were custody seals on the outside of the cooler(s) signed & dated?  Yes No NA  
 -Were custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?  Yes No

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 11-15 have been checked at the originating laboratory.

11. Were sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC697954

12. Were VOAs on the COC?  Yes No

13. Were air bubbles >6 mm in any VOA vials?  Yes No NA  ← Larger than this.

14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_  Yes No

15. 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): \_\_\_\_\_

## Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-99315-1

**Login Number: 99315**  
**List Number: 1**  
**Creator: True, Joshua A**

**List Source: TestAmerica Denver**

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

# Login Sample Receipt Checklist

Client: HDR Inc

Job Number: 280-99315-1

**Login Number: 99315**  
**List Number: 2**  
**Creator: Taylor, Kristene N**

**List Source: TestAmerica St. Louis**  
**List Creation: 07/20/17 04:41 PM**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	2.7
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	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: 280-99315-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)
280-99315-1	MW-7	96.2
280-99315-2	MW-10	101
280-99315-3	MW-13	99.1
280-99315-4	MW-10D	99.7
280-99315-5	MW-10EB	97.1
LCS 160-318910/2-A	Lab Control Sample	102
MB 160-318910/1-A	Method Blank	99.4

#### Tracer/Carrier Legend

Ba = Ba Carrier

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

Matrix: Water

Prep Type: Total/NA

### Percent Yield (Acceptance Limits)

Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
280-99315-1	MW-7	96.2	91.6
280-99315-2	MW-10	101	95.8
280-99315-3	MW-13	99.1	97.7
280-99315-4	MW-10D	99.7	94.5
280-99315-5	MW-10EB	97.1	93.2
LCS 160-318919/2-A	Lab Control Sample	102	93.6
MB 160-318919/1-A	Method Blank	99.4	92.9

#### Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier