

# 2022 Annual Groundwater Monitoring and Corrective Action Report AVS CCR Landfill

Antelope Valley Station Beulah, North Dakota

**Basin Electric Power Cooperative** 

Basin Electric Power Cooperative Bismarck, North Dakota

## Quality information

Prepared by	Check	ed by	Verified by		Approved by
Erin Doty	Jason	D. Lach	Dénnis P. Coni	nair, P.G.	Jeremy Hurshman, P.G.
Revision His	story				
Revision	Revision date	Details	Authorized	Name	Position
Distribution	List				
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Three	One	Kevin L. Solie,	P.E., Basin Electric Pow	ver Cooperative	)
-					-

Prepared for:

Basin Electric Power Cooperative Bismarck, North Dakota

Prepared by:

AECOM 525 Vine Street Suite 1800 Cincinnati, OH 45202 aecom.com

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#### **Table of Contents**

List c	of Acronyms	i
Exec	cutive Summary	ES-1
1.	Introduction	1-1
	Regulatory Background	1-1
	Facility Location and Operational History	1-1
	CCR Unit Description	1-1
	Physical Setting	1-1
2.	CCR Groundwater Monitoring Activity Prior to 2022	2-^
3.	CCR Groundwater Monitoring and Corrective Action Activities in 2022	3-^
	Detection Monitoring Activities	3-^
Moni	itoring System Evaluation	3-^
Grou	ındwater Sampling and Analysis	3-^
Statis	stical Procedures and Analysis	3-2
4.	General Information	4-
	Program Transitions 2022	4-
	Problems Encountered	4-
	Actions Planned for 2023	4-^
5.	Summary and Conclusions	5-^
6.	References	6-^

# **Figures**

- Figure 1 Site Location Map
- Figure 2 AVS CCR Monitoring Well Network As of December 2022
- Figure 3 Chloride Control Chart 2022

#### **Tables**

- Table 1 Statistical Analysis Methods and Background Upper Prediction Limits
- Table 2 Statistical Methods Analysis Results

#### **Attachments**

Attachment A – Sampling and Analysis Report, 2022, CCR Monitoring Program

Attachment B - Input Data Files for Calculation of Upper and Lower Prediction Limits (2016-2020)

# **List of Acronyms**

AECOM Technical Services, Inc.

AVS Antelope Valley Station

Basin Electric Power Cooperative

CCR Coal Combustion Residuals

FGD flue gas desulfurization

ft amsl feet above mean sea level

GWPSs groundwater protection standards

LPL lower prediction limit mg/L milligrams per liter

MW megawatt(s)

SAP Sampling and Analysis Plan

SSI statistically significant increase

UCL upper control limit

UPL upper prediction limit

USEPA United States Environmental Protection Agency

AECOM ii

# **Executive Summary**

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2022 at the Coal Combustion Residuals (CCR) Landfill at Antelope Valley Station (AVS), as required by 40 Code of Federal Regulations Section 257.90(e) of the United States Environmental Protection Agency CCR Rule. The location of the CCR unit and program monitoring network for the CCR unit, including supporting monitoring wells, are illustrated on **Figures 1** and **2**.

Detection-mode groundwater monitoring of the Landfill was initiated in 2018. Detection monitoring through October 2022 identified no statistically significant increases (SSIs) of Appendix III constituents (boron, calcium, chloride, fluoride, pH, sulfate, and total dissolved solids in the downgradient monitoring wells MW-15(S), MW-16(S), MW-17(S), and MW-20(S). Accordingly, the unit remains in detection monitoring into the next year.

Other activities and conditions for the 2022 annual reporting period include:

- Semiannual detection-mode groundwater monitoring events were conducted in July and October. Monitoring involved sampling of two background monitoring wells and four downgradient monitoring wells.
- Four Landfill expansion wells were installed in late 2020 north of the existing Landfill in preparation for Landfill
  expansion. Baseline groundwater monitoring events for these wells began in 2021. Five events were
  completed during the 2022 reporting period.
- No well repair or decommissioning of the existing program monitoring networks was conducted.
- No program transitions (detection to assessment or vice versa) were triggered.
- No programmatic problems were encountered so no remedies were required.

Anticipated activities for the next annual reporting period include:

- Completion of two semiannual detection-mode groundwater monitoring events.
- Incorporation of Landfill expansion wells into the AVS Landfill CCR monitoring program corresponding to the initial placement of CCR anticipated to begin in early 2023.
- Statistical evaluation of groundwater data for Appendix III constituents.

AECOM ES-1

### 1. Introduction

On behalf of Basin Electric Power Cooperative (Basin), AECOM Technical Services, Inc. (AECOM) has prepared the 2022 annual report documenting groundwater monitoring and corrective action for the Coal Combustion Residuals (CCR) Landfill at Basin's Antelope Valley Station (AVS).

Section 1 provides background information on the power generating facility, the CCR unit(s) present at the facility, and the physical setting of the CCR unit(s), specifically with regard to groundwater conditions. Section 2 summarizes CCR groundwater monitoring activities conducted prior to 2022. Section 3 summarizes the groundwater monitoring and corrective action activities completed in 2022, and references attachments to this report that contain detailed documentation of those activities. Section 4 provides general information including program transitions, problems encountered, and anticipated activities in 2023. Section 5 summarizes the report content. Section 6 lists references cited in this report.

# **Regulatory Background**

The CCR Rule, effective on October 19, 2015, established standards for the disposal of CCR in landfills and surface impoundments (CCR units). In particular, the rule set forth groundwater monitoring and corrective action requirements for CCR units. The Rule includes the requirement for an "annual groundwater monitoring and corrective action report" (annual report), submitted to the operating record annually on or before January 31. The annual report is intended to document the status of the groundwater monitoring and corrective action program for each CCR unit, summarize key actions completed in the previous year, and project key activities for the upcoming year. This report is the sixth annual report, and includes activities performed in calendar year 2022.

# **Facility Location and Operational History**

AVS is a coal-based generating station located north of Beulah, North Dakota (**Figure 1**). The plant consists of two power-generating units with a total power output capacity of 900 megawatts (MWs):

- Unit 1, with a rating of 450 MWs, which began operating in 1984; and
- Unit 2, with a rating of 450 MWs, which began operating in 1986.

CCR produced at AVS includes fly ash, bottom ash, and flue gas desulfurization (FGD) waste.

# **CCR Unit Description**

CCR is disposed of at AVS in the following CCR unit:

Section 7 Ash Landfill 0160 (Landfill).

The Landfill is located northeast of the generating units and office complex in an area of mine spoils identified as the Coteau Properties Freedom Mine (**Figure 1**). Basin reported that in 2022 the Landfill received approximately 551,000 cubic yards of solid waste, including fly ash, FGD waste, and a minor contribution of solid debris.

Expansion of the Landfill is underway with grading, liner placement, and expanded groundwater monitoring activities. Additional wells were installed in September 2020 and monitoring of baseline conditions was conducted in 2021 and 2022 as described in Section 2 below.

# **Physical Setting**

The geology underlying the site includes mine spoils underlain by the Sentinel Butte Formation. This formation is comprised of continental deposits more than 1,000-feet thick, consisting of dense clay, weakly cemented sandstone, mudstone, and lignite (coal).

AECOM 1-1

Precipitation supplies surface water to perennial and ephemeral streams that flow generally east toward the Beulah Trench then drain north towards Lake Sakakawea. Groundwater is recharged primarily through regional infiltration of melt water in the spring.

The base of the Landfill is underlain by 115 to 200 feet (approximately) of clay-rich mine spoil that overlies the Lower Sentinel Butte Formation. At the site, the Sentinel Butte is comprised primarily of dense clay with a trace of very fine sand and beds of lignite typically ranging from 6- to 9-feet thick. Monitoring well drilling activities to date have not penetrated to depths great enough to characterize the lower portions of the Sentinel Butte.

The uppermost aquifer is found within the 6- to 9-foot unmined lignite bed, mapped locally as the Spaer Bed or Spaer Lignite, located at depths ranging roughly from 180 to 260 feet below ground surface. The elevation of the Spaer Lignite varies across the site by approximately 35 feet from 1,844 feet above mean sea level (ft amsl) at MW-18s to 1,879 ft amsl at MW-23s. The potentiometric surface of the uppermost groundwater present within the Spaer is approximately 1,893 ft amsl in the western portion of the Landfill facility, sloping generally east to 1,880 ft amsl on the eastern side of the Landfill. Field hydraulic conductivity measurements from 2017 for the uppermost aquifer range from 1.65x10-4 centimeters per second in Well MW-19(S) to 2.48x10-9 centimeter per second in well MW-16(S).

AECOM 1-2

# 2. CCR Groundwater Monitoring Activity Prior to 2022

The regulatory process for CCR groundwater monitoring and corrective action is established by 40 Code of Federal Regulations Sections 257.90 through 257.98. The process includes a phased approach to groundwater monitoring and leading (if applicable), to the establishment of groundwater protection standards (GWPSs) for each CCR unit. Exceedances of the GWPSs that are determined to be statistically significant can trigger requirements for additional groundwater characterization and assessment of corrective measures followed by selection of remedy and remedy implementation.

The following paragraphs provide a summary of CCR groundwater monitoring activities performed prior to 2022. CCR groundwater monitoring activities performed between January and December 2022 are discussed in Section 3.

Groundwater monitoring at AVS is performed using a network of monitoring wells that includes wells to monitor background water quality that is not potentially influenced by the presence of the CCR unit, and wells placed at the downgradient boundary of the unit (**Figure 2**). The hydro-stratigraphic positions of the CCR monitoring wells selected for sampling background and downgradient groundwater quality for the Landfill are summarized below:

CCR Unit	Background Wells	Downgradient Wells
Active Landfill	MW-18(S), MW-19(S)	MW-15(S), MW-16(S), MW-17(S), MW-20(S)
Landfill Expansion Area	MW-21(S)	MW-22(S), MW-24(S)

Two other monitoring wells, MW-14(S) and MW-23(S) did not yield enough groundwater to obtain representative samples, so they have been excluded from groundwater monitoring. However, both remain in place for optional collection of groundwater level measurements for potential inclusion in the potentiometric evaluation of the Site.

Baseline monitoring initiated in August 2016 involved sampling groundwater for Part 257 Appendix III and Appendix IV constituents over eight baseline detection monitoring events.

The Landfill expansion area monitoring wells (MW-21(S), MW-23(S), and MW-24(S)) were installed between September 09 and September 24, 2020. Baseline monitoring of these new wells was initiated in the spring of 2021 for groundwater analysis of the CCR Rule Part 257 Appendix III and Appendix IV constituents. Three of the baseline monitoring events occurred during the 2021 reporting period with the remaining five events being completed in the 2022 reporting period. A review of preliminary findings from the baseline monitoring events is presented in Section 3.

Detection monitoring events prior to 2022 were performed in general accordance with procedures established in the site-specific Sampling and Analysis Plan (SAP) (AECOM 2018a), which is included in the facility's Operating Record. The SAP describes the procedures for equipment calibration, monitoring well water level measurement, monitoring well purging and sampling, sample custody, sample shipping, laboratory analysis, and documentation requirements for each groundwater sample submitted. The results of baseline monitoring and 2018 detection monitoring at the Landfill were presented and discussed in the First and Second Annual Groundwater Monitoring and Corrective Action Reports, respectively (AECOM 2018b, 2019). The Landfill was placed in detection monitoring in the winter of 2018 with the first detection monitoring groundwater sampling event completed in April 2018, then twice annually thereafter. The results of detection monitoring at the Landfill in 2018, 2019, 2020, and 2021 were presented and discussed in the previous Annual Groundwater Monitoring and Corrective Action Reports issued on January 31, 2019 (AECOM 2019); January 31, 2020 (AECOM 2020); January 31, 2021 (AECOM 2021); and January 31, 2022 (AECOM 2022b), respectively.

AECOM 2-1

# 3. CCR Groundwater Monitoring and Corrective Action Activities in 2022

This section summarizes the groundwater monitoring and corrective action conducted at the Landfill in 2022 to comply with the groundwater requirements of the CCR rule:

- Groundwater detection monitoring activities:
  - monitoring system evaluation completed in July and October 2022
  - groundwater sampling completed in July and October 2022
  - laboratory analysis of groundwater samples in July and October 2022
  - Statistical analysis of the monitoring results of the groundwater samples in July and October 2022
- Groundwater Corrective Action Not applicable
- Five baseline monitoring events of Landfill expansion wells were completed in March, May, July, August, and September 2022.

Further details concerning each of these activities, including a brief discussion of work completed during the reporting period are provided below.

# **Detection Monitoring Activities**

## **Monitoring System Evaluation**

As described in the CCR Groundwater Monitoring System Report (AECOM 2017), monitoring wells were installed around the CCR unit at the Landfill with appropriate total depth and placement of the well screen to: (1) facilitate collection of representative groundwater samples from the uppermost aquifer; and (2) accurately measure water table elevations to support evaluation of groundwater gradient and flow direction. All monitoring wells comprising the monitoring system were found to be in good condition during the detection monitoring events conducted in July and October 2022.

Potentiometric surface maps constructed using the depth-to-groundwater measurements obtained at the beginning of each event are presented in Attachment A. During the October event, water levels in the active Landfill wells were measured on October 25, 2022. The expansion wells were not measured the same day but were measured one week later on November 1, 2022. The direction of groundwater flow observed in both 2022 events was generally east across the active Landfill, which is consistent with the direction observed in previous years. Expansion wells to the north of the active Landfill cell show a groundwater flow direction to the northeast. The flow direction supports the designation of the wells noted in Section 2 above to represent background groundwater quality and the quality of groundwater downgradient of the unit.

# **Groundwater Sampling and Analysis**

The detection monitoring events were completed July and October of 2022 and included analysis of collected groundwater samples for the constituents listed in Part 257 Appendix III. Monitoring wells MW-15(S), MW-16(S), MW-17(S), MW-18(S), MW-19(S), and MW-20(S) were sampled as part of detection monitoring. The tabulated laboratory analytical results are presented in Attachment A, along with potentiometric surface maps for the uppermost aquifer, inferred groundwater flow direction and estimated groundwater flow velocities across the Landfill, and a tabulated summary of field water level measurements. Sampling and analysis were performed in general accordance with procedures established in the SAP, Revision 1 (AECOM 2022a).

AECOM 3-1

In addition to detection monitoring, baseline groundwater monitoring events for the expansion wells were conducted beginning in 2021 (May, July, and September) continuing into 2022 (March, May, July, August, and September). Each baseline event included the gauging of depth to water at each of the four wells installed to monitor the expansion area. Depth to water measurements reported measurable water in MW-21(s), MW-22(S) and MW-24(S) but no water in MW-23(S) during the baseline period. Following depth to water gauging, the groundwater in MW-21(S), MW-22(S), and MW-24(S) was purged and sampled for analysis of the constituents listed in Part 257 Appendix III and Appendix IV of the CCR Rule following the site's SAP, Revision 1 (AECOM 2022a). These eight sampling events conclude the baseline monitoring period for the expansion area. It is anticipated wells MW-21(S), MW-22(S), and MW-24(S) will be incorporated into the CCR monitoring program during the 2023 reporting period corresponding to the initiation of CCR placement in the expansion area.

#### **Statistical Procedures and Analysis**

The cumulative groundwater data collected for Appendix III indicator parameters at the Landfill were evaluated in accordance with the statistical procedures certified on October 17, 2017 (AECOM 2017). The data were evaluated using an interwell approach that statistically compares constituent concentrations at downgradient monitoring wells to those present at background monitoring wells. For the Landfill, monitoring wells MW-18(S) and MW-19(S) are designated as background wells because they are located upgradient of the Landfill, whereas the remaining monitoring wells MW-15(S), MW-16(S), MW-17(S), and MW-20(S) are located downgradient of the Landfill.

ProUCL Version 5.1 was selected for the development of site-specific background upper prediction limits (UPLs) with a 95-percent confidence for each Appendix III constituent utilizing monitoring well data from background monitoring wells collected between July 2016 and October 2020. The input file used for development of the UPLs is provided as Attachment B. A lower prediction limit (LPL) was also developed for pH which is a two-sided parameter. The concentrations of detected Appendix III constituents were entered as reported by the laboratory [non-detections set to Reporting Limit (RL)] and evaluated using ProUCL to determine if the population exhibited a normal, lognormal, or nonparametric distribution. One outlier for total dissolved solids was identified in the background data and removed from the prediction limit data set. Data from the downgradient monitoring wells for the 2022 sampling period were compared to the UPL to identify statistically significant increases (SSIs) over background. For statistical analysis comparing compliance well data to UPLs during the current reporting period, non-detect values were represented as one-half the method detection limit. The results of the analyses, including the UPLs, are provided in **Table 1**.

Chloride was evaluated using a control chart. An upper control limit (UCL) was developed as the mean +4.5 standard deviations using the chloride data for background monitoring wells MW-18(S) and MW-19(S). Starks (1988); U.S. Environmental Protection Agency (USEPA 2009), and ASTM (2017) suggest using 4.5 standard deviations to develop control limits for groundwater detection monitoring. **Figure 1** presents the control chart that shows the background mean (10.54 milligrams per liter [mg/L]); UCL (33.15) mg/L; and the baseline and detection monitoring results for downgradient compliance wells MW-15(S), MW-16(S), MW-17(S), and MW-20(S) through October 2022. The results depicted on **Figure 1** indicate that chloride does not exceed the UCL at any of the compliance monitoring wells for any sampling event. Therefore, chloride does not currently exhibit an SSI over background at any of the downgradient compliance wells.

The statistical analysis results indicate none of the Appendix III constituents had SSIs over background or statistically significant increasing trends in constituent concentrations as presented in **Table 2**. These statistical results are similar to the July 2022 results, with the exception of the subtraction of unverified SSIs of fluoride over background UPL in monitoring wells MW-15S, MW-17S, and MW-20S that were initially observed during the July 2022 event. Based on these results, assessment monitoring is not required at the AVS. Detection monitoring should continue at the site in 2023.

AECOM 3-2

# 4. General Information

The following subsections summarize any problems encountered in the Landfill program through 2022, any resolutions to those problems, if needed, and upcoming actions planned for 2023.

# **Program Transitions 2022**

There were no groundwater monitoring program transitions for the Landfill monitoring system during the January-December 2022 reporting period.

#### **Problems Encountered**

No problems were encountered during the January-December 2022 reporting period.

#### **Actions Planned for 2023**

Basin plans on continuing the detection monitoring program for the Landfill in 2023. The detection monitoring program will include semi-annual groundwater sampling events and the required statistical evaluations. Basin plans to incorporate the Landfill expansion wells into the CCR monitoring program for the Landfill during the 2023 reporting period at the commencement of placement of CCR waste into the expansion area.

AECOM 4-1

# 5. Summary and Conclusions

Basin conducted two rounds of CCR groundwater detection monitoring at the Landfill and five baseline monitoring events for newly installed wells in the Landfill expansion area between January and December 2022. The detection sampling results were used to establish background groundwater quality for Appendix III constituents in the uppermost aquifer, identify appropriate UPLs and LPLs, and determine whether any Appendix III constituents experienced SSIs downgradient of the CCR unit. The statistical analysis results indicate that none of the Appendix III constituents had SSIs over background or statistically significant increasing trends in constituent concentrations. Based on these results, Assessment monitoring is not required at the Landfill. Detection monitoring will continue at the site in 2023.

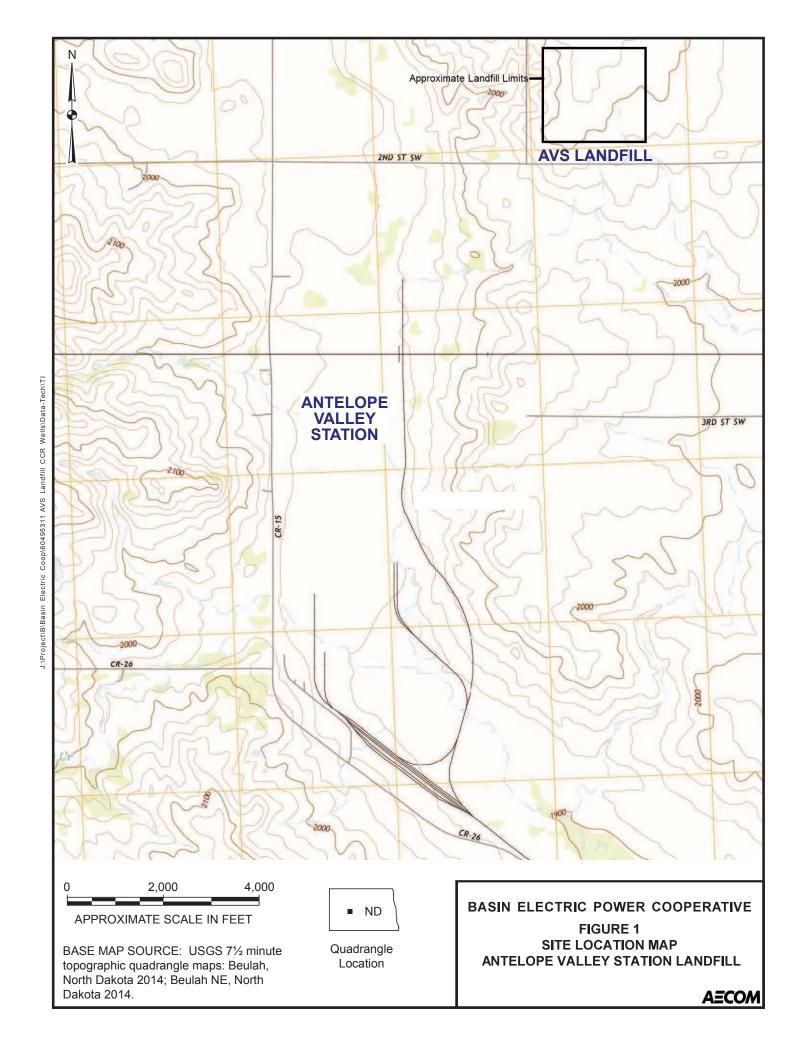
AECOM 5-1

### 6. References

- AECOM Technical Services, Inc. (AECOM). 2017. CCR Groundwater Monitoring System Report, Antelope Valley Station, Beulah, North Dakota. Basin Electric Power Cooperative. October 2017.
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- Starks, T. H. 1988. Evaluation of Control Chart Methodologies for Resource Conservation and Recovery Act (RCRA) Waste Sites, U.S. Environmental Protection Agency EPA/600/4-88/040. December. 40 pp.
- United States Environmental Protection Agency (USEPA). 2009. Statistical Analysis of Groundwater Monitoring Data at Resource Conservation and Recovery Act (RCRA) Facilities Unified Guidance. EPA 530-R-09-007. March 2009. 884 pp.

AECOM 6-1

# **Figures**



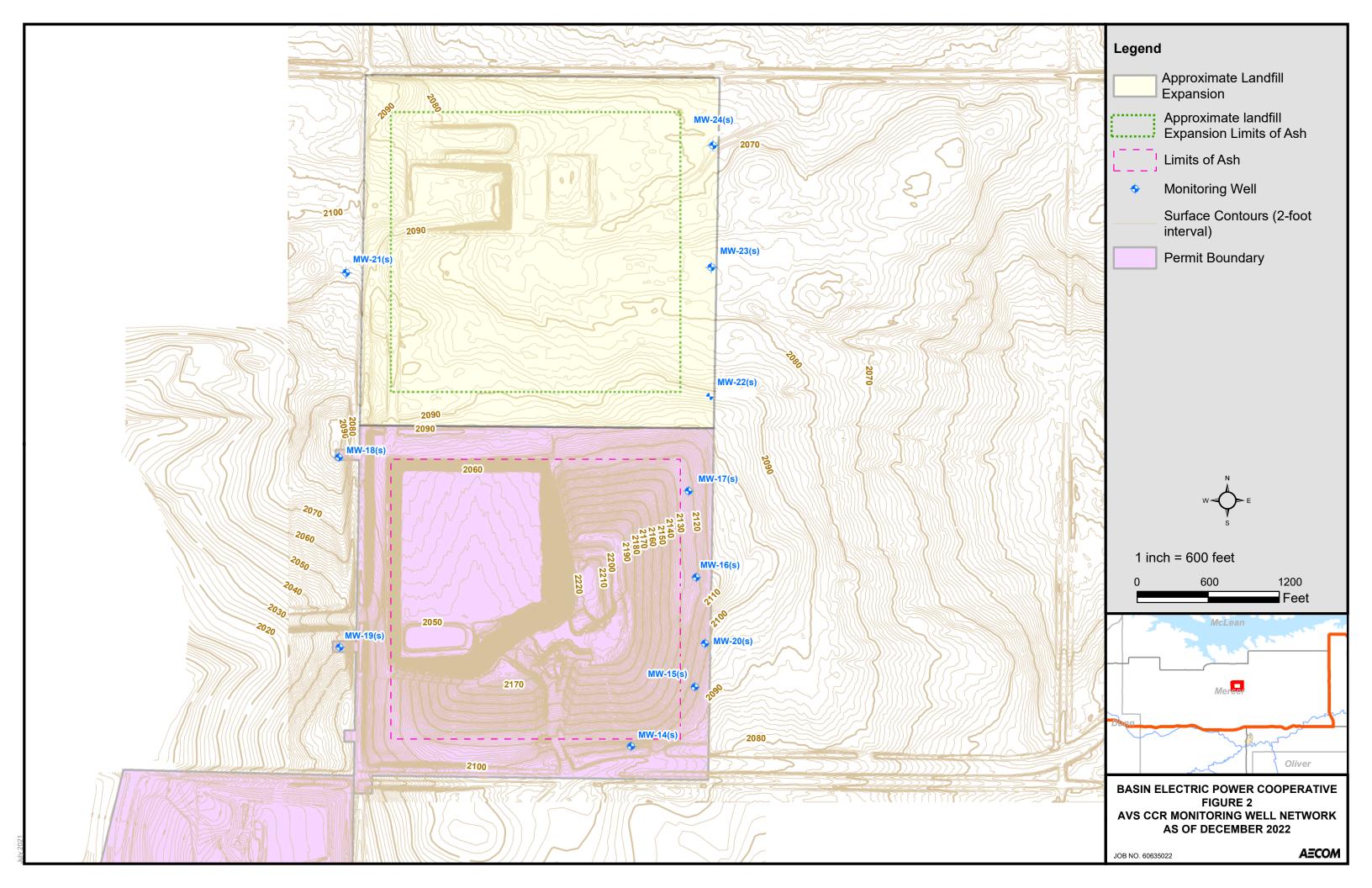
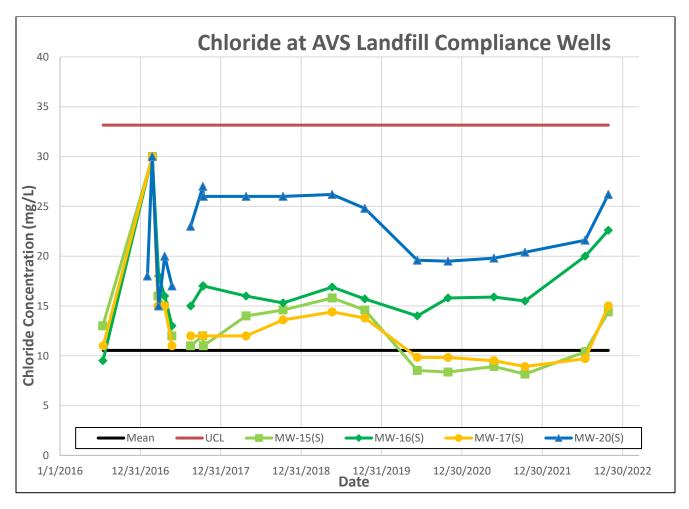


Figure 3. Chloride Control Chart 2022 Antelope Valley Station



# **Tables**

**Table 1. Statistical Analysis Methods and Background Upper Prediction Limits Antelope Valley Station** 

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Method	Background Prediction or Control Limit	
Boron (mg/L)	29	52	Yes/Yes	Parametric 95% UPL	0.2	
Calcium (mg/L)	29	0	No/No	Nonparametric 95% UPL	21	
Chloride (mg/L)	29	17	No/No	Control Chart 99.9% UCL	33.7	
Fluoride (mg/L)	29	17	No/No	Nonparametric 95% UPL	3.75	
pH (std units)	33	0	No/No	Nonparametric 95% UPL/LPL	9.99/7.37	
Sulfate (mg/L)	29	0	No/No	Nonparametric 95% UPL	703.5	
TDS (mg/L)	28	0	No/No	Nonparametric 95% UPL	2,154	

#### Notes:

pH has both an LPL and UPL; all other constituents only have an UPL or UCL mg/L= milligrams per liter

UCL = Upper Control Limit

LPL = Lower Prediction Limit

UPL = Upper Prediction Limit

**Table 2. Statistical Methods Analysis Results Antelope Valley Station** 

Well	Location	В	Са	CI	F	pH (LPL/UPL)	SO <sub>4</sub>	TDS
MW-15(S)	Downgradient							
MW-16(S)	Downgradient							
MW-17(S)	Downgradient							
MW-MW-20(S)	Downgradient							

#### Notes:

SSIs determined using interwell upper prediction limits (UPLs) at background monitoring well MW-18(S) and MW-19(S)

Less than or equal to background upper prediction limit (UPL) or greater than low er prediction limit (LPL) for pH Unverified statistically significant increase (SSI) over background UPL or below background LPL for pH Verified SSI over background UPL or below background LPL for pH

## **Attachment A**

# **Sampling and Analysis Report, 2022 CCR Monitoring Program**



# 2022 Sampling and Analysis Report AVS Landfill CCR Monitoring Program

Antelope Valley Station Beulah, North Dakota

**Basin Electric Power Cooperative** 

January 31, 2023

#### Prepared for:

Basin Electric Power Cooperative Bismarck, North Dakota

#### Prepared by:

AECOM 525 Vine Street Suite 1800 Cincinnati, OH 45202 aecom.com

Project 60635022

# **Table of Contents**

List of A	Acronyms	i
	Introduction	
1.	IIII Oddction	
2.	Groundwater Flow	. 3
3.	Groundwater Quality	. :

# **Figures**

Figure 1	Potentiometric Surface Map July 2022
Figure 2	Potentiometric Surface Map November 2022

## **Tables**

Table 1A	July 2022 Groundwater Monitoring Water Levels and Elevations
Table 1B	November 2022 Groundwater Monitoring Water Levels and Elevations
Table 2	Groundwater Gradient and Seepage Velocity Estimate
Table 3	2022 CCR Monitoring Network Analytical Results

# **Appendix**

Appendix I Laboratory Reports

# **List of Acronyms**

AECOM Technical Services, Inc.

AVS Antelope Valley Station

Basin Electric Power Cooperative

CCR Coal Combustion Residuals

CFR Code of Federal Regulations

EPA United States Environmental Protection Agency

#### 1. Introduction

On behalf of Basin Electric Power Cooperative (Basin), AECOM Technical Services, Inc. (AECOM) prepared this Coal Combustion Residuals (CCR) Groundwater Sampling and Analysis Report for the Basin Antelope Valley Station (AVS) CCR Landfill. The objective of the report is to provide a description of the field and office activities performed in 2022 in support of the AVS CCR Landfill groundwater monitoring program.

This Sampling and Analysis Report was prepared to present the results of sampling and analysis of groundwater conducted for the monitoring requirements of the United States Environmental Protection Agency (EPA) CCR rule (Chapter 40 of the Code of Federal Regulations [CFR], Sections 257.90 to 257.98). Specifically, the report presents the data collected for the two groundwater detection monitoring events conducted in 2022 and provides baseline monitoring data conducted in 2022 for landfill expansion preparation.

#### 2. Groundwater Flow

As required by 40 CFR Section 257.93(c), groundwater elevations were measured in each well prior to purging each time groundwater was sampled. The measurements, presented in **Tables 1A** and **1B**, were used to create potentiometric surface maps for the uppermost aquifer for the detection monitoring events. The resulting potentiometric surface maps were used to evaluate the direction and rate of groundwater flow across the CCR unit. **Figure 1** and **Figure 2** represent potentiometric surface maps constructed using measurements taken from July 12, 2022 and November 1, 2022, respectively. The maps show the inferred groundwater flow directions for the CCR unit and the approximate landfill expansion area to the north. These potentiometric maps illustrate groundwater flow patterns that are generally consistent with the patterns observed during previous monitoring events. Calculated groundwater flow velocities are summarized in **Table 2**.

Based on the groundwater flow conditions documented in this chapter, the relative function of the monitoring wells employed in the AVS CCR Landfill groundwater monitoring system and baseline monitoring landfill expansion wells are as follows:

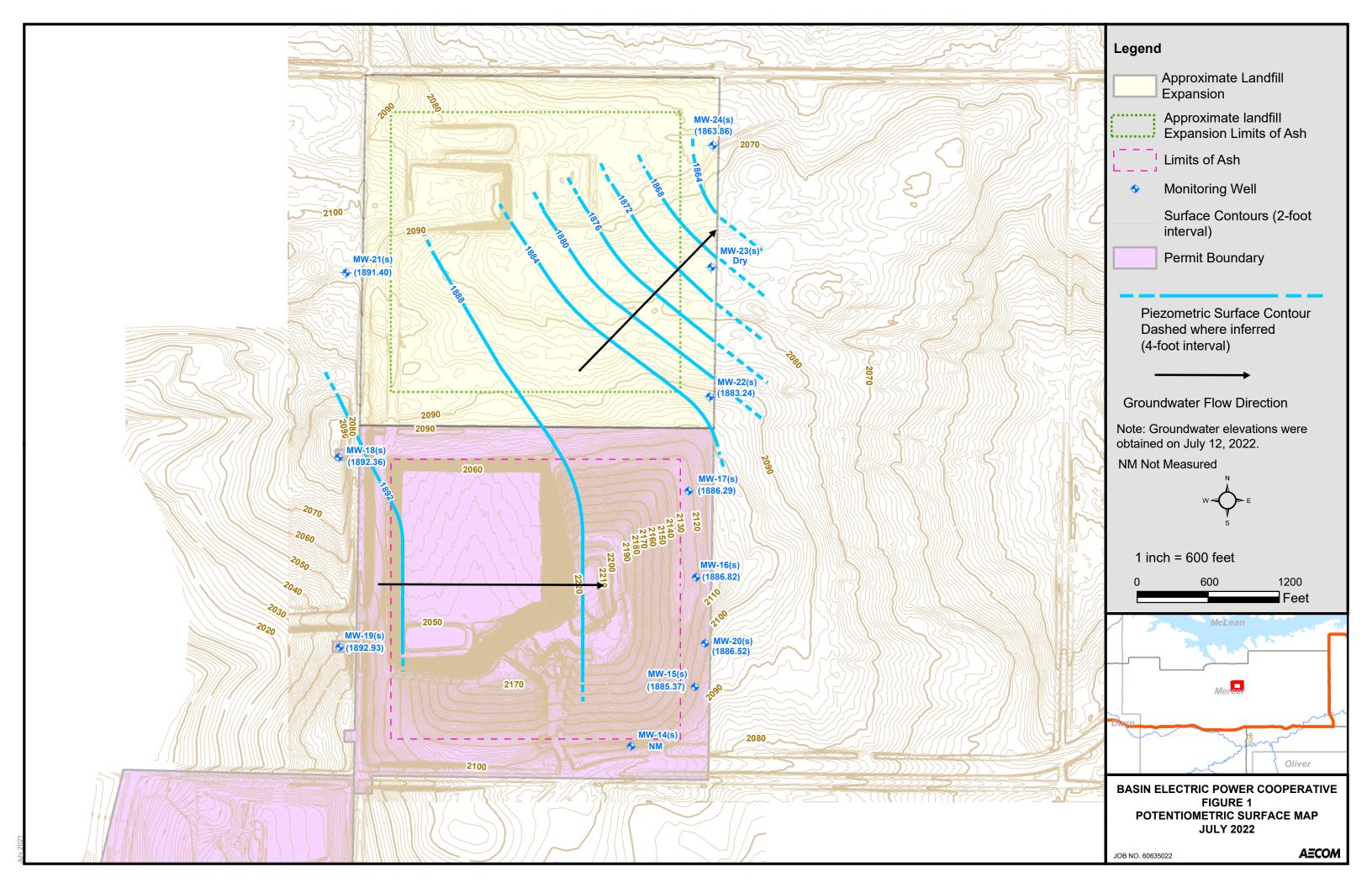
CCR unit	Background wells	Downgradient wells
Active Landfill	MW-18(S), MW-19(S)	MW15(S), MW-16(S), MW-17(S), MW-20(S)
Landfill Expansion Area	MW-21(S)	MW-22(S) and MW-24(S)

Monitoring well MW-14(S) is being excluded from the groundwater monitoring network due to insufficient water production to obtain a representative sample. However, it remains in place for optional collection of groundwater level measurements for potential use in potentiometric mapping as appropriate. Groundwater level measurements at MW-14(S) were not recorded in 2022. Monitoring well MW-23(S) is excluded from the baseline monitoring network, because it was dry during sampling events in 2021 and 2022.

# 3. Groundwater Quality

The analytical testing laboratory provided reports presenting the results of laboratory analysis for each detection monitoring event and expansion baseline monitoring event. These laboratory reports are included in the operating record, are presented in **Appendix I**, and were reviewed for completeness against the project-required methods and the chain-of-custody forms. Laboratory reports were also reviewed for holding times, and for appropriate flagging based on the quality assurance/quality control testing results provided by the laboratory. The results for the active landfill CCR unit were compiled into a summary form as presented in **Table 3**. Analytical results for the landfill expansion area are found in **Appendix I**.

# **Figures**



# **Tables**

Table 1A
Groundwater Depth And Elevation - July 2022
CCR Landfill Detection Program Groundwater Monitoring
Antelope Valley Station - Beulah, North Dakota

ACTIVE LANDFILL							
	Reference Elevation	July 12, 2022	Groundwater				
	Top of Casing	Depth to Water	Elevation				
Well ID	(feet, amsl)	(ft,btoiwc)	(ft, amsl)				
MW-14(s)	2093.41	Not Measured	Not Measured				
MW-15(s)	2104.77	219.40	1885.37				
MW-16(s)	2123.59	236.77	1886.82				
MW-17(s)	2124.89	238.60	1886.29				
MW-18(s)	2091.60	199.24	1892.36				
MW-19(s)	2042.56	149.63	1892.93				
MW-20(s)	2107.47	220.95	1886.52				
	LANDFILL EXPANSION A	REA (UNDER CONSTRUCT	ION)				
MW-21(s)	2094.72	203.32	1891.40				
MW-22(s)	2093.90	210.66	1883.24				
MW-23(s)	2080.16	Dry	Dry				
MW-24(s)	2070.74	206.88	1863.86				

ft btoiwc = feet, below top of inner well casing

ft amsl = feet, above mean sea level (Vertical Datum NGVD29)

60605022 1/13/2023

Table 1B
Groundwater Depth And Elevation - November 2022
CCR Landfill Detection Program Groundwater Monitoring
Antelope Valley Station - Beulah, North Dakota

	ACTIV	E LANDFILL	
	Reference Elevation	October 25, 2022	Groundwater
	Top of Casing	Depth to Water	Elevation
Well ID	(feet, amsl)	(ft btoiwc)	(ft, amsl)
MW-14(s)	2093.41	Not Measured	Not Measured
MW-15(s)	2104.77	219.42	1885.35
MW-16(s)	2123.59	236.91	1886.68
MW-17(s)	2124.89	238.50	1886.39
MW-18(s)	2091.60	199	1892.60
MW-19(s)	2042.56	149.42	1893.14
MW-20(s)	2107.47	221	1886.47
	LANDFILL EXPANSION A	REA (UNDER CONSTRUCT	TION)
		November 1, 2022	
MW-21(s)	2094.72	202.81	1891.91
MW-22(s)	2093.90	210.27	1883.63
MW-23(s)	2080.16	Dry (> 240 ft bgs)	Dry (> 240 ft bgs)
MW-24(s)	2070.74	206.85	1863.89

ft btoiwc = feet, below top of inner well casing ft amsl = feet, above mean sea level (Vertical Datum NGVD29)

60605022 1/13/2023

**TABLE 2** 

# GROUNDWATER GRADIENT AND SEEPAGE VELOCITY ESTIMATE CCR PROGRAM MONITORING WELLS ANTELOPE VALLEY STATION CCR LANDFILL – BEULAH, NORTH DAKOTA

Date of event	d <sub>i</sub> (ft)	d <sub>h</sub> (ft)	i (ft/ft)	n <sub>e</sub>	K (ft/day)	v <sub>s</sub> (ft/day)
7/13/2016	1050	3	2.86E-03	0.185	0.234	3.62E-03
2/22/2017	1140	3	2.63E-03	0.185	0.234	3.33E-03
3/21/2017	1020	2	1.96E-03	0.185	0.234	2.48E-03
4/19/2017	1050	3	2.86E-03	0.185	0.234	3.62E-03
5/23/2017	1230	3	2.44E-03	0.185	0.234	3.09E-03
6/28/2017	1020	3	2.94E-03	0.185	0.234	3.72E-03
7/24/2017	1110	3	2.70E-03	0.185	0.234	3.42E-03
8/16/2017	1410	3	2.13E-03	0.185	0.234	2.69E-03
4/25/2018	1260	3	2.38E-03	0.185	0.234	3.01E-03
10/10/2018	1245	3	2.41E-03	0.185	0.234	3.05E-03
5/21/2019	1425	3	2.11E-03	0.185	0.234	2.66E-03
10/16/2019	1500	3	2.00E-03	0.185	0.234	2.53E-03
6/10/2020	1170	2	1.71E-03	0.185	0.234	2.16E-03
10/27/2020	1110	2	1.80E-03	0.185	0.234	2.28E-03
5/24/2021	1600	4	2.5E-03	0.185	0.234	3.16E-03
10/11/2021	1650	4	2.4E-03	0.185	0.234	3.07E-03
7/12/2022	1500	4	2.67E-03	0.185	0.234	3.373E-03
11/1/2022	900	4	4.44E-03	0.185	0.234	5.622E-03

d<sub>I</sub> = Horizontal separation between upgradient and downgradient locations perpendicular to potentiometric contours

d<sub>h</sub> = Change in hydraulic head between upgradient and downgradient locations

i = Hydraulic gradient (change in elevation over distance)

 $n_e$  = Site average porosity of 18.5%

K = Site average hydraulic conductivity of 2.34 E-01 ft/day from slug and pumping tests at site

v<sub>s</sub> = Seepage Velocity (ft/day)

Hydraulic Gradient Governing Equation  $i=-\frac{dh}{dl}$ 

Seepage Velocity Governing Equation 2 –  $v_s = -K * i/n_e$ 

Table 3 2022 CCR Monitoring Network Analytical Results

			Appendix III Constituents						
Well ID	Event	Date	Boron (mg/L)	Calcium (mg/L)	Chloride (mg/L)	Fluoride (mg/L)	pH (S.U.)	Sulfate (mg/L)	Total Dissolved Solids (mg/L)
MW-15(S)		07/13/2022	0.147	5.37	10.4	4.44	8.29	402	1820
MW-16(S)	_	07/13/2022	0.188	2.21	20.0	1.72	8.14	77.0	816
MW-17(S)	July 2022	07/13/2022	0.147	3.88	9.71	4.24	7.92	257	1660
MW-18(S)	July 2022	07/13/2022	0.119	4.92	5.06	3.93	9.02	521	1680
MW-19(S) Dup	July 2022	07/13/2022	0.151	3.98	14.0	4.15	8.08	881	45500
MW-19(S)	July 2022	07/13/2022	0.157	3.99	13.8	4.15	8.08	892	2070
MW-20(S)	July 2022	07/13/2022	0.14	5.25	21.6	4.52	7.96	78.5	1790
MW-15(S)	October 2022	10/26/2022	0.10	4.27	14.4	1.41	8.05	404	1880
MW-16(S)	October 2022	10/26/2022	0.12	3.26	22.6	1.83	8.11	79.0	1180
MW-17(S)	October 2022	10/26/2022	< 0.1	3.59	15.0	1.38	8.01	247	1740
MW-18(S)	October 2022	10/26/2022	< 0.1	3.60	8.8	1.17	9.07	450	1730
MW-19(S) Dup	October 2022	10/26/2022	0.10	3.93	18.2	0.64	8.03	793	2190
MW-19(S)	October 2022	10/26/2022	0.10	3.97	18.2	0.64	8.03	785	2190
MW-20(S)	October 2022	10/26/2022	0.10	4.20	26.2	1.14	8.00	55.0	1800

Notes:

mg/L = milligrams per liter S.U. = Standard units

# **Appendix I: Laboratory Reports**

# **Environment Testing America**

# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-160139-1

Laboratory Sample Delivery Group: AVS Landfill

Client Project/Site: CCR Groundwater - North Dakota Sites -

**AVS Landfill** 

For:

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelly Twener

Authorized for release by: 4/22/2022 3:27:44 PM

Shelby Turner, Project Manager I (303)736-0100

Shelby.Turner@et.eurofinsus.com

..... LINKS .....

Review your project results through

Total Access

**Have a Question?** 



Visit us at:

www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	14
Chronicle	15
Certification Summary	16
Chain of Custody	17
Receipt Checklists	20
Tracer Carrier Summary	22

3

4

6

8

9

11

12

14

1

## **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1 SDG: AVS Landfill

#### **Qualifiers**

Rad

Qualifier Qualifier Description

U Result is less than the sample detection limit.

#### **Glossary**

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

Example 2 Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive
QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

**Eurofins Denver** 

#### Case Narrative

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS Landfill

Job ID: 280-160139-1 SDG: AVS Landfill

Job ID: 280-160139-1

**Laboratory: Eurofins Denver** 

Narrative

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - North Dakota Sites -AVS Landfill

Report Number: 280-160139-1

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.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

The samples were received on 3/24/2022 11:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3° C.

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 03/29/2022 and analyzed on 04/20/2022.

The following samples were prepared at a reduced aliquot due to matrix: MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4). A laboratory control sample (LCS) / laboratory control sample duplicate (LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

#### RADIUM-228

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 03/29/2022 and analyzed on 04/19/2022.

The following samples were prepared at a reduced aliquot due to matrix: MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4). A laboratory control sample (LCS) / laboratory control sample duplicate (LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

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

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 04/22/2022.

**Eurofins Denver** 

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS Landfill

Job ID: 280-160139-1 SDG: AVS Landfill

Job ID: 280-160139-1 (Continued)

**Laboratory: Eurofins Denver (Continued)** 

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: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

**Client Sample ID: MW-22S** Lab Sample ID: 280-160139-1

No Detections.

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2

No Detections.

Client Sample ID: MW-21S Lab Sample ID: 280-160139-3

No Detections.

Client Sample ID: DUP Lab Sample ID: 280-160139-4

No Detections.

Job ID: 280-160139-1 SDG: AVS Landfill

## **Method Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1

SDG: AVS Landfill

Method	Method Description	Protocol	Laboratory
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
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

#### **Protocol References:**

None = None

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

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

#### **Laboratory References:**

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

## **Sample Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-160139-1	MW-22S	Water	03/22/22 10:05	03/24/22 11:05
280-160139-2	MW-24S	Water	03/22/22 11:05	03/24/22 11:05
280-160139-3	MW-21S	Water	03/22/22 12:50	03/24/22 11:05
280-160139-4	DUP	Water	03/22/22 12:50	03/24/22 11:05

Job ID: 280-160139-1 SDG: AVS Landfill

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1

**Matrix: Water** 

03/29/22 13:42 04/20/22 14:25

Job ID: 280-160139-1 SDG: AVS Landfill

Date Collected: 03/22/22 10:05 Date Received: 03/24/22 11:05

Count Total

102

Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.117	U	0.293	0.293	1.00	0.621	pCi/L	03/29/22 13:42	04/20/22 14:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac

40 - 110

Lab Sample ID: 280-160139-2 **Client Sample ID: MW-24S** 

Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.352	U	0.298	0.300	1.00	0.450	pCi/L	03/29/22 13:42	04/20/22 14:25	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					03/29/22 13:42	04/20/22 14:25	1

**Client Sample ID: MW-21S** Lab Sample ID: 280-160139-3

Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0548	U	0.205	0.205	1.00	0.425	pCi/L	03/29/22 13:42	04/20/22 14:26	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.7		40 - 110					03/29/22 13:42	04/20/22 14:26	1

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4

Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: (	00/24/22 11:0	•	Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.116	U	0.205	0.205	1.00	0.360	pCi/L	03/29/22 13:42	04/20/22 14:27	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		40 - 110					03/29/22 13:42	04/20/22 14:27	1

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1

Date Collected: 03/22/22 10:05 Date Received: 03/24/22 11:05

		•							
			Count	Total					
			Uncert.	Uncert.					
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.233	U	0.375	0.375	1.00	0.719 pCi/L	03/29/22 14:17	04/19/22 12:32	1

**Eurofins Denver** 

**Matrix: Water** 

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

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

Carrier	%Yield Qualifier	Limits	Prepared Analyzed	Dil Fac
Ba Carrier	102	40 - 110	03/29/22 14:17 04/19/22 12:3	32 1
Y Carrier	82.2	40 - 110	03/29/22 14:17 04/19/22 12:	32 1

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.397	U	0.419	0.420	1.00	0.684	pCi/L	03/29/22 14:17	04/19/22 12:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	108		40 - 110					03/29/22 14:17	04/19/22 12:32	1
Y Carrier	82.6		40 - 110					03/29/22 14:17	04/19/22 12:32	1

**Client Sample ID: MW-21S** Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

Date Received: (			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.684		0.408	0.413	1.00	0.622	pCi/L	03/29/22 14:17	04/19/22 12:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	85.7		40 - 110					03/29/22 14:17	04/19/22 12:32	1
Y Carrier	83.4		40 - 110					03/29/22 14:17	04/19/22 12:32	1

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03	/24/22 11:0	5								
			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.865		0.354	0.363	1.00	0.493	pCi/L	03/29/22 14:17	04/19/22 12:32	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	89.1		40 - 110					03/29/22 14:17	04/19/22 12:32	1
Y Carrier	87.1		40 - 110					03/29/22 14:17	04/19/22 12:32	1

Method: Ra226 Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1 Date Collected: 03/22/22 10:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Date Neceived, 03/2	4/22 11.0	3								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.351	U	0.476	0.476	5.00	0.719	pCi/L		04/22/22 15:09	1

**Eurofins Denver** 

Job ID: 280-160139-1

SDG: AVS Landfill

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1

SDG: AVS Landfill

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

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 Date Collected: 03/22/22 11:05

**Matrix: Water** 

Date Received: 03/24/22 11:05

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.749		0.514	0.516	5.00	0.684	pCi/L		04/22/22 15:09	1

Lab Sample ID: 280-160139-3

**Matrix: Water** 

Date Collected: 03/22/22 12:50 Date Received: 03/24/22 11:05

Client Sample ID: MW-21S

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.629		0.457	0.461	5.00	0.622	pCi/L		04/22/22 15:09	1

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

Count Total Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac **Combined Radium** 0.409 0.417 5.00 0.493 pCi/L 04/22/22 15:09 0.980

226 + 228

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-557767/19-A

**Matrix: Water** 

Analysis Batch: 561497

Client Sample	ID: Method Blank
---------------	------------------

Prep Type: Total/NA

Prep Batch: 557767

Job ID: 280-160139-1 SDG: AVS Landfill

			Count	Total						
	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.004979	U	0.0906	0.0906	1.00	0.189	pCi/L	03/29/22 13:42	04/21/22 14:26	1
	МВ	MB								

**Spike** 

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 97.3 40 - 110 

Lab Sample ID: LCS 160-557767/1-A **Client Sample ID: Lab Control Sample** 

**Matrix: Water** 

Analysis Batch: 561270

Prep Type: Total/NA
<b>Prep Batch: 557767</b>

Total Uncert. %Rec RL **MDC** Unit Limits  $(2\sigma + / -)$ %Rec

Analyte Added Result Qual Radium-226 1.00 11.3 10.35 1.26 0.282 pCi/L 91 75 - 125

LCS LCS

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 90.9 40 - 110

Lab Sample ID: LCSD 160-557767/2-A **Client Sample ID: Lab Control Sample Dup** 

Total

**Matrix: Water** 

Analysis Batch: 561270

Prep Type: Total/NA

**Prep Batch: 557767** 

				iotai							
	Spike	LCSD	LCSD	Uncert.					%Rec		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC	Unit	%Rec	Limits	RER	Limit
Radium-226	11.3	10.17		1.23	1.00	0.227	pCi/L	90	75 - 125	0.07	1
		Analyte Added	Analyte Added Result	Analyte Added Result Qual	Spike     LCSD     LCSD     Uncert.       Analyte     Added     Result     Qual     (2σ+/-)	Spike LCSD LCSD Uncert.  Analyte Added Result Qual (2σ+/-) RL	Spike       LCSD LCSD       Uncert.         Analyte       Added Result Qual (2σ+/-) RL MDC	Spike LCSD LCSD Uncert.  Analyte Added Result Qual (2σ+/-) RL MDC Unit	Spike LCSD LCSD Uncert.  Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec	Spike LCSD LCSD Uncert. %Rec Analyte Added Result Qual (2σ+/-) RL MDC Unit %Rec Limits	Spike         LCSD         LCSD         Uncert.         %Rec           Analyte         Added         Result         Qual         (2σ+/-)         RL         MDC         Unit         %Rec         Limits         RER

LCSD LCSD

Carrier %Yield Qualifier Limits Ba Carrier 95.8 40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-557769/19-A Client Sample ID: Method Blank M

Lub Cumple ID: IIID 100-007 100/10-A	Onent Gample ID: Method Blank
Matrix: Water	Prep Type: Total/NA
Analysis Batch: 561238	Prep Batch: 557769
Count Total	

			Count	iolai						
	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1612	U	0.241	0.242	1.00	0.404	pCi/L	03/29/22 14:17	04/19/22 12:35	1

	MB MB			
Carrier	%Yield Qualifier	Limits	Prepared Analyzed	Dil Fac
Ba Carrier	97.3	40 - 110	03/29/22 14:17 04/19/22 12:3	<del>1</del>
Y Carrier	85.6	40 - 110	03/29/22 14:17 04/19/22 12:3	5 1

**Eurofins Denver** 

## **QC Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1

**Prep Batch: 557769** 

SDG: AVS Landfill

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

Lab Sample ID: LCS 160-557769/1-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 561237 Prep Batch: 557769** 

				Total					
	Spike	LCS	LCS	Uncert.				%Rec	
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	
Radium-228	8.69	9.942		1.16	1.00	0.415 pCi/L	114	75 - 125	

LCS LCS Carrier %Yield Qualifier Limits Ba Carrier 90.9 40 - 110 82.2 40 - 110 Y Carrier

Lab Sample ID: LCSD 160-557769/2-A **Client Sample ID: Lab Control Sample Dup Matrix: Water** Prep Type: Total/NA

Analysis Batch: 561237

				iotai						
	Spike	LCSD	LCSD	Uncert.				%Rec		RER
Analyte	Added	Result	Qual	(2σ+/-)	RL	MDC Unit	%Rec	Limits	RER	Limit
Radium-228	8.69	9.223		1.09	1.00	0.426 pCi/L	106	75 - 125	0.32	1

LCSD LCSD %Yield Qualifier Carrier Limits Ba Carrier 95.8 40 - 110 Y Carrier 83.4 40 - 110

## **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1

SDG: AVS Landfill

#### Rad

## **Prep Batch: 557767**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	PrecSep-21	<del>-</del>
280-160139-2	MW-24S	Total/NA	Water	PrecSep-21	
280-160139-3	MW-21S	Total/NA	Water	PrecSep-21	
280-160139-4	DUP	Total/NA	Water	PrecSep-21	
MB 160-557767/19-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-557767/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-557767/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

#### **Prep Batch: 557769**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	PrecSep_0	- <del></del>
280-160139-2	MW-24S	Total/NA	Water	PrecSep_0	
280-160139-3	MW-21S	Total/NA	Water	PrecSep_0	
280-160139-4	DUP	Total/NA	Water	PrecSep_0	
MB 160-557769/19-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-557769/1-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-557769/2-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

**Client Sample ID: MW-22S** Lab Sample ID: 280-160139-1

Date Collected: 03/22/22 10:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			503.281000 mL	1.0 g	557767	03/29/22 13:42	LPS	TAL SL
Total/NA	Analysis	9315		1			561270	04/20/22 14:25	FLC	TAL SL
Total/NA	Prep	PrecSep_0			503.281000 mL	1.0 g	557769	03/29/22 14:17	LPS	TAL SL
Total/NA	Analysis	9320		1			561237	04/19/22 12:32	CLP	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			561610	04/22/22 15:09	SCB	TAL SL

Lab Sample ID: 280-160139-2 Client Sample ID: MW-24S Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Prep Type Total/NA Total/NA	Batch Type Prep Analysis	Batch Method PrecSep-21 9315	Run	Dil Factor	Amount 503.64 mL	Amount 1.0 g	Batch Number 557767 561270	Prepared or Analyzed 03/29/22 13:42 04/20/22 14:25		Lab TAL SL
Total/NA Total/NA	Prep Analysis	PrecSep_0 9320		1	503.64 mL	1.0 g	557769 561237	03/29/22 14:17 04/19/22 12:32	LPS	TAL SL TAL SL
Total/NA	Analysis	Ra226_Ra228		1			561610	04/22/22 15:09	SCB	TAL SL

Client Sample ID: MW-21S Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

Batch Batch Dil Initial Final Batch Prepared Method or Analyzed **Prep Type** Type Run **Factor Amount** Amount Number Analyst Lab Total/NA PrecSep-21 745.88 mL 557767 03/29/22 13:42 LPS TAL SL Prep 1.0 g Total/NA Analysis 9315 1 561271 04/20/22 14:26 FLC TAL SL Total/NA 03/29/22 14:17 LPS Prep PrecSep 0 745.88 mL 1.0 g 557769 TAL SL Total/NA Analysis 9320 561237 04/19/22 12:32 CLP TAL SL 1

1

Client Sample ID: DUP Lab Sample ID: 280-160139-4

561610

04/22/22 15:09 SCB

Date Collected: 03/22/22 12:50 Date Received: 03/24/22 11:05

Analysis

Total/NA

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			753.11 mL	1.0 g	557767	03/29/22 13:42	LPS	TAL SL
Total/NA	Analysis	9315		1			561271	04/20/22 14:27	FLC	TAL SL
Total/NA	Prep	PrecSep_0			753.11 mL	1.0 g	557769	03/29/22 14:17	LPS	TAL SL
Total/NA	Analysis	9320		1		-	561237	04/19/22 12:32	CLP	TAL SL
Total/NA	Analysis	Ra226 Ra228		1			561610	04/22/22 15:09	SCB	TAL SL

**Laboratory References:** 

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

Ra226 Ra228

TAL SL

**Matrix: Water** 

Job ID: 280-160139-1 SDG: AVS Landfill

## **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

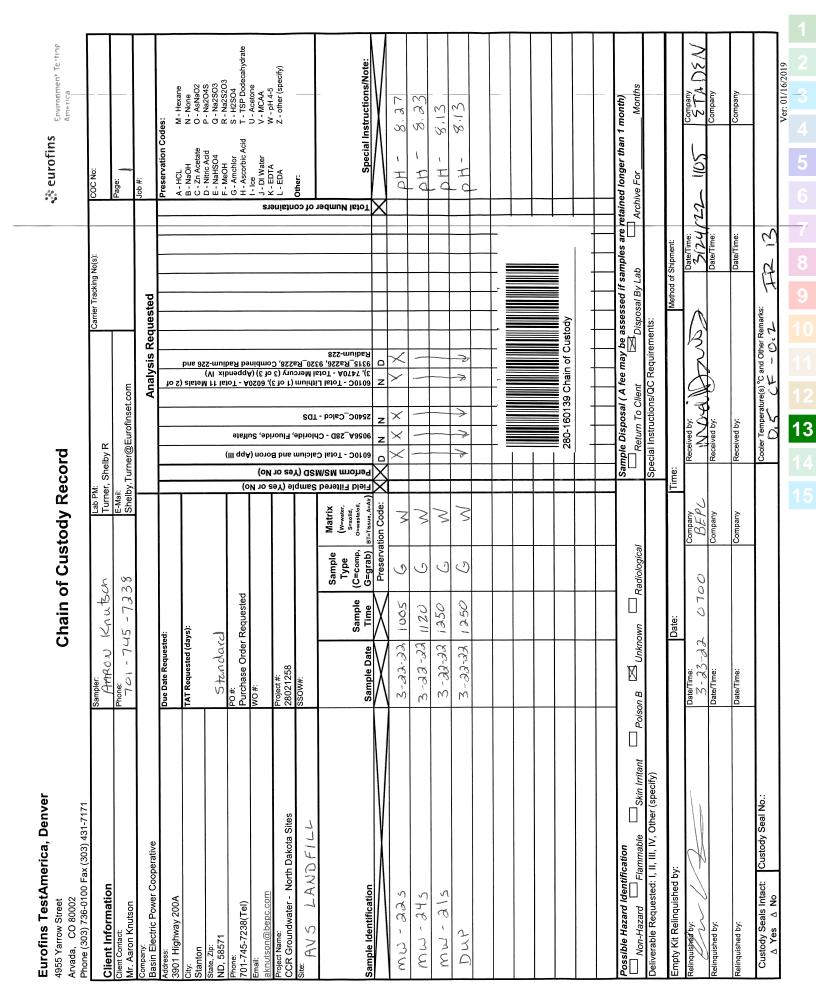
Job ID: 280-160139-1 SDG: AVS Landfill

## **Laboratory: Eurofins St. Louis**

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-22
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

4/22/2022



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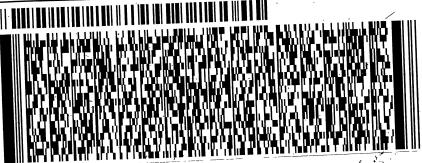
STANTON, ND 58571 UNITED STATES US SHELBY TURNER **EUROFINS TESTAMERICA, DENVER** 4955 YARROW ST

1997687

56DJ5/EB02/FE4A

ARVADA CO 80002

REF: CCR GROUNDWATER - ND SITE



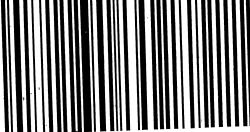
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> 80002 DEN CO-US









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3/23/22, 7:37 AM

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Company

Date/Time:

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Eurofins Denver												;		
4955 Yarrow Street		hain	Chain of Custody Record	A VPO	PCOT	7						🔅 eurofins		Fnyironment Testing
Arvada, CO 80002	,	5		2		3							4	America
Phone: 303-736-0100 Fax: 303-431-7171													J	
Client Information (Sub Contract Lab)	Sampler:			Lab PM: Turner	Lab PM: Turner, Shelby R	۲ ۲			Carrier Tr	Carrier Tracking No(s)		COC No. 280-608124.1	3124.1	
Client Contact Shipping/Receiving	Phone			E-Mail Shelb	by Turne	-@Eur	E-Mail: Shelby Turner@Eurofinset.com		State of Origin	rigin		Page.	1	
Company. TestAmerica Laboratories, Inc.					Accreditations Required (i	ons Required	Accreditations Required (See note) State - North Dakota	te):				Job #:	130-1	
Address: 13715 Rider Trail North,	Due Date Requested	ij					1	alveie B	Analysis Reminested			Preserva	Preservation Codes:	
Giry. Earth City	TAT Requested (days):	ıys):										A - HCL B - NaOH		- Hexane None
State, Zip. MO 63045							pue (					D - Nitric E - NaHS		O - AsnaO2 P - Na2O4S Q - Na2SO3
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	# Od				T. E.		ozz-wn					F - MeOH		Na2S2O3 H2SO4
Email	*OM				(0		ibsЯ t							T - TSP Dodecahydrate U - Acetone ∨ - MCAA
Project Name. CCR Groundwater - North Dakota Sites -AVS Landfill	Project #: 28021258				N 10 88		ənidmo					-		W - pH 4-5 Z - other (specify)
Site:	SSOW#				y) as		PC/ Cc					of terr		
			Sample	Matrix (w=water,	MSM m	919/82Ss 919/82Ss	4228 -228				~	umber c		
Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	ć (	S=solid, O=waste/oil, BT=Tissue, A=Air)	Perfor		Ra226R Radium						oecial Instr	Special Instructions/Note:
	$\langle$	$\setminus$		on Code:	X									V College
MW-22S (280-160139-1)	3/22/22	10:05 Central		Water		×	×					2		
MW-24S (280-160139-2)	3/22/22	11:05 Central		Water		×	×					2		
MW-21S (280-160139-3)	3/22/22	12:50 Central		Water		×	×					2	,	
DUP (280-160139-4)	3/22/22	12:50 Central		Water		×	×					2		
Note: Since laboratory accreditations are subject to change. Eurofins TestAmerica 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 cure maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica altention will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica.	nerica places the ownershi atrix being analyzed, the se nt to date, return the signed	p of method, a imples must b I Chain of Cus	nalyte & accredit e shipped back to tody attesting to s	ation compliar the Eurofins said complicar	ice upon ou TestAmeric ice to Euro	ut subcor sa labora fins Test	tract laborat ory or other America	ries. This sons was	Imple shipmer ill be provided	it is forwarde Any chang	d under cha	in-of-custody. It	f the laboratory nould be brougl	of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently notes must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins chain of Custody attesting to said complicance to Eurofins TestAmerica.
Possible Hazard Identification					Sam	ole Dis	A) Jesoc	ee may b	e assessec	if sampl	s are re	Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)	r than 1 mc	nth)
Unconfirmed						Return	Return To Client		Disposal By Lab	By Lab		Archive For		Months
Deliverable Requested: I, II, III, IV, Other (specify)	Primary Deliverable Rank: 2	able Rank:	2		Speci	al Instr	uctions/Q	Special Instructions/QC Requirements:	nents:					

**Eurofins Denver** 

linquished by: Relinquished

Custody Seal No.

Custody Seals Intact: Δ Yes Δ No

## **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-160139-1

SDG Number: AVS Landfill

Login Number: 160139 List Source: Eurofins Denver

List Number: 1

Creator: Rystrom, Joshua R

Creator. Rystrom, Joshua R		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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## **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-160139-1 SDG Number: AVS Landfill

Login Number: 160139
List Source: Eurofins St. Louis
List Number: 2
List Creation: 03/28/22 12:49 PM

Creator: Worthington, Sierra M

Creator: Worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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## **Tracer/Carrier Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-1 SDG: AVS Landfill

Method: 9315 - Radium-226 (GFPC)

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

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
280-160139-1	MW-22S	102	
280-160139-2	MW-24S	108	
280-160139-3	MW-21S	85.7	
280-160139-4	DUP	89.1	
LCS 160-557767/1-A	Lab Control Sample	90.9	
LCSD 160-557767/2-A	Lab Control Sample Dup	95.8	
MB 160-557767/19-A	Method Blank	97.3	
Tracer/Carrier Legend			

Method: 9320 - Radium-228 (GFPC)

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

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
280-160139-1	MW-22S	102	82.2	
280-160139-2	MW-24S	108	82.6	
280-160139-3	MW-21S	85.7	83.4	
280-160139-4	DUP	89.1	87.1	
LCS 160-557769/1-A	Lab Control Sample	90.9	82.2	
LCSD 160-557769/2-A	Lab Control Sample Dup	95.8	83.4	
MB 160-557769/19-A	Method Blank	97.3	85.6	

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

**Eurofins Denver** 

# **America**

## **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-160139-2

Laboratory Sample Delivery Group: AVS Landfill

Client Project/Site: CCR Groundwater - North Dakota Sites -

**AVS Landfill** 

For:

eurofins 🙀

**Basin Electric Power Cooperative** 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Authorized for release by: 4/15/2022 1:43:55 PM

Shelby Turner, Project Manager I (303)736-0100

Shelby Twine

Shelby.Turner@et.eurofinsus.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.

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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

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

Project Manager at the e-mail address or telephone number listed on this page.

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	8
Sample Summary	9
Client Sample Results	10
QC Sample Results	14
QC Association	19
Chronicle	22
Certification Summary	24
Chain of Custody	25
Receipt Checklists	27

4

9

11

12

13

## **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

#### **Qualifiers**

#### **General Chemistry**

Qualifier **Qualifier Description** 

Н Sample was prepped or analyzed beyond the specified holding time

#### **Glossary**

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

¤ Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery **CFL** Contains Free Liquid CFU Colony Forming Unit CNF Contains No Free Liquid

**DER** Duplicate Error Ratio (normalized absolute difference)

**Dilution Factor** Dil Fac

Detection Limit (DoD/DOE) DΙ

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

Decision Level Concentration (Radiochemistry) DLC

**EDL** Estimated Detection Limit (Dioxin) LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit ML Minimum Level (Dioxin) Most Probable Number MPN MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL **Practical Quantitation Limit** 

**PRES** Presumptive QC **Quality Control** 

Relative Error Ratio (Radiochemistry) RER

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) Toxicity Equivalent Quotient (Dioxin) TEQ

**TNTC** Too Numerous To Count

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

Job ID: 280-160139-2

**Laboratory: Eurofins Denver** 

**Narrative** 

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - North Dakota Sites -AVS Landfill

Report Number: 280-160139-2

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

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

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

#### **RECEIPT**

The samples were received on 3/24/2022 11:05 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.3° C.

#### **TOTAL RECOVERABLE METALS**

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 03/31/2022 and analyzed on 04/05/2022 and 04/06/2022.

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

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

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for total metals (ICPMS) in accordance with EPA SW-846 6020A. The samples were prepared on 03/30/2022 and analyzed on 03/31/2022.

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

#### **TOTAL MERCURY**

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 04/01/2022.

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

#### **TOTAL DISSOLVED SOLIDS**

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 03/25/2022, 03/29/2022 and 03/30/2022.

A deviation from the Standard Operating Procedure (SOP) occurred. Details are as follows: The following samples in batch 280-5769847 did not have a QC duplicate (-DU) analyzed on a batch of 10 samples: MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-however, the batch precision is demonstrated through passing LCS/LCSD % recovery and RPD. The laboratory reanalyzed the samples out of hold time in batch 280-570244 to confirm results. Both sets of data have been reported.

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#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

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## Job ID: 280-160139-2 (Continued)

#### **Laboratory: Eurofins Denver (Continued)**

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

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

Samples MW-22S (280-160139-1), MW-24S (280-160139-2), MW-21S (280-160139-3) and DUP (280-160139-4) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A (28 Days). The samples were analyzed on 04/10/2022 and 04/12/2022.

Samples MW-22S (280-160139-1)[5X], MW-21S (280-160139-3)[5X] and DUP (280-160139-4)[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.

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## **Detection Summary**

Client: Basin Electric Power Cooperative

**Client Sample ID: MW-22S** 

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

## Lab Sample ID: 280-160139-1

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	159	100		ug/L	1	_	6010C	Total
								Recoverable
Calcium	4030	200		ug/L	1		6010C	Total
								Recoverable
Lithium	52.3	20.0		ug/L	1		6010C	Total
								Recoverable
Barium	68.9	1.00		ug/L	1		6020A	Total/NA
Chloride	10.2	3.00		mg/L	1		9056A	Total/NA
Fluoride	1.51	0.500		mg/L	1		9056A	Total/NA
Sulfate	230	25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1630	20.0		mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-24S

## Lab Sample ID: 280-160139-2

Analyte	Result Qua	alifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	135	100		ug/L	1	_	6010C	Total
								Recoverable
Calcium	5420	200		ug/L	1		6010C	Total
								Recoverable
Lithium	62.6	20.0		ug/L	1		6010C	Total
								Recoverable
Barium	81.2	1.00		ug/L	1		6020A	Total/NA
Chromium	3.20	2.00		ug/L	1		6020A	Total/NA
Cobalt	1.51	1.00		ug/L	1		6020A	Total/NA
Molybdenum	10.6	2.00		ug/L	1		6020A	Total/NA
Chloride	50.4	3.00		mg/L	1		9056A	Total/NA
Fluoride	1.23	0.500		mg/L	1		9056A	Total/NA
Sulfate	44.0	5.00		mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	1840	40.0		mg/L	1		SM 2540C	Total/NA
Total Dissolved Solids (TDS)	1970 H	40.0		mg/L	1		SM 2540C	Total/NA

## **Client Sample ID: MW-21S**

## Lab Sample ID: 280-160139-3

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	156	100		ug/L	1	_	6010C	Total
								Recoverable
Calcium	6180	200		ug/L	1		6010C	Total
								Recoverable
Lithium	42.8	20.0		ug/L	1		6010C	Total
								Recoverable
Barium	47.9	1.00		ug/L	1		6020A	Total/NA
Molybdenum	3.31	2.00		ug/L	1		6020A	Total/NA
Chloride	17.1	3.00		mg/L	1		9056A	Total/NA
Fluoride	1.20	0.500		mg/L	1		9056A	Total/NA
Sulfate	642	25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	2160	40.0		mg/L	1		SM 2540C	Total/NA
Total Dissolved Solids (TDS)	2170 H	40.0		mg/L	1		SM 2540C	Total/NA

## **Client Sample ID: DUP**

## Lab Sample ID: 280-160139-4

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
Boron	153	100	ug/L		6010C	Total
						Recoverable

This Detection Summary does not include radiochemical test results.

**Eurofins Denver** 

## **Detection Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Client Sample ID: DUP (Continued)

Lab Sample ID: 280-160139-4

Job ID: 280-160139-2

SDG: AVS Landfill

Analyte	Result Q	ualifier RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	6250	200		ug/L	1	_	6010C	 Total
								Recoverable
Lithium	40.0	20.0		ug/L	1		6010C	Total
								Recoverable
Barium	49.5	1.00		ug/L	1		6020A	Total/NA
Molybdenum	3.57	2.00		ug/L	1		6020A	Total/NA
Chloride	17.2	3.00		mg/L	1		9056A	Total/NA
Fluoride	1.24	0.500		mg/L	1		9056A	Total/NA
Sulfate	643	25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	2180	40.0		mg/L	1		SM 2540C	Total/NA
Total Dissolved Solids (TDS)	2220 H	40.0		mg/L	1		SM 2540C	Total/NA

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## **Method Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Method **Method Description** Protocol Laboratory SW846 TAL DEN 6010C Metals (ICP) 6020A Metals (ICP/MS) SW846 TAL DEN 7470A Mercury (CVAA) SW846 TAL DEN 9056A Anions, Ion Chromatography SW846 TAL DEN Solids, Total Dissolved (TDS) SM SM 2540C TAL DEN 3005A Preparation, Total Recoverable or Dissolved Metals SW846 TAL DEN Preparation, Total Metals 3020A SW846 TAL DEN 7470A Preparation, Mercury SW846 TAL DEN

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### **Laboratory References:**

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

**Eurofins Denver** 

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Job ID: 280-160139-2 SDG: AVS Landfill

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## **Sample Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-160139-1	MW-22S	Water	03/22/22 10:05	03/24/22 11:05
280-160139-2	MW-24S	Water	03/22/22 11:05	03/24/22 11:05
280-160139-3	MW-21S	Water	03/22/22 12:50	03/24/22 11:05
280-160139-4	DUP	Water	03/22/22 12:50	03/24/22 11:05

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Job ID: 280-160139-2

SDG: AVS Landfill

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Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

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

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1

Date Collected: 03/22/22 10:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 100 03/31/22 11:02 04/05/22 10:26 **Boron** 159 ug/L **Calcium** 4030 200 ug/L 03/31/22 11:02 04/05/22 10:26 20.0 03/31/22 11:02 04/06/22 22:33 Lithium 52.3 ug/L

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

**Analyte** Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 100 03/31/22 11:02 04/05/22 10:30 **Boron** 135 ug/L 200 03/31/22 11:02 04/05/22 10:30 **Calcium** 5420 ug/L 1 20.0 ug/L 03/31/22 11:02 04/06/22 22:37 Lithium 62.6

Client Sample ID: MW-21S Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

Analyte Result Qualifier RL **MDL** Unit D Dil Fac Prepared Analyzed 100 03/31/22 11:02 04/05/22 10:34 **Boron** 156 ug/L 200 03/31/22 11:02 04/05/22 10:34 Calcium 6180 ug/L 20.0 03/31/22 11:02 04/06/22 22:41 Lithium 42.8 ug/L

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4

Date Collected: 03/22/22 12:50

Date Received: 03/24/22 11:05 Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 100 ug/L 03/31/22 11:02 04/05/22 10:38 **Boron** 153 **Calcium** 6250 200 ug/L 03/31/22 11:02 04/05/22 10:38 40.0 20.0 ug/L 03/31/22 11:02 04/06/22 22:46 Lithium

Method: 6020A - Metals (ICP/MS)

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1 Date Collected: 03/22/22 10:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Result Qualifier Analyte RL MDL Unit Prepared Analyzed Dil Fac 2.00  $\overline{\mathsf{ND}}$ 03/30/22 06:59 03/31/22 19:37 Antimony ug/L ND 5.00 03/30/22 06:59 03/31/22 19:37 Arsenic ug/L 68.9 1.00 ug/L 03/30/22 06:59 03/31/22 19:37 **Barium** Beryllium 1.00 03/30/22 06:59 03/31/22 19:37 ND ug/L Cadmium ND 1.00 03/30/22 06:59 03/31/22 19:37 ug/L Chromium ND 2.00 ug/L 03/30/22 06:59 03/31/22 19:37 Cobalt ND 1.00 03/30/22 06:59 03/31/22 19:37 ug/L Lead ND 1.00 ug/L 03/30/22 06:59 03/31/22 19:37 03/30/22 06:59 ND 2.00 ug/L 03/31/22 19:37 Molybdenum Selenium ND 5.00 ug/L 03/30/22 06:59 03/31/22 19:37 Thallium ND 1.00 ug/L 03/30/22 06:59 03/31/22 19:37

**Eurofins Denver** 

Job ID: 280-160139-2 SDG: AVS Landfill

**Matrix: Water** 

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Method: 6020A - Metals (ICP/MS)

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Date Received. 03/24/22	. 11.05						
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND ND	2.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Arsenic	ND	5.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Barium	81.2	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Beryllium	ND	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Cadmium	ND	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Chromium	3.20	2.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Cobalt	1.51	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Lead	ND	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Molybdenum	10.6	2.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Selenium	ND	5.00	ug/L		03/30/22 06:59	03/31/22 19:41	1
Thallium	ND	1.00	ug/L		03/30/22 06:59	03/31/22 19:41	1

**Client Sample ID: MW-21S** Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** Date Received: 03/24/22 11:05

Date Received: 03/24/22	11:05							
Analyte	Result Qualifier	RL	MDL Un	nit	D	Prepared	Analyzed	Dil Fac
Antimony	ND ND	2.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Arsenic	ND	5.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Barium	47.9	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Beryllium	ND	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Cadmium	ND	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Chromium	ND	2.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Cobalt	ND	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Lead	ND	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Molybdenum	3.31	2.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Selenium	ND	5.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1
Thallium	ND	1.00	ug/	/L		03/30/22 06:59	03/31/22 19:44	1

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

11:05							
Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
ND ND	2.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	5.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
49.5	1.00	ı	ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	1.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	1.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	2.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	1.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	1.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
3.57	2.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	5.00		ug/L		03/30/22 06:59	03/31/22 19:48	1
ND	1.00	1	ug/L		03/30/22 06:59	03/31/22 19:48	1
	Result Qualifier  ND  ND  49.5  ND  ND  ND  ND  ND  ND  ND  ND  ND  N	Result         Qualifier         RL           ND         2.00           ND         5.00           49.5         1.00           ND         5.00	Result         Qualifier         RL         MDL           ND         2.00           ND         5.00           49.5         1.00           ND         1.00           ND         1.00           ND         2.00           ND         1.00           ND         1.00           ND         2.00           ND         5.00	Result         Qualifier         RL         MDL         Unit           ND         2.00         ug/L           ND         5.00         ug/L           49.5         1.00         ug/L           ND         5.00         ug/L	Result         Qualifier         RL         MDL         Unit         D           ND         2.00         ug/L         ug/L           ND         5.00         ug/L         ug/L           49.5         1.00         ug/L           ND         5.00         ug/L	Result         Qualifier         RL         MDL         Unit         D         Prepared           ND         2.00         ug/L         03/30/22 06:59           ND         5.00         ug/L         03/30/22 06:59           49.5         1.00         ug/L         03/30/22 06:59           ND         2.00         ug/L         03/30/22 06:59           ND         5.00         ug/L         03/30/22 06:59	Result ND         Qualifier         RL         MDL Unit         D yerepared         Analyzed           ND         2.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         5.00         ug/L         03/30/22 06:59         03/31/22 19:48           49.5         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         2.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         1.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         2.00         ug/L         03/30/22 06:59         03/31/22 19:48           ND         5.00         ug/L         03/30/22 06:59         03/31/22 19:48

Job ID: 280-160139-2

SDG: AVS Landfill

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1 **Matrix: Water** 

Date Collected: 03/22/22 10:05

Date Received: 03/24/22 11:05

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 0.000200 04/01/22 11:51 04/01/22 16:10 Mercury ND mg/L

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 **Matrix: Water** 

Date Collected: 03/22/22 11:05 Date Received: 03/24/22 11:05

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 0.000200 04/01/22 11:51 04/01/22 16:13 Mercury ND mg/L

Client Sample ID: MW-21S

Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

**MDL** Unit Analyte RLResult Qualifier D Prepared Analyzed Dil Fac 04/01/22 11:51 04/01/22 16:15 Mercury ND 0.000200 mg/L

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4 Date Collected: 03/22/22 12:50

**Matrix: Water** 

**Matrix: Water** 

Date Received: 03/24/22 11:05

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac ND 04/01/22 11:51 04/01/22 16:18 Mercury 0.000200 mg/L

General Chemistry

Client Sample ID: MW-22S Lab Sample ID: 280-160139-1

Date Collected: 03/22/22 10:05

Date Received: 03/24/22 11:05

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	10.2	3.00	mg/L			04/10/22 11:24	1
Fluoride	1.51	0.500	mg/L			04/10/22 11:24	1
Sulfate	230	25.0	mg/L			04/12/22 00:31	5
Total Dissolved Solids (TDS)	1630	20.0	mg/L			03/29/22 11:34	1

Client Sample ID: MW-24S Lab Sample ID: 280-160139-2 Date Collected: 03/22/22 11:05 **Matrix: Water** 

Date Received: 03/24/22 11:05

Date Neceived. US/24/22 11.05									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	50.4		3.00		mg/L			04/10/22 11:39	1
Fluoride	1.23		0.500		mg/L			04/10/22 11:39	1
Sulfate	44.0		5.00		mg/L			04/10/22 11:39	1
Total Dissolved Solids (TDS)	1840		40.0		mg/L			03/25/22 15:32	1
Total Dissolved Solids (TDS)	1970	H	40.0		mg/L			03/30/22 13:32	1

Client Sample ID: MW-21S Lab Sample ID: 280-160139-3

Date Collected: 03/22/22 12:50

Date Received: 03/24/22 11:05

Date Received: 03/24/22 11:05									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	17.1		3.00		mg/L			04/10/22 11:55	1
Fluoride	1.20		0.500		mg/L			04/10/22 11:55	1
Sulfate	642		25.0		mg/L			04/10/22 12:10	5
Total Dissolved Solids (TDS)	2160		40.0		mg/L			03/25/22 15:32	1
Total Dissolved Solids (TDS)	2170	H	40.0		mg/L			03/30/22 13:32	1

**Eurofins Denver** 

Page 12 of 27

Job ID: 280-160139-2 SDG: AVS Landfill

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

**General Chemistry** 

**Client Sample ID: DUP** Lab Sample ID: 280-160139-4

Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

ı	Date Received: 00/24/22 11:00									
	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Chloride	17.2		3.00		mg/L			04/10/22 12:25	1
	Fluoride	1.24		0.500		mg/L			04/10/22 12:25	1
	Sulfate	643		25.0		mg/L			04/10/22 12:40	5
	Total Dissolved Solids (TDS)	2180		40.0		mg/L			03/25/22 15:32	1
	Total Dissolved Solids (TDS)	2220	H	40.0		mg/L			03/30/22 13:32	1

Job ID: 280-160139-2

SDG: AVS Landfill

RL

100

200

RI

20.0

Spike

Added

1000

50000

Spike

Added

1000

Spike

Added

1000

50000

Spike

Added

1000

MDL Unit

**MDL** Unit

LCS LCS

LCS LCS

LCSD LCSD

LCSD LCSD

1064

Result Qualifier

**MDL** Unit

ug/L

ug/L

1052

52760

Result Qualifier

1005

Result Qualifier

975.5

49680

Result Qualifier

ug/L

Unit

ug/L

ug/L

Unit

ug/L

Unit

Unit

ug/L

ug/L

ug/L

D

D

Dil Fac

Result Qualifier

ND

ND

Landfill

Analyte

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-570348/1-A **Matrix: Water** 

**Analysis Batch: 570848** MB MB

Boron Calcium

Lab Sample ID: MB 280-570348/1-A **Matrix: Water** 

**Analysis Batch: 571048** 

MB MB Result Qualifier

Analyte Lithium ND

Lab Sample ID: LCS 280-570348/2-A

**Matrix: Water** 

Analysis Batch: 570848

Analyte

Boron Calcium

Lab Sample ID: LCS 280-570348/2-A

**Matrix: Water** 

Analysis Batch: 571048

Analyte

Lab Sample ID: LCSD 280-570348/3-A

**Matrix: Water** 

Lithium

**Analysis Batch: 570848** 

Analyte Boron

Calcium

Lab Sample ID: LCSD 280-570348/3-A

**Matrix: Water** 

Analysis Batch: 571048

Analyte

Lithium

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-570059/1-A

**Matrix: Water** 

Analysis Batch: 570455

MR MR Analyte Result Qualifier

RL ND 2.00 Antimony Arsenic ND 5.00

Prepared Analyzed 03/31/22 11:02 04/05/22 09:13

03/31/22 11:02 04/05/22 09:13

Client Sample ID: Method Blank

**Client Sample ID: Method Blank** 

**Prep Type: Total Recoverable** 

Prep Batch: 570348

Prep Type: Total Recoverable Prep Batch: 570348

Prepared Analyzed Dil Fac

03/31/22 11:02 04/06/22 22:13 **Client Sample ID: Lab Control Sample** 

%Rec

D

**Prep Type: Total Recoverable** 

Prep Batch: 570348 %Rec

Limits 98 86 - 110 99 90 \_ 111

**Client Sample ID: Lab Control Sample** 

**Prep Type: Total Recoverable** 

Prep Batch: 570348

%Rec %Rec Limits

90 - 112

Client Sample ID: Lab Control Sample Dup

101

%Rec

106

**Prep Type: Total Recoverable** 

Prep Batch: 570348

%Rec **RPD** Limits RPD Limit D %Rec 86 - 110 105 8 20

ug/L ug/L 106 90 - 111 20

Client Sample ID: Lab Control Sample Dup **Prep Type: Total Recoverable** 

Prep Batch: 570348

%Rec **RPD** Limits **RPD** Limit

90 - 112 20

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

Prep Batch: 570059

Prepared Analyzed Dil Fac 03/30/22 06:59 03/31/22 18:26 03/30/22 06:59 03/31/22 18:26

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Page 14 of 27

4/15/2022

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

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

Lab Sample ID: MB 280-570059/1-A

**Matrix: Water** 

**Analysis Batch: 570455** 

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

Job ID: 280-160139-2 SDG: AVS Landfill

**Prep Batch: 570059** 

	MB M	В						
Analyte	Result Q	ualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	ND ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Beryllium	ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Cadmium	ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Chromium	ND	2.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Cobalt	ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Lead	ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Molybdenum	ND	2.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Selenium	ND	5.00		ug/L		03/30/22 06:59	03/31/22 18:26	1
Thallium	ND	1.00		ug/L		03/30/22 06:59	03/31/22 18:26	1

Lab Sample ID: LCS 280-570059/2-A

**Matrix: Water** 

Analysis Batch: 570455

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

**Prep Batch: 570059** 

Analysis Batch. 570450	Spike	LCS	LCS				%Rec
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Antimony	40.0	43.95		ug/L		110	85 - 115
Arsenic	40.0	39.96		ug/L		100	85 - 117
Barium	40.0	43.08		ug/L		108	85 - 118
Beryllium	40.0	39.70		ug/L		99	80 - 125
Cadmium	40.0	40.27		ug/L		101	85 - 115
Chromium	40.0	40.74		ug/L		102	84 - 121
Cobalt	40.0	40.02		ug/L		100	85 - 120
Lead	40.0	41.25		ug/L		103	85 - 118
Molybdenum	40.0	41.98		ug/L		105	85 - 119
Selenium	40.0	39.29		ug/L		98	77 - 122
Thallium	40.0	40.77		ug/L		102	85 - 118

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-570456/1-A

**Matrix: Water** 

**Analysis Batch: 570572** 

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

Prep Batch: 570456

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Mercury 0.000200 04/01/22 11:51 04/01/22 15:58 ND mg/L

Lab Sample ID: LCS 280-570456/2-A

**Matrix: Water** 

Analysis Batch: 570572

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

Client Sample ID: Lab Control Sample Dup

**Prep Batch: 570456** 

Prep Type: Total/NA

Prep Batch: 570456

%Rec Limits

LCS LCS Spike Analyte Added Result Qualifier Unit D %Rec 0.00500 102 84 - 120 Mercury 0.005084 mg/L

Lab Sample ID: LCSD 280-570456/3-A

**Matrix: Water** 

**Analysis Batch: 570572** 

Spike LCSD LCSD %Rec **RPD** Analyte Added Result Qualifier Unit Limits RPD Limit %Rec 0.00500 0.005007 84 - 120 Mercury mg/L 100

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Page 15 of 27

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-571341/83

**Matrix: Water** 

Analysis Batch: 571341

SDG: AVS Landfill

Job ID: 280-160139-2

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

	MB	MR							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00		mg/L			04/10/22 09:25	1
Fluoride	ND		0.500		mg/L			04/10/22 09:25	1
Sulfate	ND		5.00		mg/L			04/10/22 09:25	1

Lab Sample ID: LCS 280-571341/81

**Matrix: Water** 

**Analysis Batch: 571341** 

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

ı		Spike	LCS	LCS				%Rec	
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
	Chloride	 100	98.99		mg/L		99	90 - 110	
	Fluoride	5.00	4.817		mg/L		96	90 - 110	
	Sulfate	100	97.46		mg/L		97	90 - 110	

Lab Sample ID: LCSD 280-571341/82

**Matrix: Water** 

Analysis Batch: 571341

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

Spike LCSD LCSD %Rec **RPD** Analyte Added Result Qualifier Unit D %Rec Limits RPD Limit Chloride 100 99.05 mg/L 99 90 - 110 0 10 Fluoride 5.00 90 - 110 4.913 mg/L 98 2 10 Sulfate 100 97.48 mg/L 90 - 110 10

Lab Sample ID: MRL 280-571341/3

**Matrix: Water** 

Analyte Chloride Fluoride Sulfate

Analysis Batch: 571341

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

**Client Sample ID: Method Blank** 

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Prep Type: Total/NA

	Spike	MRL	MRL				%Rec
	Added	Result	Qualifier	Unit	D	%Rec	Limits
_	5.00	5.032		mg/L		101	50 - 150
	0.500	0.5206		mg/L		104	50 - 150
	5 00	ND		ma/l		96	50 - 150

Lab Sample ID: MB 280-571398/13

**Matrix: Water** 

Analysis Batch: 571398

MB MB

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.00		mg/L			04/11/22 15:13	1

Lab Sample ID: LCS 280-571398/11

**Matrix: Water** 

**Analysis Batch: 571398** 

-	Spike	LCS	LCS				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Sulfate	100	97.49		mg/L		97	90 - 110	

**Eurofins Denver** 

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

**Prep Type: Total/NA** 

**Client Sample ID: Lab Control Sample** 

50 - 150

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Lab Control Sample Dup

**Client Sample ID: Lab Control Sample** 

84

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

**Client Sample ID: Lab Control Sample Dup** Lab Sample ID: LCSD 280-571398/12 **Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 571398** 

LCSD LCSD Spike %Rec **RPD Analyte** Added Result Qualifier Unit %Rec Limits **RPD** Limit Sulfate 100 97.50 mg/L 97 90 - 110

Lab Sample ID: MRL 280-571398/10

**Matrix: Water** 

Sulfate

**Analysis Batch: 571398** 

Spike MRL MRL %Rec Analyte Added Result Qualifier Unit %Rec Limits

5.00

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

Lab Sample ID: MB 280-569847/1 **Client Sample ID: Method Blank** 

ND

mg/L

**Matrix: Water** 

**Analysis Batch: 569847** 

MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Total Dissolved Solids (TDS) ND 10.0 mg/L 03/25/22 15:32

Lab Sample ID: LCS 280-569847/2

**Matrix: Water** 

Analysis Batch: 569847

LCS LCS Spike %Rec Added Analyte Result Qualifier Unit %Rec Limits 504 486.0 96 88 - 114 Total Dissolved Solids (TDS) mg/L

Lab Sample ID: LCSD 280-569847/3

**Matrix: Water** 

**Analysis Batch: 569847** 

Spike LCSD LCSD %Rec **RPD** Added Result Qualifier Unit %Rec Limits RPD Limit 504 488.0 Total Dissolved Solids (TDS) mg/L 97 88 - 114 0

Lab Sample ID: MB 280-570088/1 **Client Sample ID: Method Blank** 

**Matrix: Water** 

**Analysis Batch: 570088** 

MB MB RL Analyte Result Qualifier MDL Unit Prepared Analyzed Dil Fac Total Dissolved Solids (TDS) ND 10.0 mg/L 03/29/22 10:34

Lab Sample ID: LCS 280-570088/2

**Matrix: Water** 

**Analysis Batch: 570088** 

LCS LCS Spike %Rec Analyte Added Result Qualifier Unit %Rec Limits Total Dissolved Solids (TDS) 504 490.0 mg/L 97 88 - 114

**Eurofins Denver** 

4/15/2022

# **QC Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2

SDG: AVS Landfill

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

Lab Sample ID: 280-160139-1 DU Client Sample ID: MW-22S Prep Type: Total/NA

**Matrix: Water** 

**Analysis Batch: 570088** 

DU DU RPD Sample Sample Analyte Result Qualifier Result Qualifier Unit RPD Limit Total Dissolved Solids (TDS) 1630 1644 mg/L

Lab Sample ID: MB 280-570244/1 **Client Sample ID: Method Blank Prep Type: Total/NA** 

**Matrix: Water** 

Analysis Batch: 570244

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac mg/L 03/30/22 13:32 Total Dissolved Solids (TDS) ND 10.0

Lab Sample ID: LCS 280-570244/2 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 570244

LCS LCS Spike %Rec Analyte Added Result Qualifier Limits Unit %Rec Total Dissolved Solids (TDS) 505 493.0 98 88 - 114 mg/L

Lab Sample ID: 280-160139-2 DU Client Sample ID: MW-24S Prep Type: Total/NA

**Matrix: Water** 

Analysis Batch: 570244

DU DU Sample Sample **RPD** Result Qualifier Result Qualifier RPD Limit Analyte Unit D Total Dissolved Solids (TDS) 1970 H 1968 0.2 mg/L 10

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2 SDG: AVS Landfill

### **Metals**

### **Prep Batch: 570059**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	3020A	<u> </u>
280-160139-2	MW-24S	Total/NA	Water	3020A	
280-160139-3	MW-21S	Total/NA	Water	3020A	
280-160139-4	DUP	Total/NA	Water	3020A	
MB 280-570059/1-A	Method Blank	Total/NA	Water	3020A	
LCS 280-570059/2-A	Lab Control Sample	Total/NA	Water	3020A	

### **Prep Batch: 570348**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total Recoverable	Water	3005A	
280-160139-2	MW-24S	Total Recoverable	Water	3005A	
280-160139-3	MW-21S	Total Recoverable	Water	3005A	
280-160139-4	DUP	Total Recoverable	Water	3005A	
MB 280-570348/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-570348/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
LCSD 280-570348/3-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	

### **Analysis Batch: 570455**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	6020A	570059
280-160139-2	MW-24S	Total/NA	Water	6020A	570059
280-160139-3	MW-21S	Total/NA	Water	6020A	570059
280-160139-4	DUP	Total/NA	Water	6020A	570059
MB 280-570059/1-A	Method Blank	Total/NA	Water	6020A	570059
LCS 280-570059/2-A	Lab Control Sample	Total/NA	Water	6020A	570059

### **Prep Batch: 570456**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	7470A	
280-160139-2	MW-24S	Total/NA	Water	7470A	
280-160139-3	MW-21S	Total/NA	Water	7470A	
280-160139-4	DUP	Total/NA	Water	7470A	
MB 280-570456/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-570456/2-A	Lab Control Sample	Total/NA	Water	7470A	
LCSD 280-570456/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	

### **Analysis Batch: 570572**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	7470A	570456
280-160139-2	MW-24S	Total/NA	Water	7470A	570456
280-160139-3	MW-21S	Total/NA	Water	7470A	570456
280-160139-4	DUP	Total/NA	Water	7470A	570456
MB 280-570456/1-A	Method Blank	Total/NA	Water	7470A	570456
LCS 280-570456/2-A	Lab Control Sample	Total/NA	Water	7470A	570456
LCSD 280-570456/3-A	Lab Control Sample Dup	Total/NA	Water	7470A	570456

### **Analysis Batch: 570848**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total Recoverable	Water	6010C	570348
280-160139-2	MW-24S	Total Recoverable	Water	6010C	570348

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Page 19 of 27

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

# **Metals (Continued)**

### **Analysis Batch: 570848 (Continued)**

Lab Sample ID 280-160139-3	Client Sample ID MW-21S	Prep Type  Total Recoverable	Matrix Water	Method 6010C	Prep Batch 570348
280-160139-4	DUP	Total Recoverable	Water	6010C	570348
MB 280-570348/1-A	Method Blank	Total Recoverable	Water	6010C	570348
LCS 280-570348/2-A	Lab Control Sample	Total Recoverable	Water	6010C	570348
LCSD 280-570348/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010C	570348

### **Analysis Batch: 571048**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total Recoverable	Water	6010C	570348
280-160139-2	MW-24S	Total Recoverable	Water	6010C	570348
280-160139-3	MW-21S	Total Recoverable	Water	6010C	570348
280-160139-4	DUP	Total Recoverable	Water	6010C	570348
MB 280-570348/1-A	Method Blank	Total Recoverable	Water	6010C	570348
LCS 280-570348/2-A	Lab Control Sample	Total Recoverable	Water	6010C	570348
LCSD 280-570348/3-A	Lab Control Sample Dup	Total Recoverable	Water	6010C	570348

# **General Chemistry**

### Analysis Batch: 569847

<b>Lab Sample ID</b> 280-160139-2	Client Sample ID MW-24S	Prep Type Total/NA	Matrix Water	Method SM 2540C	Prep Batch
280-160139-3	MW-21S	Total/NA	Water	SM 2540C	
280-160139-4	DUP	Total/NA	Water	SM 2540C	
MB 280-569847/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-569847/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-569847/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

### **Analysis Batch: 570088**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-1	MW-22S	Total/NA	Water	SM 2540C	
MB 280-570088/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-570088/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-160139-1 DU	MW-22S	Total/NA	Water	SM 2540C	

### Analysis Batch: 570244

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-160139-2	MW-24S	Total/NA	Water	SM 2540C	_
280-160139-3	MW-21S	Total/NA	Water	SM 2540C	
280-160139-4	DUP	Total/NA	Water	SM 2540C	
MB 280-570244/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-570244/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-160139-2 DU	MW-24S	Total/NA	Water	SM 2540C	

### Analysis Batch: 571341

<b>Lab Sample ID</b> 280-160139-1	Client Sample ID MW-22S	Prep Type Total/NA	Matrix Water	Method Prep Batch 9056A
280-160139-2	MW-24S	Total/NA	Water	9056A
280-160139-3	MW-21S	Total/NA	Water	9056A
280-160139-3	MW-21S	Total/NA	Water	9056A
280-160139-4	DUP	Total/NA	Water	9056A

**Eurofins Denver** 

Page 20 of 27 4/15/2022

2

Job ID: 280-160139-2

SDG: AVS Landfill

3

4

6

0

10

11

12

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Job ID: 280-160139-2

SDG: AVS Landfill

# **General Chemistry (Continued)**

### **Analysis Batch: 571341 (Continued)**

<b>Lab Sample ID</b> 280-160139-4	Client Sample ID  DUP	Prep Type Total/NA	Matrix Water	Method 9056A	Prep Batch
MB 280-571341/83	Method Blank	Total/NA	Water	9056A	
LCS 280-571341/81	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-571341/82	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-571341/3	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 571398

<b>Lab Sample ID</b> 280-160139-1	Client Sample ID MW-22S	Prep Type Total/NA	Matrix Water	Method 9056A	Prep Batch
MB 280-571398/13	Method Blank	Total/NA	Water	9056A	
LCS 280-571398/11	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-571398/12	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-571398/10	Lab Control Sample	Total/NA	Water	9056A	

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

**Client Sample ID: MW-22S** 

Date Collected: 03/22/22 10:05 Date Received: 03/24/22 11:05

Lab Sample ID: 280-160139-1

**Matrix: Water** 

Job ID: 280-160139-2

SDG: AVS Landfill

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			570848	04/05/22 10:26	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			571048	04/06/22 22:33	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	570059	03/30/22 06:59	KMS	TAL DEN
Total/NA	Analysis	6020A		1			570455	03/31/22 19:37	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	570456	04/01/22 11:51	MAB	TAL DEN
Total/NA	Analysis	7470A		1			570572	04/01/22 16:10	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	571341	04/10/22 11:24	RAF	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	571398	04/12/22 00:31	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	570088	03/29/22 11:34	LRB	TAL DEN

Lab Sample ID: 280-160139-2 **Client Sample ID: MW-24S** 

Date Collected: 03/22/22 11:05 **Matrix: Water** Date Received: 03/24/22 11:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DE
Total Recoverable	Analysis	6010C		1			570848	04/05/22 10:30	LMT	TAL DE
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DE
Total Recoverable	Analysis	6010C		1			571048	04/06/22 22:37	MAB	TAL DE
Total/NA	Prep	3020A			50 mL	50 mL	570059	03/30/22 06:59	KMS	TAL DE
Total/NA	Analysis	6020A		1			570455	03/31/22 19:41	LMT	TAL DE
Total/NA	Prep	7470A			30 mL	50 mL	570456	04/01/22 11:51	MAB	TAL DE
Total/NA	Analysis	7470A		1			570572	04/01/22 16:13	MAB	TAL DE
Total/NA	Analysis	9056A		1	10 mL	10 mL	571341	04/10/22 11:39	RAF	TAL DE
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	569847	03/25/22 15:32	ECC	TAL DE
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	570244	03/30/22 13:32	LRB	TAL DE

**Client Sample ID: MW-21S** Lab Sample ID: 280-160139-3 Date Collected: 03/22/22 12:50 **Matrix: Water** 

Date Received: 03/24/22 11:05

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			570848	04/05/22 10:34	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			571048	04/06/22 22:41	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	570059	03/30/22 06:59	KMS	TAL DEN
Total/NA	Analysis	6020A		1			570455	03/31/22 19:44	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	570456	04/01/22 11:51	MAB	TAL DEN
Total/NA	Analysis	7470A		1			570572	04/01/22 16:15	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	571341	04/10/22 11:55	RAF	TAL DEN

Page 22 of 27

### **Lab Chronicle**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

Client Sample ID: MW-21S Lab Sample ID: 280-160139-3

Date Collected: 03/22/22 12:50 Matrix: Water

Date Received: 03/24/22 11:05

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		5	10 mL	10 mL	571341	04/10/22 12:10	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	569847	03/25/22 15:32	ECC	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	570244	03/30/22 13:32	LRB	TAL DEN

Client Sample ID: DUP

Date Collected: 03/22/22 12:50

Lab Sample ID: 280-160139-4

Matrix: Water

Date Received: 03/24/22 11:05

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			570848	04/05/22 10:38	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	570348	03/31/22 11:02	MB	TAL DEN
Total Recoverable	Analysis	6010C		1			571048	04/06/22 22:46	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	570059	03/30/22 06:59	KMS	TAL DEN
Total/NA	Analysis	6020A		1			570455	03/31/22 19:48	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	570456	04/01/22 11:51	MAB	TAL DEN
Total/NA	Analysis	7470A		1			570572	04/01/22 16:18	MAB	TAL DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	571341	04/10/22 12:25	RAF	TAL DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	571341	04/10/22 12:40	RAF	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	569847	03/25/22 15:32	ECC	TAL DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	570244	03/30/22 13:32	LRB	TAL DEN

### **Laboratory References:**

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

Job ID: 280-160139-2

SDG: AVS Landfill

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# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - North Dakota Sites -AVS

Landfill

# **Laboratory: Eurofins Denver**

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

Authority	Program	Identification Number	<b>Expiration Date</b>
North Dakota	State	R-034	01-09-23

Job ID: 280-160139-2 SDG: AVS Landfill

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Check Highway 2004   Control	<b>:lient Information</b> lient Contact: Ir. Aaron Knutson						ı						
The page of the	lent Contact: r. Aaron Knutson	RON	nutsa	C	Lab PM Turne	: r, Shelby	/R		ర	ırrier Tracking No(s)		COC No:	
Anniyo Sis Requested   Anniyo Sis Remainded		1	-73		E-Mail: Shelby	.Turner	@Eurofin	set.com				Page:	
The control of the following is a simple Date   The control of the following	ompany. asin Electric Power Cooperative							Anal	ysis Requ	ested		Job #:	
Number of State   Number of	idress: 901 Highway 200A	Due Date Requested:						2 Of				Preservation C	
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Sample   Matrix   Sample   S	oject Name: CR Groundwater - North Dakota Sites	Project #: 28021258			70,70	JO SƏ			558, C				Z - other (specify)
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3-33-34   1350   C   W   W   W   W   W   W   W   W   W	, 24	-23-23	120	Ç	3		_		_			T	0
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Sample Disposal (A fee may be assessed if samples are retained longer than 11   Sample Disposal By Lab   Archive For								-			-		_
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Sample Disposal (A fee may be assessed if samples are retained longer than 1 range)  Sample Disposal (A fee may be assessed if samples are retained longer than 1 range)  Special Instructions/QC Requirements:    Pate:							280-16	1139 Cha	in of Custod				
Sample Disposal (A fee may be assessed if samples are retained longer than 1 refined for a season of frame).  Sample Disposal (A fee may be assessed if samples are retained longer than 1 reformance).  Special Instructions/QC Requirements:    Date:							+	+					
Poison B   Unknown   Radiological   Special Instructions/QC Requirements:   Date:						Samp		Sal (A fee	may be ass	essed if sampl	les are ret	 ained longer tha	1 month)
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rofins

TestAmerica

STANTON, ND 58571 UNITED STATES US

BILL SENDER

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SHELBY TURNER **EUROFINS TESTAMERICA, DENVER** 4955 YARROW ST

56DJ5/EB02/FE4A

ARVADA CO 80002

REF: CCR GROUNDWATER - ND SITE

FedEx Ship Manager - Print Your Label(s)



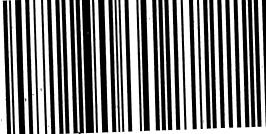
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# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-160139-2

SDG Number: AVS Landfill

Login Number: 160139 List Source: Eurofins Denver

List Number: 1

Creator: Rystrom, Joshua R

Creator: Rystrom, Joshua R		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	
Residual Chlorine Checked.	N/A	

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# **Environment Testing America**

# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-162908-1

Laboratory Sample Delivery Group: AVS Landfill New Wells Client Project/Site: CCR Groundwater - ND Sites - AVS Landfill

For:

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Authorized for release by:

Authorized for release by: 6/29/2022 1:58:26 PM

Shelby Turner, Project Manager I (303)736-0100

Shelby.Turner@et.eurofinsus.com

.....LINKS .....

Review your project results through

Have a Question?



Visit us at: www.eurofinsus.com/Env The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

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# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	13
Chronicle	14
Certification Summary	15
Chain of Custody	16
Receipt Checklists	20
Tracer Carrier Summary	22

6

8

10

12

# **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Qualifiers

Rad

Qualifier Qualifier Description

U Result is less than the sample detection limit.

**Glossary** 

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

Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery
CFL Contains Free Liquid
CFU Colony Forming Unit
CNF Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent
POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

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Job ID: 280-162908-1

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### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Job ID: 280-162908-1

**Laboratory: Eurofins Denver** 

Narrative

### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - ND Sites - AVS Landfill

Report Number: 280-162908-1

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.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

### **RECEIPT**

The samples were received on 5/31/2022 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 15.9° C.

The following samples were received at the laboratory outside the required temperature criteria at 15.9C: MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4). This does not meet regulatory requirements. It can be noted that metals and radiochemistry methods do not require thermal preservation. The only impacted methods are 9056A CL/FL/SO4 and 2540C TDS. The client was contacted on 5/31/22 regarding this issue, and the laboratory was instructed to cancel 9056A CL/FL/SO4 and 2540C TDS. The laboratory will only proceed with the requested metals and radiochemistry analyses. The client will recollect volume for Anions and TDS at a later date.

### RADIUM-226 (GFPC)

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 06/03/2022 and analyzed on 06/27/2022.

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

### RADIUM-228

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 06/03/2022 and analyzed on 06/21/2022.

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-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 06/28/2022.

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

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Job ID: 280-162908-1

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### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-1 SDG: AVS Landfill New Wells

3

Job ID: 280-162908-1 (Continued)

**Laboratory: Eurofins Denver (Continued)** 

RAD

Methods 903.0, 9315: Radium-226 batch 568241

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

 $\begin{tabular}{ll} MW-24S & (280-162908-1), MW-22S & (280-162908-2), MW-21S & (280-162908-3), DUP & (280-162908-4), (LCS 160-568241/1-A), (MB 160-568241/21-A), (160-45635-B-1-B) and (160-45635-B-1-C DU) \\ \end{tabular}$ 

Methods 904.0, 9320: Radium-228 batch 568242

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3), DUP (280-162908-4), (LCS 160-568242/1-A), (MB 160-568242/21-A), (160-45635-B-1-D) and (160-45635-B-1-E DU)

Method PrecSep 0:

Method PrecSep-21:

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

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# **Detection Summary**

Client: Basin Electric Power Cooperative	Job ID: 280-162908-1
Project/Site: CCR Groundwater - ND Sites - AVS Landfill	SDG: AVS Landfill New Wells
Client Sample ID: MW-24S	Lab Sample ID: 280-162908-1
No Detections.	
Client Sample ID: MW-22S	Lab Sample ID: 280-162908-2
No Detections.	
Client Sample ID: MW-21S	Lab Sample ID: 280-162908-3
No Detections.	
Client Sample ID: DUP	Lab Sample ID: 280-162908-4

This Detection Summary does not include radiochemical test results.

No Detections.

**Eurofins Denver** 

Page 6 of 22 6/29/2022

# **Method Summary**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-1 SDG: AVS Landfill New Wells Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Method	Method Description	Protocol	Laboratory
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
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

### **Protocol References:**

None = None

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

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

### Laboratory References:

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

# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - ND Sites - AVS Landfill Job ID: 280-162908-1 SDG: AVS Landfill New Wells

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-162908-1	MW-24S	Water	05/26/22 09:05	05/31/22 09:40
280-162908-2	MW-22S	Water	05/26/22 10:15	05/31/22 09:40
280-162908-3	MW-21S	Water	05/26/22 11:40	05/31/22 09:40
280-162908-4	DUP	Water	05/26/22 11:40	05/31/22 09:40

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-1 SDG: AVS Landfill New Wells

06/03/22 10:08 06/27/22 13:38

# Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-24S	Lab Sample ID: 280-162908-1

Date Collected: 05/26/22 09:05 **Matrix: Water** 

Date Received: 05/31/22 09:40

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.108	U	0.152	0.152	1.00	0.257	pCi/L	06/03/22 10:08	06/27/22 13:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					06/03/22 10:08	06/27/22 13:38	1

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 **Matrix: Water** 

Date Collected: 05/26/22 10:15 Date Received: 05/31/22 09:40

Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Radium-226	-0.0412	U	0.0894	0.0895	1.00	0.217	pCi/L	06/03/22 10:08	06/27/22 13:38	1
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
			Uncert.	Uncert.						
			Count	Total						

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3

Date Collected: 05/26/22 11:40 **Matrix: Water** 

40 - 110

Date Received: 05/31/22 09:40

Ba Carrier

Date Received.	00/01/22 0014		Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.101	U	0.0936	0.0941	1.00	0.141	pCi/L	06/03/22 10:08	06/27/22 13:38	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.0		40 - 110					06/03/22 10:08	06/27/22 13:38	1

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4 **Matrix: Water** 

Date Collected: 05/26/22 11:40

Date Received: 0	15/31/22 09:4	.0	Count Uncert.	Total Uncert.						
Analyte Radium-226		Qualifier U	(2σ+/-) 0.109	(2σ+/-) 0.109	1.00	MDC 0.190	Unit pCi/L	Prepared 06/03/22 10:08	Analyzed 06/27/22 13:39	Dil Fac
Carrier Ba Carrier	% <b>Yield</b> 99.3	Qualifier	Limits 40 - 110					<b>Prepared</b> 06/03/22 10:08	Analyzed 06/27/22 13:39	Dil Fac

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

Lab Sample ID: 280-162908-1 Client Sample ID: MW-24S **Matrix: Water** 

Date Collected: 05/26/22 09:05

Dil Fac
1
Dil Fac
-

**Eurofins Denver** 

Page 9 of 22

6/29/2022

Client: Basin Electric Power Cooperative

Job ID: 280-162908-1 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

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

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1

Date Collected: 05/26/22 09:05 **Matrix: Water** 

Date Received: 05/31/22 09:40

%Yield Qualifier Limits Prepared Dil Fac Analyzed Y Carrier 81.9 40 - 110 06/03/22 10:36 06/21/22 12:00

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2

Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analvzed	Dil Fac
Radium-228	0.427	U	0.497	0.499	1.00	0.816	pCi/L	06/03/22 10:36	06/21/22 12:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	100		40 - 110					06/03/22 10:36	06/21/22 12:00	1
Y Carrier	86.4		40 - 110					06/03/22 10:36	06/21/22 12:00	1

Lab Sample ID: 280-162908-3 Client Sample ID: MW-21S Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.402	U	0.420	0.421	1.00	0.681	pCi/L	06/03/22 10:36	06/21/22 12:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.0		40 - 110					06/03/22 10:36	06/21/22 12:00	1
Y Carrier	84.1		40 - 110					06/03/22 10:36	06/21/22 12:00	1

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received:	05/31/22 09:4	10	Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.782		0.457	0.462	1.00	0.665	pCi/L	06/03/22 10:36	06/21/22 12:00	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.3		40 - 110					06/03/22 10:36	06/21/22 12:00	1
Y Carrier	84.9		40 - 110					06/03/22 10:36	06/21/22 12:00	1

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

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1 **Matrix: Water** 

Date Collected: 05/26/22 09:05

226 + 228

Date Received: 05/	31/22 09:4	Ю								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium	1.20		0.608	0.617	5.00	0.809	pCi/L		06/28/22 14:11	1

**Eurofins Denver** 

# **Client Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-1 SDG: AVS Landfill New Wells

Method: Ra226 Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2

**Matrix: Water** 

Date Collected: 05/26/22 10:15 Date Received: 05/31/22 09:40

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226	0.386	U	0.505	0.507	5.00	0.816	pCi/L		06/28/22 14:11	1

+ 228

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3

**Matrix: Water** 

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

Date Neceived. 03/	31/22 03.4	FU								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.503	U	0.430	0.431	5.00	0.681	pCi/L		06/28/22 14:11	1

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4

**Matrix: Water** 

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

Count Total Uncert. Uncert. (2σ+/-) (2σ+/-) Dil Fac Analyte Result Qualifier RL **MDC** Unit Prepared Analyzed **Combined Radium** 0.665 pCi/L 06/28/22 14:11 0.845 0.470 0.475 5.00

226 + 228

Client: Basin Electric Power Cooperative

Job ID: 280-162908-1 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-568241/21-A

Lab Sample ID: LCS 160-568241/1-A

**Matrix: Water** 

**Matrix: Water** 

Analysis Batch: 571791

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 568241** 

MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-226 0.08051 U 0.0717 0.0721 1.00 0.108 pCi/L 06/03/22 10:08 06/27/22 14:11

Total

MB

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 106 40 - 110 06/03/22 10:08 06/27/22 14:11

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

**Prep Batch: 568241** 

Analysis Batch: 571791 Total

**Spike** 

8.51

%Rec Uncert.  $(2\sigma + / -)$ RL %Rec Limits MDC Unit

Analyte Added Result Qual Radium-226 11.3 12.30 1.30 1.00 0.107 pCi/L 108 75 - 125

LCS LCS

Count

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 101 40 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-568242/21-A

**Matrix: Water** 

Analysis Batch: 570920

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 568242

Total Count MB MB Uncert. Uncert. Analyte Result Qualifier **MDC** Unit  $(2\sigma + / -)$  $(2\sigma + / -)$ RL Prepared Analyzed Dil Fac Radium-228 -0.1152 Ū 0.200 0.200 1.00 0.410 pCi/L 06/03/22 10:36 06/21/22 12:03

Carrier %Yield Qualifier Limits Prepared Analyzed Dil Fac Ba Carrier 106 40 - 110 06/03/22 10:36 06/21/22 12:03 40 - 110 06/03/22 10:36 06/21/22 12:03 Y Carrier 93.1

1.04

1.00

0.407

pCi/L

Lab Sample ID: LCS 160-568242/1-A

MB MB

**Matrix: Water** 

Radium-228

**Analysis Batch: 570941** 

**Client Sample ID: Lab Control Sample** 

90

75 - 125

Prep Type: Total/NA

Prep Batch: 568242

Total **Spike** LCS LCS Uncert. %Rec Analyte Added Result Qual  $(2\sigma + / -)$ RL MDC Unit %Rec Limits

7.689

LCS LCS Carrier %Yield Qualifier Limits 40 - 110 Ba Carrier 101 90.8 Y Carrier 40 - 110

**Eurofins Denver** 

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-1 SDG: AVS Landfill New Wells

### Rad

### **Prep Batch: 568241**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	PrecSep-21	
280-162908-2	MW-22S	Total/NA	Water	PrecSep-21	
280-162908-3	MW-21S	Total/NA	Water	PrecSep-21	
280-162908-4	DUP	Total/NA	Water	PrecSep-21	
MB 160-568241/21-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-568241/1-A	Lab Control Sample	Total/NA	Water	PrecSep-21	

### **Prep Batch: 568242**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	PrecSep_0	
280-162908-2	MW-22S	Total/NA	Water	PrecSep_0	
280-162908-3	MW-21S	Total/NA	Water	PrecSep_0	
280-162908-4	DUP	Total/NA	Water	PrecSep_0	
MB 160-568242/21-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-568242/1-A	Lab Control Sample	Total/NA	Water	PrecSep 0	

4

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10

12

13

14

### **Lab Chronicle**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-1 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: MW-24S** 

Date Collected: 05/26/22 09:05 Date Received: 05/31/22 09:40

Lab Sample ID: 280-162908-1

**Matrix: Water** 

**Matrix: Water** 

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			504.73 mL	1.0 g	568241	06/03/22 10:08	MS	TAL SL
Total/NA	Analysis	9315		1			571791	06/27/22 13:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			504.73 mL	1.0 g	568242	06/03/22 10:36	MS	TAL SL
Total/NA	Analysis	9320		1			570920	06/21/22 12:00	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			572029	06/28/22 14:11	EMH	TAL SL

**Client Sample ID: MW-22S** Lab Sample ID: 280-162908-2

Date Collected: 05/26/22 10:15 Date Received: 05/31/22 09:40

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			500.32 mL	1.0 g	568241	06/03/22 10:08	MS	TAL SL
Total/NA	Analysis	9315		1			571791	06/27/22 13:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			500.32 mL	1.0 g	568242	06/03/22 10:36	MS	TAL SL
Total/NA	Analysis	9320		1			570920	06/21/22 12:00	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			572029	06/28/22 14:11	EMH	TAL SL

Lab Sample ID: 280-162908-3 **Client Sample ID: MW-21S** Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			749.93 mL	1.0 g	568241	06/03/22 10:08	MS	TAL SL
Total/NA	Analysis	9315		1			571791	06/27/22 13:38	CLP	TAL SL
Total/NA	Prep	PrecSep_0			749.93 mL	1.0 g	568242	06/03/22 10:36	MS	TAL SL
Total/NA	Analysis	9320		1			570920	06/21/22 12:00	FLC	TAL SL
Total/NA	Analysis	Ra226_Ra228		1			572029	06/28/22 14:11	EMH	TAL SL

Lab Sample ID: 280-162908-4 **Client Sample ID: DUP** 

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			749.12 mL	1.0 g	568241	06/03/22 10:08	MS	TAL SL
Total/NA	Analysis	9315		1			571799	06/27/22 13:39	FLC	TAL SL
Total/NA	Prep	PrecSep_0			749.12 mL	1.0 g	568242	06/03/22 10:36	MS	TAL SL
Total/NA	Analysis	9320		1			570920	06/21/22 12:00	FLC	TAL SL
Total/NA	Analysis	Ra226 Ra228		1			572029	06/28/22 14:11	EMH	TAL SL

**Laboratory References:** 

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

**Matrix: Water** 

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

### **Laboratory: Eurofins St. Louis**

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

Authority	Program	Identification Number	Expiration Date
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22
California	State	2886	07-01-22
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-22
HI - RadChem Recognition	State	n/a	06-30-22
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-22
MI - RadChem Recognition	State	9005	06-30-22
Missouri	State	780	06-30-22
Nevada	State	MO000542020-1	07-31-22
New Jersey	NELAP	MO002	06-30-22
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-22
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22
Texas	NELAP	T104704193	07-31-22
US Fish & Wildlife	US Federal Programs	058448	07-31-22
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

Job ID: 280-162908-1





Ver: 06/08/2021

13

eurofins Environment Testing America

# **Chain of Custody Record**

Phone: 303-736-0100 Fax: 303-431-7171

**Eurofins Denver** 

4955 Yarrow Street Arvada, CO 80002

Comparison	Phone:   Due Date Requested:   6/29/2022	Mail Melby Correctiation No. State - No. S	Tanget List	US.COM	State of Origin: North Dakota	gin: kota		280-616695.1 Page:
Pinger	re Requested: (222 quested (days):  258  258  Sample (Sample (was Sample (Cacomp Sample (Was Sample (Cacomp Sample Cacomp Sample (Cacomp Sample (Cacomp Sample Samp	Perform MS/MSD (Yes or No)	Target List	us.com	State of On North Da	gin: kota		Page.
State - North Dakota	ted (days):  ted (days):  Sample (Comp, ownstart)  Type sample (wested)  Type sample (Comp, ownstart)  Type sample (wested)  Type sample (wested)  Type sample (amount)  Sample (Google)  Sample (Sample ownstart)  Type sample (Wested)  Sample (Wested)  Sample (Amount)  Type sample ownstart)  Type sample ownstart  Type sample ownst	Perform MS/MSD (Yes or No)	Target List Dakota	se note):		nord		
Fidder Trail North,   City	ted (days):  Sample Type Type Type Type Type Type Type Type		Tanget List				Ī	1010
Strain North,   City	ted (days):  Sample Type Type C=comp,  Type G=grab)  Preserva  2 Central  2 Central  2 Central  2 Central  2 Central	Ferform MS/MSD (Yes or No)	tail tegnsT	1000			,,,,	280-45 280-162908-1
TAT Requested (days):   Po #   Po #	Sample Type Sample Type C=Comp, Preserva 09:05 Central Cartal	Feid Filtered Sample (Yes or No)	target List	Anaivsis	Analysis Requested			e Bo
Post	Sample Type,	Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No)	Target List					A - HCL M - Hexane B - NaOH N - None
Name	Sample Type Sample (C-comp) Type Type Type Og:05 Central To:09:05 Type Type Type Type Type Type Type Type	Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No)	id tegnsī					40
ND Sites - AVS Landfill 28021258  SSOW#:  An - Client ID (Lab ID) Sample Date Time G=grab) In-Timus, Avail, In-Perform Material Project (Pees or No) 5726/22 Central Dissolution Code: X X Size Size Size Size Size Size Size Size	Sample Type Sample Type C=Comp, Pate Time G=grab)  2 Central Preserva 2 Central Cantral Cantra Cantral Cantral Cantral Cantral Cantral Cantral Cantral Cantral	Field Filtered Sample (Yes or No)	6T					F - MeOH S - H2SO4 G - Amchlor T - TSP Dodecabudrate
ND Sites - AVS Landfill   28021258   SSOW#	Sample Type Type Type Type Time G=grab)  Preserva  09:05 Central To T	Field Filtered Sample (Yes or N	bra					H - Ascorbic Acid U - Acetone I - Ice V - MCAA
SSOW#:   Cample   Matrix   Sample   Matrix   M	Sample Type Type Sample (C=comp, Time G=grab) 6/22 Central 6/22 Central	Field Filtered Sample	bnate (					K - EDTA W - PH 4-5 K - EDA Y - Trizma L - EDA Z - other (specify)
Nater   Color   Colo	Sample (C=cope, Time G=grab) Time G=grab) Preserva 09:05 Central	Field Filtered:						Other:
8-1)  8-2)  8-2)  8-2)  5/26/22  Central  Water  X X  Central  Water  X X  11:40  Water  X X  5/26/22  Central  Water  X X  11:40  Water  X X  11:40  Water  X X	09:05 Central 10:15						o sedmulvi listoT	Special Instructions/Note
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8-2) 5/26/22 10:15 Water X X X S-26/22 Central Water X X X 5/26/22 Central Central X X X X X 5/26/22 Central X X X X 5/26/22 Central Central X X X X X 5/26/22 Central X X X X X 5/26/22 Central X X X X X X X X X X X X X X X X X X X	10:15 Central		$\vdash$				2	9
8-3) 5/26/22 11:40 Water X X 5/26/22 Central Water X X X 5/26/22 Central Water X X X 5/26/22 Central Central Central X X X X X 5/26/22 Central Central X X X X 5/26/22 Central X X X X X X X X X X X X X X X X X X X		×	┼				2	
5/26/22 11:40 Water X X X	11:40 Central		+-				2	
	11:40 Central		-				2	
Note: Since laboratory accreditations are subject to change. Eurofins TestAmerica 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/lests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica.	Eurofins TestAmerica places the ownership of method, analyte & accreditation comp analysis/lests/matrix being analyzed, the samples must be shipped back to the Eurofi ations are current to date, return the signed Chain of Custody attesting to said compli	bliance upon out sins TestAmerica li icance to Eurofins	ibcontract lab boratory or ot TestAmerica	oratories. This s	ample shipment	s forwarded und Any changes to	der chain-of-c accreditation	ustody. If the laboratory does not current status should be brought to Eurofins

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

Return To Client Disposal By Lab Archive For Mont 940Nme 0 2 2022 Date/Time Method of Shipment: Received by Odbington Received by: Cooler Temperature(s) °C and Other Remarks Special Instructions/QC Requirements: FED EX Received by: る会話。 Company Primary Deliverable Rank: 2 Date: Date/Time Deliverable Requested: I, II, III, IV, Other (specify) FED EX Custody Seal No. Possible Hazard Identification Empty Kit Relinquished by: Custody Seals Intact: △ Yes △ No Unconfirmed inquished by:

# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-162908-1 SDG Number: AVS Landfill New Wells

Login Number: 162908 List Source: Eurofins Denver

List Number: 1

Creator: Kazenga, Oliver M

Creator: Kazenga, Oliver M		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	N/A	
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	

2

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8

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12

# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-162908-1

SDG Number: AVS Landfill New Wells

Login Number: 162908 List Source: Eurofins St. Louis List Number: 2 List Creation: 06/02/22 09:35 AM

Creator: Worthington, Sierra M

Creator. Worthington, Sierra W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# **Tracer/Carrier Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-1 SDG: AVS Landfill New Wells

Method: 9315 - Radium-226 (GFPC	)
Matrix: Water	

**Prep Type: Total/NA** 

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
280-162908-1	MW-24S	101	
280-162908-2	MW-22S	100	
280-162908-3	MW-21S	99.0	
280-162908-4	DUP	99.3	
LCS 160-568241/1-A	Lab Control Sample	101	
MB 160-568241/21-A	Method Blank	106	
Tracer/Carrier Legen	d		

Method: 9320 - Radium-228 (GFPC)

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

		Ва	Y	Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
280-162908-1	MW-24S	101	81.9	
280-162908-2	MW-22S	100	86.4	
280-162908-3	MW-21S	99.0	84.1	
280-162908-4	DUP	99.3	84.9	
LCS 160-568242/1-A	Lab Control Sample	101	90.8	
MB 160-568242/21-A	Method Blank	106	93.1	

Ba = Ba Carrier Y = Y Carrier





# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-162908-2

Laboratory Sample Delivery Group: AVS Landfill New Wells Client Project/Site: CCR Groundwater - ND Sites - AVS Landfill

### For:

eurofins 🙀

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelby Twener

Authorized for release by: 6/24/2022 2:50:17 PM

Shelby Turner, Project Manager I

(303)736-0100

Shelby.Turner@et.eurofinsus.com

·····LINKS ·······

**Review your project** results through EOL

**Have a Question?** 



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www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	14
Chronicle	16
Certification Summary	18
Chain of Custody	19
Receipt Checklists	22

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### **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

### **Qualifiers**

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N	lΔ	ta	ıe

Qualifier **Qualifier Description** 

^6+ Interference Check Standard (ICSA and/or ICSAB) is outside acceptance limits, high biased.

### **Glossary**

Abbreviation These commonly used abbreviations may or may not be present in this repo
---

¤ Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery **CFL** Contains Free Liquid CFU Colony Forming Unit CNF Contains No Free Liquid

Duplicate Error Ratio (normalized absolute difference) **DER** 

Dil Fac **Dilution Factor** 

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

**EDL** Estimated Detection Limit (Dioxin) LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit MLMinimum Level (Dioxin) MPN Most Probable Number Method Quantitation Limit MQL

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

**PQL Practical Quantitation Limit** 

**PRES** Presumptive QC **Quality Control** 

Relative Error Ratio (Radiochemistry) **RER** 

Reporting Limit or Requested Limit (Radiochemistry) RL

**RPD** Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

Too Numerous To Count **TNTC** 

**Eurofins Denver** 

6/24/2022

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2

**Laboratory: Eurofins Denver** 

**Narrative** 

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - ND Sites - AVS Landfill

Report Number: 280-162908-2

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

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

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

#### **RECEIPT**

The samples were received on 5/31/2022 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 15.9° C.

The following samples were received at the laboratory outside the required temperature criteria at 15.9C: MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4). This does not meet regulatory requirements. It can be noted that metals and radiochemistry methods do not require thermal preservation. The only impacted methods are 9056A CL/FL/SO4 and 2540C TDS. The client was contacted on 5/31/22 regarding this issue, and the laboratory was instructed to cancel 9056A CL/FL/SO4 and 2540C TDS. The laboratory will only proceed with the requested metals and radiochemistry analyses. The client will recollect volume for Anions and TDS at a later date.

#### **TOTAL RECOVERABLE METALS**

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/20/2022 and analyzed on 06/21/2022 and 06/22/2022.

The low level continuing calibration verification (CCVL) associated with batch 280-578742 recovered above the upper control limit for Lithium. The samples associated with this CCV did not contain the affected analyte at a level greater than the reporting limit (RL); therefore, the data has been reported.

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

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

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for total metals (ICPMS) in accordance with EPA SW-846 6020A. The samples were prepared and analyzed on 06/08/2022.

The interference check standard solution (ICSA) associated with batch 280-577562 had results for one or more elements at a level greater than the RL. The initial ICSA result (3.46 ppb) was >2x RL of 1 ppb for Barium. The vendor acknowledges that these elements are trace impurities in the ICSA standard. These results are not indicative of a matrix interference.

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

Job ID: 280-162908-2

SDG: AVS Landfill New Wells

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#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

6

Job ID: 280-162908-2 (Continued)

**Laboratory: Eurofins Denver (Continued)** 

#### **TOTAL MERCURY**

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 06/08/2022 and analyzed on 06/09/2022.

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: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: MW-24S** 

Lab Sample ID: 280-162908-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	125		100		ug/L		_	6010C	Total
									Recoverable
Calcium	5070		200		ug/L	1		6010C	Total
									Recoverable
Lithium	61.3		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	82.7	^6+	1.00		ug/L	1		6020A	Total/NA
Chromium	3.54		2.00		ug/L	1		6020A	Total/NA
Cobalt	1.45		1.00		ug/L	1		6020A	Total/NA
Molybdenum	11.5		2.00		ug/L	1		6020A	Total/NA

**Client Sample ID: MW-22S** 

Lab Sample ID: 280-16290	<b>)</b> 8-2
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Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
143	100	ug/L		6010C	Total
					Recoverable
2430	200	ug/L	1	6010C	Total
					Recoverable
47.1	20.0	ug/L	1	6010C	Total
					Recoverable
64.6 ^6+	1.00	ug/L	1	6020A	Total/NA
	143 2430 47.1	143 100 2430 200 47.1 20.0	143 100 ug/L 2430 200 ug/L 47.1 20.0 ug/L	143 100 ug/L 1 2430 200 ug/L 1 47.1 20.0 ug/L 1	143 100 ug/L 1 6010C  2430 200 ug/L 1 6010C  47.1 20.0 ug/L 1 6010C

**Client Sample ID: MW-21S** 

# Lab Sample ID: 280-162908-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	140		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	5250		200		ug/L	1		6010C	Total
									Recoverable
Lithium	43.1		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	51.4	^6+	1.00		ug/L	1		6020A	Total/NA
Molybdenum	3.07		2.00		ug/L	1		6020A	Total/NA

**Client Sample ID: DUP** 

## Lab Sample ID: 280-162908-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	140		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	5240		200		ug/L	1		6010C	Total
									Recoverable
Lithium	41.6		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	48.1	^6+	1.00		ug/L	1		6020A	Total/NA
Molybdenum	2.95		2.00		ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

# **Method Summary**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN
6020A	Metals (ICP/MS)	SW846	TAL DEN
7470A	Mercury (CVAA)	SW846	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL DEN
3020A	Preparation, Total Metals	SW846	TAL DEN
7470A	Preparation, Mercury	SW846	TAL DEN

#### **Protocol References:**

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

#### Laboratory References:

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

# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-1	62908-2
SDG: AVS Landfill Ne	ew Wells

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-162908-1	MW-24S	Water	05/26/22 09:05	05/31/22 09:40
280-162908-2	MW-22S	Water	05/26/22 10:15	05/31/22 09:40
280-162908-3	MW-21S	Water	05/26/22 11:40	05/31/22 09:40
280-162908-4	DUP	Water	05/26/22 11:40	05/31/22 09:40

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

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

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1

Date Collected: 05/26/22 09:05 **Matrix: Water** Date Received: 05/31/22 09:40

RL **MDL** Unit D Dil Fac Analyte Result Qualifier Prepared Analyzed 100 06/20/22 08:27 Boron 125 ug/L 06/21/22 16:48 200 ug/L 06/20/22 08:27 06/21/22 16:48 **Calcium** 5070 Lithium 61.3 20.0 ug/L 06/20/22 08:27 06/22/22 14:54

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 100 ug/L 06/20/22 08:27 06/21/22 16:53 **Boron** 143 Calcium 200 06/20/22 08:27 06/21/22 16:53 2430 ug/L 20.0 ug/L 06/20/22 08:27 06/22/22 14:58 Lithium 47.1

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3 **Matrix: Water** 

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

**Analyte** Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 100 06/20/22 08:27 06/21/22 17:13 Boron 140 ug/L 5250 200 06/20/22 08:27 06/21/22 17:13 Calcium ug/L 20.0 06/20/22 08:27 06/22/22 15:02 Lithium 43.1 ug/L

Client Sample ID: DUP Lab Sample ID: 280-162908-4 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

**MDL** Unit Analyte RL Result Qualifier D Prepared Analyzed Dil Fac Boron 140 100 06/20/22 08:27 06/21/22 17:17 ug/L 200 ug/L 06/20/22 08:27 06/21/22 17:17 **Calcium** 5240 Lithium 41.6 20.0 ug/L 06/20/22 08:27 06/22/22 15:06

Method: 6020A - Metals (ICP/MS)

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1 Date Collected: 05/26/22 09:05 **Matrix: Water** Date Received: 05/31/22 09:40

**MDL** Unit D Analyte Result Qualifier RL Prepared Analyzed Dil Fac 2.00 Antimony ND ug/L 06/08/22 06:59 06/08/22 21:35 ND 5.00 06/08/22 21:35 Arsenic ug/L 06/08/22 06:59 1.00 06/08/22 06:59 06/08/22 21:35 **Barium** 82.7 ^6+ ug/L Beryllium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 Cadmium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 2 00 ug/L 06/08/22 06:59 06/08/22 21:35 **Chromium** 3.54 Cobalt 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 1.45 06/08/22 21:35 Lead ND 1.00 06/08/22 06:59 ug/L 2.00 ug/L 06/08/22 06:59 06/08/22 21:35 Molybdenum 11.5 Selenium ND 5.00 ug/L 06/08/22 06:59 06/08/22 21:35 Thallium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier RL MDI Unit Prepared Analyzed Dil Fac Antimony ND 2.00 ug/L 06/08/22 06:59 06/08/22 21:39

**Eurofins Denver** 

Page 9 of 22 6/24/2022 Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

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

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

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Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND ND	5.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Barium	64.6 ^6+	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Beryllium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Cadmium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Chromium	ND	2.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Cobalt	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Lead	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Molybdenum	ND	2.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Selenium	ND	5.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Thallium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
_							

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40										
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Arsenic	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Barium	51.4	^6+	1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Beryllium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Cadmium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Chromium	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Cobalt	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Lead	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Molybdenum	3.07		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Selenium	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	
Thallium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1	

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:4	10								
Analyte	Result C	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Arsenic	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Barium	48.1 ^	^6+	1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Beryllium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Cadmium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Chromium	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Cobalt	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Lead	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Molybdenum	2.95		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Selenium	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Thallium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1 Date Collected: 05/26/22 09:05 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier MDL Unit Prepared Analyzed Mercury ND 0.000200 06/08/22 16:33 06/09/22 17:04 mg/L

# **Client Sample Results**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2

Date Collected: 05/26/22 10:15 **Matrix: Water** Date Received: 05/31/22 09:40

Analyte RL **MDL** Unit D Prepared Dil Fac Result Qualifier Analyzed

Mercury ND 0.000200 06/08/22 16:33 06/09/22 17:07 mg/L

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3

Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40 **MDL** Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac

06/08/22 16:33 06/09/22 17:09 ND 0.000200 mg/L Mercury

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40 Result Qualifier RL **MDL** Unit Prepared

Analyte Analyzed mg/L 06/08/22 16:33 06/09/22 17:12 Mercury ND 0.000200

6/24/2022

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-578367/1-A

**Matrix: Water** 

**Analysis Batch: 578742** 

**Client Sample ID: Method Blank Prep Type: Total Recoverable Prep Batch: 578367** 

	1410	IVID							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100		ug/L		06/20/22 08:27	06/21/22 15:52	1
Calcium	ND		200		ug/L		06/20/22 08:27	06/21/22 15:52	1
Lithium	ND		20.0		ug/L		06/20/22 08:27	06/21/22 15:52	1

Added

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50000

1000

LCS LCS

2038

50550

1041

Result Qualifier Unit

ug/L

ug/L

ug/L

Lab Sample ID: LCS 280-578367/2-A

**Matrix: Water** 

Analyte

Calcium

Lithium

Boron

Analysis Batch: 578742 Spike

MD MD

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 578367

104

%Rec Limits D %Rec 86 - 110 102 101 90 - 111

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-577346/1-A

**Matrix: Water** 

Analysis Batch: 577562

90 - 112

**Prep Type: Total/NA** 

Prep Batch: 577346

Tillary Cio Datolli Ci i Col							op =atom.		
-	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Arsenic	ND		5.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Barium	ND	^6+	1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Beryllium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Cadmium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Chromium	ND		2.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Cobalt	ND		1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Lead	ND		1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Molybdenum	ND		2.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Selenium	ND		5.00		ug/L		06/08/22 06:59	06/08/22 20:39	1
Thallium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 20:39	1

Lab Sample ID: LCS 280-577346/2-A

**Matrix: Water** 

Analysis Batch: 577562

Client 9	Sami	ole ID	: Lab	Control	Sample

Prep Type: Total/NA

Prep Batch: 577346

Analysis Batch: 577562	Spike	LCS	LCS				%Rec
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Antimony	40.0	42.57		ug/L		106	85 - 115
Arsenic	40.0	39.50		ug/L		99	85 - 117
Barium	40.0	43.24	^6+	ug/L		108	85 - 118
Beryllium	40.0	40.83		ug/L		102	80 - 125
Cadmium	40.0	36.97		ug/L		92	85 - 115
Chromium	40.0	40.18		ug/L		100	84 - 121
Cobalt	40.0	39.71		ug/L		99	85 - 120
Lead	40.0	40.93		ug/L		102	85 - 118
Molybdenum	40.0	39.36		ug/L		98	85 - 119
Selenium	40.0	40.66		ug/L		102	77 - 122
Thallium	40.0	40.74		ug/L		102	85 - 118

# **QC Sample Results**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-577504/1-A **Client Sample ID: Method Blank** 

**Matrix: Water** 

**Prep Type: Total/NA Analysis Batch: 577670** Prep Batch: 577504

MB MB

**MDL** Unit Dil Fac Analyte Result Qualifier RL Prepared Analyzed <del>06/08/22 16:33</del> <del>06/09/22 16:31</del> Mercury ND 0.000200 mg/L

Lab Sample ID: LCS 280-577504/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Prep Batch: 577504 Analysis Batch: 577670** LCS LCS Spike %Rec

Analyte Added Result Qualifier Unit D %Rec Limits 84 - 120 0.00500 0.004861 97 Mercury mg/L

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

#### **Metals**

#### **Prep Batch: 577346**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	3020A	
280-162908-2	MW-22S	Total/NA	Water	3020A	
280-162908-3	MW-21S	Total/NA	Water	3020A	
280-162908-4	DUP	Total/NA	Water	3020A	
MB 280-577346/1-A	Method Blank	Total/NA	Water	3020A	
LCS 280-577346/2-A	Lab Control Sample	Total/NA	Water	3020A	

### **Prep Batch: 577504**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	7470A	
280-162908-2	MW-22S	Total/NA	Water	7470A	
280-162908-3	MW-21S	Total/NA	Water	7470A	
280-162908-4	DUP	Total/NA	Water	7470A	
MB 280-577504/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-577504/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 577562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	6020A	577346
280-162908-2	MW-22S	Total/NA	Water	6020A	577346
280-162908-3	MW-21S	Total/NA	Water	6020A	577346
280-162908-4	DUP	Total/NA	Water	6020A	577346
MB 280-577346/1-A	Method Blank	Total/NA	Water	6020A	577346
LCS 280-577346/2-A	Lab Control Sample	Total/NA	Water	6020A	577346

#### **Analysis Batch: 577670**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	7470A	577504
280-162908-2	MW-22S	Total/NA	Water	7470A	577504
280-162908-3	MW-21S	Total/NA	Water	7470A	577504
280-162908-4	DUP	Total/NA	Water	7470A	577504
MB 280-577504/1-A	Method Blank	Total/NA	Water	7470A	577504
LCS 280-577504/2-A	Lab Control Sample	Total/NA	Water	7470A	577504

#### **Prep Batch: 578367**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total Recoverable	Water	3005A	
280-162908-2	MW-22S	Total Recoverable	Water	3005A	
280-162908-3	MW-21S	Total Recoverable	Water	3005A	
280-162908-4	DUP	Total Recoverable	Water	3005A	
MB 280-578367/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-578367/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 578742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total Recoverable	Water	6010C	578367
280-162908-2	MW-22S	Total Recoverable	Water	6010C	578367
280-162908-3	MW-21S	Total Recoverable	Water	6010C	578367
280-162908-4	DUP	Total Recoverable	Water	6010C	578367
MB 280-578367/1-A	Method Blank	Total Recoverable	Water	6010C	578367
LCS 280-578367/2-A	Lab Control Sample	Total Recoverable	Water	6010C	578367

**Eurofins Denver** 

6/24/2022

Page 14 of 22

2

6

8

10

13

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

#### Job ID: 280-162908-2 SDG: AVS Landfill New Wells

#### **Metals**

#### Analysis Batch: 578890

1	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	280-162908-1	MW-24S	Total Recoverable	Water	6010C	578367
:	280-162908-2	MW-22S	Total Recoverable	Water	6010C	578367
:	280-162908-3	MW-21S	Total Recoverable	Water	6010C	578367
:	280-162908-4	DUP	Total Recoverable	Water	6010C	578367

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Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: MW-24S** 

Date Collected: 05/26/22 09:05 Date Received: 05/31/22 09:40

Lab Sample ID: 280-162908-1

**Matrix: Water** 

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 16:48	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 14:54	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:35	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:04	CEH	TAL DEN

Lab Sample ID: 280-162908-2

**Client Sample ID: MW-22S** Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 16:53	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 14:58	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:39	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:07	CEH	TAL DEN

Lab Sample ID: 280-162908-3 **Client Sample ID: MW-21S** Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 17:13	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 15:02	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:43	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:09	CEH	TAL DEN

Client Sample ID: DUP Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 17:17	MAB	TAL DEN

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Page 16 of 22

**Matrix: Water** 

#### **Lab Chronicle**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 **Matrix: Water** Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 15:06	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:47	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:12	CEH	TAL DEN

#### Laboratory References:

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

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

## **Laboratory: Eurofins Denver**

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

Authority	Pro	ogram	Identification Number	Expiration Date		
North Dakota	Sta	nte	R-034	01-08-23		
The following analyte	s are included in this reno	rt but the laboratory is r	not certified by the governing authority	This list may include analytes for w		
The following analyte the agency does not	•	rt, but the laboratory is r	not certified by the governing authority.	This list may include analytes for w		
• ,	•	rt, but the laboratory is r Matrix	not certified by the governing authority.  Analyte	This list may include analytes for w		





# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-162908-2 SDG Number: AVS Landfill New Wells

**List Source: Eurofins Denver** 

Login Number: 162908

List Number: 1

Creator: Kazenga, Oliver M

Creator: Kazenga, Oliver W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	N/A	
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	





# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-162908-2

Laboratory Sample Delivery Group: AVS Landfill New Wells Client Project/Site: CCR Groundwater - ND Sites - AVS Landfill

#### For:

eurofins 🙀

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelby Twener

Authorized for release by: 6/24/2022 2:50:17 PM

Shelby Turner, Project Manager I

(303)736-0100

Shelby.Turner@et.eurofinsus.com

·····LINKS ·······

**Review your project** results through EOL

**Have a Question?** 



Visit us at: www.eurofinsus.com/Env The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	14
Chronicle	16
Certification Summary	18
Chain of Custody	19
Receipt Checklists	22

4

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9

10

12

13

## **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

#### **Qualifiers**

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Qualifier **Qualifier Description** 

^6+ Interference Check Standard (ICSA and/or ICSAB) is outside acceptance limits, high biased.

#### **Glossary**

Abbreviation These commonly used abbreviations may or may not be present in this repo
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¤ Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery **CFL** Contains Free Liquid CFU Colony Forming Unit CNF Contains No Free Liquid

Duplicate Error Ratio (normalized absolute difference) **DER** 

Dil Fac **Dilution Factor** 

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

**EDL** Estimated Detection Limit (Dioxin) LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit MLMinimum Level (Dioxin) MPN Most Probable Number Method Quantitation Limit MQL

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

**PQL Practical Quantitation Limit** 

**PRES** Presumptive QC **Quality Control** 

Relative Error Ratio (Radiochemistry) **RER** 

Reporting Limit or Requested Limit (Radiochemistry) RL

**RPD** Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

Too Numerous To Count **TNTC** 

**Eurofins Denver** 

6/24/2022

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2

**Laboratory: Eurofins Denver** 

**Narrative** 

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - ND Sites - AVS Landfill

Report Number: 280-162908-2

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

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

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

#### **RECEIPT**

The samples were received on 5/31/2022 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 15.9° C.

The following samples were received at the laboratory outside the required temperature criteria at 15.9C: MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4). This does not meet regulatory requirements. It can be noted that metals and radiochemistry methods do not require thermal preservation. The only impacted methods are 9056A CL/FL/SO4 and 2540C TDS. The client was contacted on 5/31/22 regarding this issue, and the laboratory was instructed to cancel 9056A CL/FL/SO4 and 2540C TDS. The laboratory will only proceed with the requested metals and radiochemistry analyses. The client will recollect volume for Anions and TDS at a later date.

#### **TOTAL RECOVERABLE METALS**

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 06/20/2022 and analyzed on 06/21/2022 and 06/22/2022.

The low level continuing calibration verification (CCVL) associated with batch 280-578742 recovered above the upper control limit for Lithium. The samples associated with this CCV did not contain the affected analyte at a level greater than the reporting limit (RL); therefore, the data has been reported.

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

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

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for total metals (ICPMS) in accordance with EPA SW-846 6020A. The samples were prepared and analyzed on 06/08/2022.

The interference check standard solution (ICSA) associated with batch 280-577562 had results for one or more elements at a level greater than the RL. The initial ICSA result (3.46 ppb) was >2x RL of 1 ppb for Barium. The vendor acknowledges that these elements are trace impurities in the ICSA standard. These results are not indicative of a matrix interference.

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

Job ID: 280-162908-2

SDG: AVS Landfill New Wells

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#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

6

Job ID: 280-162908-2 (Continued)

**Laboratory: Eurofins Denver (Continued)** 

#### **TOTAL MERCURY**

Samples MW-24S (280-162908-1), MW-22S (280-162908-2), MW-21S (280-162908-3) and DUP (280-162908-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 06/08/2022 and analyzed on 06/09/2022.

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: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: MW-24S** 

Lab Sample ID: 280-162908-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	125		100		ug/L		_	6010C	Total
									Recoverable
Calcium	5070		200		ug/L	1		6010C	Total
									Recoverable
Lithium	61.3		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	82.7	^6+	1.00		ug/L	1		6020A	Total/NA
Chromium	3.54		2.00		ug/L	1		6020A	Total/NA
Cobalt	1.45		1.00		ug/L	1		6020A	Total/NA
Molybdenum	11.5		2.00		ug/L	1		6020A	Total/NA

**Client Sample ID: MW-22S** 

Lab Sample ID: 280-16290	<b>)</b> 8-2
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Result Qualifier	RL	MDL Unit	Dil Fac D	Method	Prep Type
143	100	ug/L		6010C	Total
					Recoverable
2430	200	ug/L	1	6010C	Total
					Recoverable
47.1	20.0	ug/L	1	6010C	Total
					Recoverable
64.6 ^6+	1.00	ug/L	1	6020A	Total/NA
	143 2430 47.1	143 100 2430 200 47.1 20.0	143 100 ug/L 2430 200 ug/L 47.1 20.0 ug/L	143 100 ug/L 1 2430 200 ug/L 1 47.1 20.0 ug/L 1	143 100 ug/L 1 6010C  2430 200 ug/L 1 6010C  47.1 20.0 ug/L 1 6010C

**Client Sample ID: MW-21S** 

# Lab Sample ID: 280-162908-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	140		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	5250		200		ug/L	1		6010C	Total
									Recoverable
Lithium	43.1		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	51.4	^6+	1.00		ug/L	1		6020A	Total/NA
Molybdenum	3.07		2.00		ug/L	1		6020A	Total/NA

**Client Sample ID: DUP** 

## Lab Sample ID: 280-162908-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	140		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	5240		200		ug/L	1		6010C	Total
									Recoverable
Lithium	41.6		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	48.1	^6+	1.00		ug/L	1		6020A	Total/NA
Molybdenum	2.95		2.00		ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

# **Method Summary**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	TAL DEN
6020A	Metals (ICP/MS)	SW846	TAL DEN
7470A	Mercury (CVAA)	SW846	TAL DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	TAL DEN
3020A	Preparation, Total Metals	SW846	TAL DEN
7470A	Preparation, Mercury	SW846	TAL DEN

#### **Protocol References:**

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

#### Laboratory References:

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

# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-1	62908-2
SDG: AVS Landfill Ne	ew Wells

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-162908-1	MW-24S	Water	05/26/22 09:05	05/31/22 09:40
280-162908-2	MW-22S	Water	05/26/22 10:15	05/31/22 09:40
280-162908-3	MW-21S	Water	05/26/22 11:40	05/31/22 09:40
280-162908-4	DUP	Water	05/26/22 11:40	05/31/22 09:40

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

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

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1

Date Collected: 05/26/22 09:05 **Matrix: Water** Date Received: 05/31/22 09:40

RL **MDL** Unit D Dil Fac Analyte Result Qualifier Prepared Analyzed 100 06/20/22 08:27 Boron 125 ug/L 06/21/22 16:48 200 ug/L 06/20/22 08:27 06/21/22 16:48 **Calcium** 5070 Lithium 61.3 20.0 ug/L 06/20/22 08:27 06/22/22 14:54

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac 100 ug/L 06/20/22 08:27 06/21/22 16:53 **Boron** 143 Calcium 200 06/20/22 08:27 06/21/22 16:53 2430 ug/L 20.0 ug/L 06/20/22 08:27 06/22/22 14:58 Lithium 47.1

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3 **Matrix: Water** 

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

**Analyte** Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 100 06/20/22 08:27 06/21/22 17:13 Boron 140 ug/L 5250 200 06/20/22 08:27 06/21/22 17:13 Calcium ug/L 20.0 06/20/22 08:27 06/22/22 15:02 Lithium 43.1 ug/L

Client Sample ID: DUP Lab Sample ID: 280-162908-4 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

**MDL** Unit Analyte RL Result Qualifier D Prepared Analyzed Dil Fac Boron 140 100 06/20/22 08:27 06/21/22 17:17 ug/L 200 ug/L 06/20/22 08:27 06/21/22 17:17 **Calcium** 5240 Lithium 41.6 20.0 ug/L 06/20/22 08:27 06/22/22 15:06

Method: 6020A - Metals (ICP/MS)

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1 Date Collected: 05/26/22 09:05 **Matrix: Water** Date Received: 05/31/22 09:40

**MDL** Unit D Analyte Result Qualifier RL Prepared Analyzed Dil Fac 2.00 Antimony ND ug/L 06/08/22 06:59 06/08/22 21:35 ND 5.00 06/08/22 21:35 Arsenic ug/L 06/08/22 06:59 1.00 06/08/22 06:59 06/08/22 21:35 **Barium** 82.7 ^6+ ug/L Beryllium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 Cadmium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 2 00 ug/L 06/08/22 06:59 06/08/22 21:35 **Chromium** 3.54 Cobalt 1.00 ug/L 06/08/22 06:59 06/08/22 21:35 1.45 06/08/22 21:35 Lead ND 1.00 06/08/22 06:59 ug/L 2.00 ug/L 06/08/22 06:59 06/08/22 21:35 Molybdenum 11.5 Selenium ND 5.00 ug/L 06/08/22 06:59 06/08/22 21:35 Thallium ND 1.00 ug/L 06/08/22 06:59 06/08/22 21:35

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier RL MDI Unit Prepared Analyzed Dil Fac Antimony ND 2.00 ug/L 06/08/22 06:59 06/08/22 21:39

**Eurofins Denver** 

Page 9 of 22 6/24/2022 Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

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

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2 Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

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Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND ND	5.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Barium	64.6 ^6+	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Beryllium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Cadmium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Chromium	ND	2.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Cobalt	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Lead	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Molybdenum	ND	2.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Selenium	ND	5.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
Thallium	ND	1.00	ug/L		06/08/22 06:59	06/08/22 21:39	1
_							

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22	2 09:40								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Arsenic	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Barium	51.4	^6+	1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Beryllium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Cadmium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Chromium	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Cobalt	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Lead	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Molybdenum	3.07		2.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Selenium	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:43	1
Thallium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:43	1

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4 Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:4	10								
Analyte	Result C	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Arsenic	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Barium	48.1 ^	^6+	1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Beryllium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Cadmium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Chromium	ND		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Cobalt	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Lead	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Molybdenum	2.95		2.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Selenium	ND		5.00		ug/L		06/08/22 06:59	06/08/22 21:47	1
Thallium	ND		1.00		ug/L		06/08/22 06:59	06/08/22 21:47	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-24S Lab Sample ID: 280-162908-1 Date Collected: 05/26/22 09:05 **Matrix: Water** 

Date Received: 05/31/22 09:40

Analyte Result Qualifier MDL Unit Prepared Analyzed Mercury ND 0.000200 06/08/22 16:33 06/09/22 17:04 mg/L

## **Client Sample Results**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-22S Lab Sample ID: 280-162908-2

Date Collected: 05/26/22 10:15 **Matrix: Water** Date Received: 05/31/22 09:40

Analyte RL **MDL** Unit D Prepared Dil Fac Result Qualifier Analyzed

Mercury ND 0.000200 06/08/22 16:33 06/09/22 17:07 mg/L

Client Sample ID: MW-21S Lab Sample ID: 280-162908-3

Date Collected: 05/26/22 11:40 **Matrix: Water** Date Received: 05/31/22 09:40

**MDL** Unit Analyte Result Qualifier RL D Prepared Analyzed Dil Fac 06/08/22 16:33 06/09/22 17:09 ND 0.000200 mg/L Mercury

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 **Matrix: Water** Date Received: 05/31/22 09:40

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed mg/L 06/08/22 16:33 06/09/22 17:12 Mercury ND 0.000200

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-578367/1-A

**Matrix: Water** 

**Analysis Batch: 578742** 

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

**Prep Batch: 578367** 

	MB	MB							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100		ug/L		06/20/22 08:27	06/21/22 15:52	1
Calcium	ND		200		ug/L		06/20/22 08:27	06/21/22 15:52	1
Lithium	ND		20.0		ug/L		06/20/22 08:27	06/21/22 15:52	1

Lab Sample ID: LCS 280-578367/2-A

**Matrix: Water** 

**Analysis Batch: 578742** 

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

**Prep Batch: 578367** 

	Spik	ie LCS	LCS		%Rec	
Analyte	Adde	d Result	Qualifier Unit	t D %Rec	Limits	
Boron	200	2038	ug/L		86 - 110	
Calcium	5000	00 50550	ug/L	_ 101	90 - 111	
Lithium	100	00 1041	ug/L	_ 104	90 - 112	
Lithium	100	0 1041	ug/L	. 104	90 - 112	

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-577346/1-A

**Matrix: Water** 

Analysis Batch: 577562

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 577346** 

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac ND 2.00 06/08/22 06:59 06/08/22 20:39 Antimony ug/L ND 06/08/22 06:59 06/08/22 20:39 Arsenic 5.00 ug/L Barium ND ^6+ 1.00 ug/L 06/08/22 06:59 06/08/22 20:39 Beryllium ND 1.00 ug/L 06/08/22 06:59 06/08/22 20:39 Cadmium ND 1.00 ug/L 06/08/22 06:59 06/08/22 20:39 Chromium ND 2.00 ug/L 06/08/22 06:59 06/08/22 20:39 06/08/22 06:59 06/08/22 20:39 Cobalt ND 1.00 ug/L Lead ND 1.00 ug/L 06/08/22 06:59 06/08/22 20:39 ND 2.00 ug/L Molybdenum 06/08/22 06:59 06/08/22 20:39 Selenium ND 5.00 ug/L 06/08/22 06:59 06/08/22 20:39 Thallium ND 1.00 ug/L 06/08/22 06:59 06/08/22 20:39

Lab Sample ID: LCS 280-577346/2-A

**Matrix: Water** 

**Analysis Batch: 577562** 

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Prep Batch: 577346

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	Spike	LCS	LCS				%Rec
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits
Antimony	40.0	42.57		ug/L		106	85 - 115
Arsenic	40.0	39.50		ug/L		99	85 - 117
Barium	40.0	43.24	^6+	ug/L		108	85 - 118
Beryllium	40.0	40.83		ug/L		102	80 - 125
Cadmium	40.0	36.97		ug/L		92	85 - 115
Chromium	40.0	40.18		ug/L		100	84 - 121
Cobalt	40.0	39.71		ug/L		99	85 - 120
Lead	40.0	40.93		ug/L		102	85 - 118
Molybdenum	40.0	39.36		ug/L		98	85 - 119
Selenium	40.0	40.66		ug/L		102	77 - 122
Thallium	40.0	40.74		ug/L		102	85 - 118

# **QC Sample Results**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-577504/1-A **Client Sample ID: Method Blank** 

**Matrix: Water** 

**Prep Type: Total/NA Analysis Batch: 577670** Prep Batch: 577504

MB MB

**MDL** Unit Dil Fac Analyte Result Qualifier RL Prepared Analyzed <del>06/08/22 16:33</del> <del>06/09/22 16:31</del> Mercury ND 0.000200 mg/L

Lab Sample ID: LCS 280-577504/2-A **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Prep Batch: 577504 Analysis Batch: 577670** LCS LCS Spike %Rec

Analyte Added Result Qualifier Unit D %Rec Limits 84 - 120 0.00500 0.004861 97 Mercury mg/L

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

#### **Metals**

#### **Prep Batch: 577346**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	3020A	
280-162908-2	MW-22S	Total/NA	Water	3020A	
280-162908-3	MW-21S	Total/NA	Water	3020A	
280-162908-4	DUP	Total/NA	Water	3020A	
MB 280-577346/1-A	Method Blank	Total/NA	Water	3020A	
LCS 280-577346/2-A	Lab Control Sample	Total/NA	Water	3020A	

### **Prep Batch: 577504**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	7470A	
280-162908-2	MW-22S	Total/NA	Water	7470A	
280-162908-3	MW-21S	Total/NA	Water	7470A	
280-162908-4	DUP	Total/NA	Water	7470A	
MB 280-577504/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-577504/2-A	Lab Control Sample	Total/NA	Water	7470A	

### Analysis Batch: 577562

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	6020A	577346
280-162908-2	MW-22S	Total/NA	Water	6020A	577346
280-162908-3	MW-21S	Total/NA	Water	6020A	577346
280-162908-4	DUP	Total/NA	Water	6020A	577346
MB 280-577346/1-A	Method Blank	Total/NA	Water	6020A	577346
LCS 280-577346/2-A	Lab Control Sample	Total/NA	Water	6020A	577346

#### **Analysis Batch: 577670**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total/NA	Water	7470A	577504
280-162908-2	MW-22S	Total/NA	Water	7470A	577504
280-162908-3	MW-21S	Total/NA	Water	7470A	577504
280-162908-4	DUP	Total/NA	Water	7470A	577504
MB 280-577504/1-A	Method Blank	Total/NA	Water	7470A	577504
LCS 280-577504/2-A	Lab Control Sample	Total/NA	Water	7470A	577504

#### **Prep Batch: 578367**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-162908-1	MW-24S	Total Recoverable	Water	3005A	
280-162908-2	MW-22S	Total Recoverable	Water	3005A	
280-162908-3	MW-21S	Total Recoverable	Water	3005A	
280-162908-4	DUP	Total Recoverable	Water	3005A	
MB 280-578367/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-578367/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### Analysis Batch: 578742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch	
280-162908-1	MW-24S	Total Recoverable	Water	6010C	578367	
280-162908-2	MW-22S	Total Recoverable	Water	6010C	578367	
280-162908-3	MW-21S	Total Recoverable	Water	6010C	578367	
280-162908-4	DUP	Total Recoverable	Water	6010C	578367	
MB 280-578367/1-A	Method Blank	Total Recoverable	Water	6010C	578367	
LCS 280-578367/2-A	Lab Control Sample	Total Recoverable	Water	6010C	578367	

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6/24/2022

Page 14 of 22

2

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10

13

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

#### Job ID: 280-162908-2 SDG: AVS Landfill New Wells

#### **Metals**

#### Analysis Batch: 578890

1	Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
	280-162908-1	MW-24S	Total Recoverable	Water	6010C	578367
:	280-162908-2	MW-22S	Total Recoverable	Water	6010C	578367
:	280-162908-3	MW-21S	Total Recoverable	Water	6010C	578367
:	280-162908-4	DUP	Total Recoverable	Water	6010C	578367

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Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: MW-24S** 

Date Collected: 05/26/22 09:05 Date Received: 05/31/22 09:40

Lab Sample ID: 280-162908-1

**Matrix: Water** 

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 16:48	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 14:54	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:35	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:04	CEH	TAL DEN

Lab Sample ID: 280-162908-2

**Client Sample ID: MW-22S** Date Collected: 05/26/22 10:15 **Matrix: Water** 

Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 16:53	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 14:58	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:39	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:07	CEH	TAL DEN

Lab Sample ID: 280-162908-3 **Client Sample ID: MW-21S** Date Collected: 05/26/22 11:40 **Matrix: Water** 

Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 17:13	MAB	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 15:02	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:43	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:09	CEH	TAL DEN

Client Sample ID: DUP Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578742	06/21/22 17:17	MAB	TAL DEN

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Page 16 of 22

**Matrix: Water** 

#### **Lab Chronicle**

Client: Basin Electric Power Cooperative

Job ID: 280-162908-2 Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill New Wells

**Client Sample ID: DUP** Lab Sample ID: 280-162908-4

Date Collected: 05/26/22 11:40 **Matrix: Water** Date Received: 05/31/22 09:40

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	578367	06/20/22 08:27	PFM	TAL DEN
Total Recoverable	Analysis	6010C		1			578890	06/22/22 15:06	MAB	TAL DEN
Total/NA	Prep	3020A			50 mL	50 mL	577346	06/08/22 06:59	MAB	TAL DEN
Total/NA	Analysis	6020A		1			577562	06/08/22 21:47	LMT	TAL DEN
Total/NA	Prep	7470A			30 mL	50 mL	577504	06/08/22 16:33	CEH	TAL DEN
Total/NA	Analysis	7470A		1			577670	06/09/22 17:12	CEH	TAL DEN

#### Laboratory References:

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

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-162908-2 SDG: AVS Landfill New Wells

## **Laboratory: Eurofins Denver**

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

Authority	Pro	ogram	Identification Number	Expiration Date
North Dakota	Sta	nte	R-034	01-08-23
The following analyte	s are included in this reno	rt but the laboratory is r	not certified by the governing authority	This list may include analytes for w
The following analyte the agency does not	•	rt, but the laboratory is r	not certified by the governing authority.	This list may include analytes for w
• ,	•	rt, but the laboratory is r Matrix	not certified by the governing authority.  Analyte	This list may include analytes for w





## **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-162908-2 SDG Number: AVS Landfill New Wells

**List Source: Eurofins Denver** 

Login Number: 162908

List Number: 1

Creator: Kazenga, Oliver M

Creator: Kazenga, Oliver W		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	False	Water present in cooler; indicates evidence of melted ice.
Cooler Temperature is acceptable.	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	False	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	N/A	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

**Eurofins Denver** 



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# **Environment Testing America**

# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-164440-1

Laboratory Sample Delivery Group: AVS Landfill

Client Project/Site: CCR Groundwater - ND Sites - AVS Landfill

For:

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelly Turner

Authorized for release by: 7/27/2022 11:38:42 AM

Shelby Turner, Project Manager I (303)736-0100

Shelby.Turner@et.eurofinsus.com

.....LINKS .....

Review your project results through

**Have a Question?** 



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The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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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9

10

12

13

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	5
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	15
Chronicle	17
Certification Summary	19
Chain of Custody	20
Receipt Checklists	21

4

6

8

9

11

12

13

## **Definitions/Glossary**

Client: Basin Electric Power Cooperative Job ID: 280-164440-1

Project/Site: CCR Groundwater - ND Sites - AVS Landfill SDG: AVS Landfill

## Glossary

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Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit ML Minimum Level (Dioxin) Most Probable Number MPN MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

Negative / Absent NEG POS Positive / Present

PQL **Practical Quantitation Limit** 

**PRES** Presumptive QC **Quality Control** 

**RER** Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points **RPD** 

**TEF** Toxicity Equivalent Factor (Dioxin) Toxicity Equivalent Quotient (Dioxin) TEQ

**TNTC** Too Numerous To Count

**Eurofins Denver** 

7/27/2022

Page 3 of 21

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

Job ID: 280-164440-1

**Laboratory: Eurofins Denver** 

Narrative

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - ND Sites - AVS Landfill

Report Number: 280-164440-1

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 7/15/2022 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.9° C.

#### **TOTAL RECOVERABLE METALS**

Samples MW-15S (280-164440-1), MW-16S (280-164440-2), MW-17S (280-164440-3), MW-18S (280-164440-4), MW-19S (280-164440-5), MW-20S (280-164440-6) and DUP (280-164440-7) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 07/25/2022 and analyzed on 07/25/2022 and 07/26/2022.

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

#### **TOTAL DISSOLVED SOLIDS**

Samples MW-15S (280-164440-1), MW-16S (280-164440-2), MW-17S (280-164440-3), MW-18S (280-164440-4), MW-19S (280-164440-5), MW-20S (280-164440-6) and DUP (280-164440-7) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 07/19/2022.

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

#### ANIONS (28 DAYS)

Samples MW-15S (280-164440-1), MW-16S (280-164440-2), MW-17S (280-164440-3), MW-18S (280-164440-4), MW-19S (280-164440-5), MW-20S (280-164440-6) and DUP (280-164440-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A (28 Days). The samples were analyzed on 07/16/2022 and 07/19/2022.

Samples MW-15S (280-164440-1)[5X], MW-17S (280-164440-3)[5X], MW-18S (280-164440-4)[5X], MW-19S (280-164440-5)[5X] and DUP (280-164440-7)[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.

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Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

Client Sample ID: MW-15S	Lab Sample ID: 280-164440-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	147		100		ug/L		_	6010C	Total
									Recoverable
Calcium	5370		200		ug/L	1		6010C	Total
									Recoverable
Chloride	10.4		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.44		0.500		mg/L	1		9056A	Total/NA
Sulfate	402		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1820		20.0		mg/L	1		SM 2540C	Total/NA

## **Client Sample ID: MW-16S**

# Lab Sample ID: 280-164440-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	188		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	2210		200		ug/L	1		6010C	Total
									Recoverable
Chloride	20.0		3.00		mg/L	1		9056A	Total/NA
Fluoride	1.72		0.500		mg/L	1		9056A	Total/NA
Sulfate	77.0		5.00		mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	816		20.0		mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-17S

# Lab Sample ID: 280-164440-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	147		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	3880		200		ug/L	1		6010C	Total
									Recoverable
Chloride	9.71		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.24		0.500		mg/L	1		9056A	Total/NA
Sulfate	257		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1660		20.0		mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-18S

## Lab Sample ID: 280-164440-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	119		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	4920		200		ug/L	1		6010C	Total
									Recoverable
Chloride	5.06		3.00		mg/L	1		9056A	Total/NA
Fluoride	3.93		0.500		mg/L	1		9056A	Total/NA
Sulfate	521		25.0		mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1680		20.0		mg/L	1		SM 2540C	Total/NA

## Client Sample ID: MW-19S

## Lab Sample ID: 280-164440-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	157		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	3990		200		ug/L	1		6010C	Total
									Recoverable
Chloride	13.8		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.15		0.500		mg/L	1		9056A	Total/NA
Sulfate	892		25.0		mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

**Eurofins Denver** 

7/27/2022

## **Detection Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1

Lab Sample ID: 280-164440-5

Lab Sample ID: 280-164440-7

SDG: AVS Landfill

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Analyte	Result Qualifier	RL	MDL Unit	Dil Fac D Method	Prep Type
Total Dissolved Solids (TDS)	2070	20.0	mg/L	1 SM 2540C	Total/NA

#### **Client Sample ID: MW-20S** Lab Sample ID: 280-164440-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	140		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	5250		200		ug/L	1		6010C	Total
									Recoverable
Chloride	21.6		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.52		0.500		mg/L	1		9056A	Total/NA
Sulfate	78.5		5.00		mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	1790		20.0		mg/L	1		SM 2540C	Total/NA

## **Client Sample ID: DUP**

Analyte	Result Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	151	100		ug/L	1	_	6010C	Total
								Recoverable
Calcium	3980	200		ug/L	1		6010C	Total
								Recoverable
Chloride	14.0	3.00	1	mg/L	1		9056A	Total/NA
Fluoride	4.15	0.500		mg/L	1		9056A	Total/NA
Sulfate	881	25.0	1	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	45500	1000	1	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

## **Method Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1

Laboratory

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

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### Laboratory References:

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

# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - ND Sites - AVS Landfill Job ID: 280-164440-1 SDG: AVS Landfill

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-164440-1	MW-15S	Water	07/13/22 08:40	07/15/22 09:50
280-164440-2	MW-16S	Water	07/13/22 12:00	07/15/22 09:50
280-164440-3	MW-17S	Water	07/13/22 12:25	07/15/22 09:50
280-164440-4	MW-18S	Water	07/13/22 10:45	07/15/22 09:50
280-164440-5	MW-19S	Water	07/13/22 11:40	07/15/22 09:50
280-164440-6	MW-20S	Water	07/13/22 13:25	07/15/22 09:50
280-164440-7	DUP	Water	07/13/22 11:40	07/15/22 09:50

Client Sample ID: DUP

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

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

Job ID: 280-164440-1

SDG: AVS Landfill

Date Collected: 07/13/22 08:40							Lab Sam	ple ID: 280-16 Matrix:	4440-1 Water
Date Received: 07/15/22 09:50 Analyte	Result	Qualifier	RL	MDI	Unit	D	Prepared	Analyzed	Dil Fac
Boron	147	Quanner	100	INDL	ug/L			07/26/22 10:31	1
Calcium	5370		200		ug/L		07/25/22 10:15	07/25/22 19:52	1
Client Sample ID: MW-16S Date Collected: 07/13/22 12:00 Date Received: 07/15/22 09:50							Lab Sam	ple ID: 280-16 Matrix	4440-2 Water
Analyte Boron	Result	Qualifier	RL 100	MDL	Unit ug/L	<u>D</u>	Prepared 07/25/22 10:15	Analyzed 07/26/22 10:35	Dil Fac

Calcium	2210	200	ug/L	07/25/22 10:15	07/25/22 19:56	1
Client Sample ID: MW-17S Date Collected: 07/13/22 12:29 Date Received: 07/15/22 09:50				Lab Sam	ple ID: 280-16 Matrix	34440-3 : Water
Analyte	Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
Boron	147	100	ug/L	07/25/22 10:15	07/26/22 10:39	1
Calcium	3880	200	ug/L	07/25/22 10:15	07/25/22 20:00	1
Client Sample ID: MW-18S				Lab Sam	ple ID: 280-16	4440-4 Water

Date Collected: 07/13/22 10:45								Matrix	vvater
Date Received: 07/15/22 09:50 Analyte		Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	119	<u> </u>	100		ug/L			07/26/22 10:43	1
Calcium	4920		200		ug/L		07/25/22 10:15	07/25/22 20:04	1

Client Sample ID: MW-19S Date Collected: 07/13/22 11:40 Date Received: 07/15/22 09:50						Lab Sample ID: 280-164440-5 Matrix: Water			
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac		
Boron	157	100	ug/L		07/25/22 10:15	07/26/22 10:47	1		
Calcium	3990	200	ug/L		07/25/22 10:15	07/25/22 20:08	1		

Client Sample ID: MW-20S Date Collected: 07/13/22 1 Date Received: 07/15/22 0	3:25					Lab Sam <sub>l</sub>	ole ID: 280-16 Matrix	4440-6 Water
Analyte	Result Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	140	100		ug/L		07/25/22 10:15	07/26/22 10:51	1
Calcium	5250	200		ug/L		07/25/22 10:15	07/25/22 20:12	1

Date Collected: 07/13/						Matrix	Water
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Boron	151	100	ug/L		07/25/22 10:15	07/26/22 10:55	1
Calcium	3980	200	ug/L		07/25/22 10:15	07/25/22 20:16	1

Lab Sample ID: 280-164440-7

# **Client Sample Results**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

## **General Chemistry**

Client Sample ID: MW-15S Date Collected: 07/13/22 08:40 Date Received: 07/15/22 09:50						Lab San	iple ID: 280-16 Matrix	34440-1 : Water
Analyte	Result Qualifier	RL	MDL Un	nit	D	Prepared	Analyzed	Dil Fac
Chloride	10.4	3.00	mg	g/L			07/16/22 18:24	1
Fluoride	4.44	0.500	mg	g/L			07/16/22 18:24	1
Sulfate	402	25.0	mg	g/L			07/16/22 18:39	5
_Total Dissolved Solids (TDS)	1820	20.0	mg	g/L			07/19/22 10:32	1
<del>-</del> .								

Client Sample ID: MW-165					Lab Sam	pie iD: 280-1	64440-2
Date Collected: 07/13/22 12:00						Matrix	k: Water
Date Received: 07/15/22 09:50							
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac

	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Chloride	20.0		3.00		mg/L			07/16/22 18:55	1
	Fluoride	1.72		0.500		mg/L			07/16/22 18:55	1
	Sulfate	77.0		5.00		mg/L			07/16/22 18:55	1
l	Total Dissolved Solids (TDS)	816		20.0		mg/L			07/19/22 10:31	1

Client Sample ID: MW-17S					Lab Sam	ple ID: 280-1	64440-3
Date Collected: 07/13/22 12:25						Matrix	x: Water
Date Received: 07/15/22 09:50							
Analyto	Popult Qualifier	DI	MDI Unit	n	Dropared	Analyzod	Dil Eac

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.71	3.00	mg/L	<del></del> _		07/16/22 19:43	1
Fluoride	4.24	0.500	mg/L			07/16/22 19:43	1
Sulfate	257	25.0	mg/L			07/19/22 04:07	5
Total Dissolved Solids (TDS)	1660	20.0	mg/L			07/19/22 10:31	1

Client Sample ID: MW-18S	Lab Sample ID: 280-164440-4
Date Collected: 07/13/22 10:45	Matrix: Water
Date Received: 07/15/22 09:50	

Date Neceived. 01/10/22 03:00								
Analyte	Result (	Qualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	5.06	3.00		mg/L			07/16/22 19:59	1
Fluoride	3.93	0.500		mg/L			07/16/22 19:59	1
Sulfate	521	25.0		mg/L			07/16/22 20:14	5
Total Dissolved Solids (TDS)	1680	20.0		mg/L			07/19/22 10:32	1

Clic	ent Sample ID: MW-19S	Lab Sample ID: 280-164440-5
Dat	te Collected: 07/13/22 11:40	Matrix: Water

1	Date Received: 07/15/22 09:50									
4	Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Chloride	13.8		3.00		mg/L			07/16/22 20:30	1
	Fluoride	4.15		0.500		mg/L			07/16/22 20:30	1
:	Sulfate	892		25.0		mg/L			07/16/22 20:46	5
	Total Dissolved Solids (TDS)	2070		20.0		mg/L			07/19/22 10:32	1

Client Sample ID: MW-20S	Lab Sample ID: 280-164440-6
Date Collected: 07/13/22 13:25	Matrix: Water

Result Qualifier	RL	MDL Unit	D Prepared	Analyzed	Dil Fac
21.6	3.00	mg/L		07/16/22 21:02	1
4.52	0.500	mg/L		07/16/22 21:02	1
78.5	5.00	mg/L		07/16/22 21:02	1
1790	20.0	mg/L		07/19/22 10:32	1
	21.6 4.52 78.5	<b>21.6</b> 3.00 <b>4.52</b> 0.500 <b>78.5</b> 5.00	21.6     3.00     mg/L       4.52     0.500     mg/L       78.5     5.00     mg/L	21.6     3.00     mg/L       4.52     0.500     mg/L       78.5     5.00     mg/L	21.6     3.00     mg/L     07/16/22 21:02       4.52     0.500     mg/L     07/16/22 21:02       78.5     5.00     mg/L     07/16/22 21:02

**Eurofins Denver** 

# **Client Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1

SDG: AVS Landfill

## **General Chemistry**

Client Sample ID: DUP

Lab Sample ID: 280-164440-7

Pote Collected: 07/43/33 44440

Date Collected: 07/13/22 11:40 Matrix: Water

Date Received: 07/15/22 09:50									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	14.0		3.00		mg/L			07/16/22 21:18	1
Fluoride	4.15		0.500		mg/L			07/16/22 21:18	1
Sulfate	881		25.0		mg/L			07/16/22 21:34	5
Total Dissolved Solids (TDS)	45500		1000		mg/L			07/19/22 10:32	1
	Analyte Chloride Fluoride Sulfate	Analyte         Result           Chloride         14.0           Fluoride         4.15           Sulfate         881	Analyte Result Qualifier  Chloride 14.0  Fluoride 4.15  Sulfate 881	Analyte         Result Qualifier         RL           Chloride         14.0         3.00           Fluoride         4.15         0.500           Sulfate         881         25.0	Analyte         Result 14.0         Qualifier RL 3.00         MDL 3.00           Fluoride 5ulfate         4.15 0.500         0.500           Sulfate         881 25.0         25.0	Analyte         Result Oualifier         Qualifier         RL RL         MDL Unit           Chloride         14.0         3.00         mg/L           Fluoride         4.15         0.500         mg/L           Sulfate         881         25.0         mg/L	Analyte         Result Oualifier         RL Oualifier         MDL Ounit MDL Ounit         D Ounit         <	Analyte         Result Oualifier         RL Oualifier         MDL Ounit MDL Unit MDL Ounit         D Ounit MDL Ounit <t< th=""><th>Analyte         Result Oualifier         RL Oualifier         MDL Out Out Out Out Out Out Out Out Out Out</th></t<>	Analyte         Result Oualifier         RL Oualifier         MDL Out

Job ID: 280-164440-1 SDG: AVS Landfill

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-581778/1-A

**Analysis Batch: 581905** 

**Matrix: Water** 

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

**Prep Batch: 581778** 

**Prep Batch: 581778** 

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100		ug/L		07/25/22 10:15	07/25/22 18:11	1
Calcium	ND		200		ug/L		07/25/22 10:15	07/25/22 18:11	1

Lab Sample ID: LCS 280-581778/2-A **Client Sample ID: Lab Control Sample Prep Type: Total Recoverable Matrix: Water** 

MB MB

Analysis Batch: 581905

-	Spike	LCS	LCS				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Boron	2000	1929		ug/L		96	86 - 110	
Calcium	50000	48990		ug/L		98	90 - 111	

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-581039/6 **Client Sample ID: Method Blank** 

**Matrix: Water** 

Analysis Batch: 581039

**Prep Type: Total/NA** 

MB MB Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Chloride 3.00 07/16/22 14:56 ND mg/L Fluoride 0.500 ND mg/L 07/16/22 14:56 Sulfate ND 5.00 mg/L 07/16/22 14:56

Lab Sample ID: LCS 280-581039/4 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 581039** 

		Spike	LCS	LCS				%Rec	
Analyte		Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	 	100	97.30		mg/L		97	90 - 110	
Fluoride		5.00	4.840		mg/L		97	90 - 110	
Sulfate		100	104.9		mg/L		105	90 - 110	

Lab Sample ID: LCSD 280-581039/5 Client Sample ID: Lab Control Sample Dup Prep Type: Total/NA

**Matrix: Water** 

**Analysis Batch: 581039** 

_	Spike	LCSD	LCSD				%Rec		RPD	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
Chloride	100	97.43		mg/L		97	90 - 110	0	10	
Fluoride	5.00	4.865		mg/L		97	90 - 110	0	10	
Sulfate	100	105.0		mg/L		105	90 - 110	0	10	

Lab Sample ID: MRL 280-581039/3 **Client Sample ID: Lab Control Sample Matrix: Water** Prep Type: Total/NA

Analysis Batch: 581039

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-	Spike	MRL	MRL				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Chloride	5.00	3.221		mg/L		64	50 - 150	
Fluoride	0.500	0.5809		mg/L		116	50 - 150	
Sulfate	5.00	ND		mg/L		71	50 - 150	

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7/27/2022

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

**Prep Type: Total/NA** 

Prep Type: Total/NA

Prep Type: Total/NA

Prep Type: Total/NA

**Prep Type: Total/NA** 

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Lab Control Sample Dup

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Method Blank

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Method Blank

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

Lab Sample ID: MB 280-581081/44

**Matrix: Water** 

Analysis Batch: 581081

MB MB

Result Qualifier RL **MDL** Unit Analyzed Dil Fac Analyte D Prepared Sulfate 5.00 07/19/22 00:57 ND mg/L

Lab Sample ID: LCS 280-581081/40

**Matrix: Water** 

**Analysis Batch: 581081** 

Spike LCS LCS %Rec Added Result Qualifier D %Rec Limits Analyte Unit 100 102.3 90 - 110 Sulfate mg/L 102

Lab Sample ID: LCSD 280-581081/43

**Matrix: Water** 

**Analysis Batch: 581081** 

Spike LCSD LCSD %Rec **RPD** Added Result Qualifier Limits **RPD** Analyte Unit %Rec Limit Sulfate 100 102.0 102 90 - 110 mg/L

Lab Sample ID: MRL 280-581081/3

**Matrix: Water** 

**Analysis Batch: 581081** 

Spike MRL MRL %Rec Analyte Added Result Qualifier Unit %Rec Limits 5.00 ND Sulfate mg/L 73 50 - 150

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

Lab Sample ID: MB 280-581227/1

**Matrix: Water** 

**Analysis Batch: 581227** 

MB MB

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Total Dissolved Solids (TDS) ND 10.0 mg/L 07/19/22 10:31

Lab Sample ID: LCS 280-581227/2

**Matrix: Water** 

Analysis Batch: 581227

LCS LCS Spike %Rec Added Result Qualifier Analyte Unit %Rec Limits Total Dissolved Solids (TDS) 502 480.0 96 88 - 114 mg/L

Lab Sample ID: MB 280-581229/1

**Matrix: Water** 

**Analysis Batch: 581229** 

MR MR

Result Qualifier RL MDL Unit D Prepared Analyzed Dil Fac Total Dissolved Solids (TDS) 10.0 07/19/22 10:32 ND mg/L

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## **QC Sample Results**

Client: Basin Electric Power Cooperative

Lab Sample ID: LCS 280-581229/2

Lab Sample ID: LCSD 280-581229/3

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

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

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

Job ID: 280-164440-1

SDG: AVS Landfill

**Matrix: Water** Analysis Batch: 581229

LCS LCS %Rec Spike Analyte Added Result Qualifier Unit D %Rec Limits

Total Dissolved Solids (TDS) 502 481.0 mg/L 96 88 - 114

**Client Sample ID: Lab Control Sample Dup** 

Prep Type: Total/NA

Analysis Batch: 581229

**Matrix: Water** 

LCSD LCSD RPD Spike %Rec **Analyte** Added Result Qualifier Unit D %Rec Limits RPD Limit Total Dissolved Solids (TDS) 502 483.0 96 88 - 114 0 mg/L

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

## **Metals**

## **Prep Batch: 581778**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164440-1	MW-15S	Total Recoverable	Water	3005A	
280-164440-2	MW-16S	Total Recoverable	Water	3005A	
280-164440-3	MW-17S	Total Recoverable	Water	3005A	
280-164440-4	MW-18S	Total Recoverable	Water	3005A	
280-164440-5	MW-19S	Total Recoverable	Water	3005A	
280-164440-6	MW-20S	Total Recoverable	Water	3005A	
280-164440-7	DUP	Total Recoverable	Water	3005A	
MB 280-581778/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-581778/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

### **Analysis Batch: 581905**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164440-1	MW-15S	Total Recoverable	Water	6010C	581778
280-164440-2	MW-16S	Total Recoverable	Water	6010C	581778
280-164440-3	MW-17S	Total Recoverable	Water	6010C	581778
280-164440-4	MW-18S	Total Recoverable	Water	6010C	581778
280-164440-5	MW-19S	Total Recoverable	Water	6010C	581778
280-164440-6	MW-20S	Total Recoverable	Water	6010C	581778
280-164440-7	DUP	Total Recoverable	Water	6010C	581778
MB 280-581778/1-A	Method Blank	Total Recoverable	Water	6010C	581778
LCS 280-581778/2-A	Lab Control Sample	Total Recoverable	Water	6010C	581778

## **Analysis Batch: 581983**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164440-1	MW-15S	Total Recoverable	Water	6010C	581778
280-164440-2	MW-16S	Total Recoverable	Water	6010C	581778
280-164440-3	MW-17S	Total Recoverable	Water	6010C	581778
280-164440-4	MW-18S	Total Recoverable	Water	6010C	581778
280-164440-5	MW-19S	Total Recoverable	Water	6010C	581778
280-164440-6	MW-20S	Total Recoverable	Water	6010C	581778
280-164440-7	DUP	Total Recoverable	Water	6010C	581778

## **General Chemistry**

#### Analysis Batch: 581039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164440-1	MW-15S	Total/NA	Water	9056A	
280-164440-1	MW-15S	Total/NA	Water	9056A	
280-164440-2	MW-16S	Total/NA	Water	9056A	
280-164440-3	MW-17S	Total/NA	Water	9056A	
280-164440-4	MW-18S	Total/NA	Water	9056A	
280-164440-4	MW-18S	Total/NA	Water	9056A	
280-164440-5	MW-19S	Total/NA	Water	9056A	
280-164440-5	MW-19S	Total/NA	Water	9056A	
280-164440-6	MW-20S	Total/NA	Water	9056A	
280-164440-7	DUP	Total/NA	Water	9056A	
280-164440-7	DUP	Total/NA	Water	9056A	
MB 280-581039/6	Method Blank	Total/NA	Water	9056A	
LCS 280-581039/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-581039/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-581039/3	Lab Control Sample	Total/NA	Water	9056A	

Page 15 of 21

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

#### Job ID: 280-164440-1 SDG: AVS Landfill

## 3

## **General Chemistry**

## Analysis Batch: 581081

Lab Sample ID 280-164440-3	Client Sample ID MW-17S	Prep Type Total/NA	Matrix Water	Method 9056A	Prep Batch
MB 280-581081/44	Method Blank	Total/NA	Water	9056A	
LCS 280-581081/40	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-581081/43	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-581081/3	Lab Control Sample	Total/NA	Water	9056A	

#### **Analysis Batch: 581227**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164440-2	MW-16S	Total/NA	Water	SM 2540C	
280-164440-3	MW-17S	Total/NA	Water	SM 2540C	
MB 280-581227/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-581227/2	Lab Control Sample	Total/NA	Water	SM 2540C	

#### **Analysis Batch: 581229**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batcl
280-164440-1	MW-15S	Total/NA	Water	SM 2540C	_
280-164440-4	MW-18S	Total/NA	Water	SM 2540C	
280-164440-5	MW-19S	Total/NA	Water	SM 2540C	
280-164440-6	MW-20S	Total/NA	Water	SM 2540C	
280-164440-7	DUP	Total/NA	Water	SM 2540C	
MB 280-581229/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-581229/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-581229/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

**Client Sample ID: MW-15S** 

Date Collected: 07/13/22 08:40 Date Received: 07/15/22 09:50

Lab Sample ID: 280-164440-1

**Matrix: Water** 

Job ID: 280-164440-1

SDG: AVS Landfill

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 19:52	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:31	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 18:24	MEC	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	581039	07/16/22 18:39	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581229	07/19/22 10:32	ASP	TAL DEN

**Client Sample ID: MW-16S** Date Collected: 07/13/22 12:00

Date Received: 07/15/22 09:50

Lab Sample ID: 280-164440-2 **Matrix: Water** 

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 19:56	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:35	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 18:55	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581227	07/19/22 10:31	ASP	TAL DEN

**Client Sample ID: MW-17S** Lab Sample ID: 280-164440-3 Date Collected: 07/13/22 12:25 **Matrix: Water** 

Date Received: 07/15/22 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 20:00	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:39	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 19:43	MEC	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	581081	07/19/22 04:07	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581227	07/19/22 10:31	ASP	TAL DEN

**Client Sample ID: MW-18S** Lab Sample ID: 280-164440-4 **Matrix: Water** 

Date Collected: 07/13/22 10:45 Date Received: 07/15/22 09:50

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 20:04	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:43	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 19:59	MEC	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	581039	07/16/22 20:14	MEC	TAL DEN

Page 17 of 21

**Eurofins Denver** 

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

**Client Sample ID: MW-18S** Lab Sample ID: 280-164440-4 Date Collected: 07/13/22 10:45 **Matrix: Water** 

Date Received: 07/15/22 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581229	07/19/22 10:32	ASP	TAL DEN

Client Sample ID: MW-19S Lab Sample ID: 280-164440-5 Date Collected: 07/13/22 11:40 **Matrix: Water** 

Date Received: 07/15/22 09:50

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 20:08	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:47	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 20:30	MEC	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	581039	07/16/22 20:46	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581229	07/19/22 10:32	ASP	TAL DEN

Lab Sample ID: 280-164440-6 Client Sample ID: MW-20S Date Collected: 07/13/22 13:25 **Matrix: Water** 

Date Received: 07/15/22 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 20:12	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:51	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 21:02	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581229	07/19/22 10:32	ASP	TAL DEN

**Client Sample ID: DUP** Lab Sample ID: 280-164440-7 Date Collected: 07/13/22 11:40 **Matrix: Water** 

Date Received: 07/15/22 09:50

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581905	07/25/22 20:16	LMT	TAL DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	581778	07/25/22 10:15	KMS	TAL DEN
Total Recoverable	Analysis	6010C		1			581983	07/26/22 10:55	LMT	TAL DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581039	07/16/22 21:18	MEC	TAL DEN
Total/NA	Analysis	9056A		5	5 mL	5 mL	581039	07/16/22 21:34	MEC	TAL DEN
Total/NA	Analysis	SM 2540C		1	1 mL	100 mL	581229	07/19/22 10:32	ASP	TAL DEN

**Laboratory References:** 

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

**Eurofins Denver** 

Job ID: 280-164440-1

SDG: AVS Landfill

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - ND Sites - AVS Landfill

Job ID: 280-164440-1 SDG: AVS Landfill

## **Laboratory: Eurofins Denver**

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

Authority	Program	Identification Number	<b>Expiration Date</b>
North Dakota	State	R-034	01-08-23

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Project Name: CCR Groundwater - North Dakota Sites	Project #: 28021258				name of the last			Fluorio		ıry (3 o				tainon	-		W - pH 4-5 Z - other (specify)
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Sample Identification	Sample Date	Sample Time	Sample (w=water, Type S=solid, (C=comp, O=wastufoil, G=grab) BT=Tissue, A=Air)	Matrix (w=water, S=solid, O=waste/oil, 3T=Tissue, A=Air)	Field Filtered Perform MS/I	6010C - Total C		9056A_28D - C	2540C_Calcd -	6010C - Total L 3), 7470A - Tota 9315_Ra226, 93 Radium-228				Total Number	TOWN HUMBER	Special Inst	Special Instructions/Note:
	$\bigvee$	$\setminus$	Preservation Code:	ion Code:	$\Diamond$	0	z	z	-		See and the second	200000000000000000000000000000000000000	1		$\gamma$		
MW-188	7-13-22	0840	6	٤	N			<u>×</u>	×						7	DE'8 - HO	な
3 W - 165	7-13-22	1200	c	بح	ζ.	×	$\hat{\times}$		X					4	<del></del>	4.8 - HC	h. 8
3E-174	7-13-20 1226	1226	<u> </u>	-	2	7	<u>ス</u> メ	<u>~</u>	<u> </u>						- 1	7,92	ند

Relinquished by: Empty Kit Relinquished by: Relinquished by: Relinquished by: Custody Seals Intact:

∆ Yes ∆ No Custody Seal No.: Date/Time: Date/Time: Date/Time: フーノム・みな Date: 0730 Company Company Time: Cooler Temperature(s) °C and Other Remarks: Received by: 0.8 180 Ctto Company Ver: 01/16/2019

Possible Hazard Identification

Non-Hazard ☐ Flammable ☐ Skin Irriti

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

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 Mont

Special Instructions/QC Requirements:

Months

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## **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-164440-1

SDG Number: AVS Landfill

Login Number: 164440 List Source: Eurofins Denver

List Number: 1

Creator: Turner, Shelby R

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-164684-1

Laboratory Sample Delivery Group: AVS NEW WELLS
Client Project/Site: CCR Groundwater - NDS - AVS NEW
WELLS

#### For:

eurofins 🙀

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Shelby Turner

Authorized for release by: 8/23/2022 3:08:05 PM

Shelby Turner, Project Manager I (303)736-0100

Shelby.Turner@et.eurofinsus.com

.....LINKS .....



**Have a Question?** 



Visit us at: www.eurofinsus.com/Env The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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

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

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	7
Sample Summary	8
Client Sample Results	9
QC Sample Results	12
QC Association	14
Chronicle	15
Certification Summary	16
Chain of Custody	17
Receipt Checklists	20
Tracer Carrier Summary	22

12

## **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

Qualifiers

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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.
n	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid

DER Duplicate Error Ratio (normalized absolute difference)

Dil Fac Dilution Factor

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

EDL Estimated Detection Limit (Dioxin)

LOD Limit of Detection (DoD/DOE)

LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level"

MDA Minimum Detectable Activity (Radiochemistry)

MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit
ML Minimum Level (Dioxin)
MPN Most Probable Number
MQL Method Quantitation Limit

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

PQL Practical Quantitation Limit

PRES Presumptive QC Quality Control

RER Relative Error Ratio (Radiochemistry)

RL Reporting Limit or Requested Limit (Radiochemistry)

RPD Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin)
TEQ Toxicity Equivalent Quotient (Dioxin)

TNTC Too Numerous To Count

**Eurofins Denver** 

Page 3 of 22

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#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1

**Laboratory: Eurofins Denver** 

Narrative

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

Project: CCR Groundwater - NDS - AVS NEW WELLS

Report Number: 280-164684-1

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.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

#### **RECEIPT**

The samples were received on 7/21/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

#### RADIUM-226 (GFPC)

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for Radium-226 (GFPC) in accordance with SW 846 9315. The samples were prepared on 08/01/2022 and analyzed on 08/19/2022.

The following samples were prepared at a reduced aliquot due to Matrix: MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4). It can be noted that insufficient sample volume was available to perform a sample duplicate. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

#### RADIUM-228

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for Radium-228 in accordance with 9320. The samples were prepared on 08/01/2022 and analyzed on 08/11/2022.

The detection goal was not met for the following samples: MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4). The samples were prepped at a reduced volume due to the presence of matrix interferences. Analytical results are reported with the detection limit achieved.

The following samples were prepared at a reduced aliquot due to Matrix: MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4). It can be noted that insufficient sample volume was available to perform a sample duplicate. A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Job ID: 280-164684-1

SDG: AVS NEW WELLS

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#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

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## Job ID: 280-164684-1 (Continued)

## **Laboratory: Eurofins Denver (Continued)**

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-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for Radium-226/Radium-228 (GFPC) in accordance with 9315/9320. The samples were analyzed on 08/23/2022.

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: Basin Electric Power Cooperative	Job ID: 280-164684-1
Project/Site: CCR Groundwater - NDS - AVS NEW WELLS	SDG: AVS NEW WELLS
Client Sample ID: MW-24S	Lab Sample ID: 280-164684-1
No Detections.	
Client Sample ID: MW-21S	Lab Sample ID: 280-164684-2
No Detections.	
Client Sample ID: MW-22S	Lab Sample ID: 280-164684-3
No Detections.	
Client Sample ID: DUP	Lab Sample ID: 280-164684-4

This Detection Summary does not include radiochemical test results.

No Detections.

**Eurofins Denver** 

Page 6 of 22 8/23/2022

## **Method Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

Method	Method Description	Protocol	Laboratory
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Ra226_Ra228	Combined Radium-226 and Radium-228	TAL-STL	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

#### **Protocol References:**

None = None

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

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

#### Laboratory References:

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

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# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-164684-1	MW-24S	Water	07/19/22 09:20	07/21/22 09:30
280-164684-2	MW-21S	Water	07/19/22 10:50	07/21/22 09:30
280-164684-3	MW-22S	Water	07/19/22 12:45	07/21/22 09:30
280-164684-4	DUP	Water	07/19/22 12:45	07/21/22 09:30

Job ID: 280-164684-1 Project/Site: CCR Groundwater - NDS - AVS NEW WELLS SDG: AVS NEW WELLS

Method: 9315 - Radium-226 (GFPC)

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1

Date Collected: 07/19/22 09:20 **Matrix: Water** 

Date Received: 07/21/22 09:30

			Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.287	U	0.251	0.252	1.00	0.372	pCi/L	08/01/22 08:32	08/19/22 13:36	1
Carrier Ba Carrier	<b>%Yield</b> 99.0	Qualifier	Limits 40 - 110					<b>Prepared</b> 08/01/22 08:32	Analyzed 08/19/22 13:36	Dil Fac

**Client Sample ID: MW-21S** Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0470	U	0.274	0.274	1.00	0.570	pCi/L	08/01/22 08:32	08/19/22 13:36	1
Carrier Ba Carrier	% <b>Yield</b> 81.8	Qualifier	Limits 40 - 110					<b>Prepared</b> 08/01/22 08:32	Analyzed 08/19/22 13:36	Dil Fac

Client Sample ID: MW-22S Lab Sample ID: 280-164684-3

Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

Date Received.	01721722 0010		Count Uncert.	Total Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.133	U	0.234	0.234	1.00	0.417	pCi/L	08/01/22 08:32	08/19/22 13:37	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	101		40 - 110					08/01/22 08:32	08/19/22 13:37	1

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4 **Matrix: Water** 

Date Collected: 07/19/22 12:45

Date Received: 0	7/21/22 09:3	0	Count Uncert.	Total Uncert.						
Analyte Radium-226	-0.202	Qualifier U	(2σ+/-) 0.143	(2σ+/-) 0.145	RL 1.00	MDC 0.431	Unit pCi/L	Prepared 08/01/22 08:32	Analyzed 08/19/22 13:47	Dil Fac
Carrier Ba Carrier	% <b>Yield</b> 101	Qualifier	Limits 40 - 110					<b>Prepared</b> 08/01/22 08:32	Analyzed 08/19/22 13:47	Dil Fac

Method: 9320 - Radium-228 (GFPC)

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1 **Matrix: Water** 

Date Collected: 07/19/22 09:20

Date Received: 07/	21/22 09:3	30								
			Count	Total						
Analyte	Result	Qualifier	Uncert. (2σ+/-)	Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.767		1.13	1.13	1.00		pCi/L		08/11/22 11:24	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	99.0		40 - 110					08/01/22 08:40	08/11/22 11:24	1

**Eurofins Denver** 

Page 9 of 22 8/23/2022

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1

SDG: AVS NEW WELLS

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

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1

Date Collected: 07/19/22 09:20 **Matrix: Water** 

Date Received: 07/21/22 09:30

**%Yield Qualifier** Limits Prepared Analyzed Dil Fac Y Carrier 81.9 40 - 110 08/01/22 08:40 08/11/22 11:24

Lab Sample ID: 280-164684-2 Client Sample ID: MW-21S

Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Ba Carrier	81.8		40 - 110					08/01/22 08:40	08/11/22 11:24	1
Y Carrier	89.0		40 - 110					08/01/22 08:40	08/11/22 11:24	1

Lab Sample ID: 280-164684-3 Client Sample ID: MW-22S Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

Count Total Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$ RL**MDC** Unit Prepared Analyzed  $(2\sigma + / -)$ Dil Fac Radium-228 1.23 U G 1.08 1.08 1.00 1.69 pCi/L 08/01/22 08:40 08/11/22 11:24

Carrier %Yield Qualifier Prepared Limits Analyzed Dil Fac Ba Carrier 101 40 - 110 08/01/22 08:40 08/11/22 11:24 08/01/22 08:40 08/11/22 11:24 Y Carrier 91.6 40 - 110

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4 **Matrix: Water** 

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

Count Total Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Analyzed Dil Fac Radium-228 1.51 U G 1.27 1.27 1.00 1.99 pCi/L 08/01/22 08:40 08/11/22 11:24

Carrier **%Yield Qualifier** Limits Prepared Analyzed Dil Fac Ba Carrier 101 40 - 110 08/01/22 08:40 08/11/22 11:24 Y Carrier 88.6 40 - 110 08/01/22 08:40 08/11/22 11:24

Method: Ra226 Ra228 - Combined Radium-226 and Radium-228

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1 Date Collected: 07/19/22 09:20 **Matrix: Water** 

Date Received: 07/21/22 09:30

Count Total Uncert. Uncert. Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ **MDC** Unit Prepared Analyzed Analyte RL Dil Fac Combined Radium 226 1.05 U 08/23/22 11:21 1.16 1.16 5.00 1.90 pCi/L

+ 228

**Eurofins Denver** 

# **Client Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

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

Client Sample ID: MW-21S Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50

**Matrix: Water** 

Date Received: 07/21/22 09:30

			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226	1 26	U	1 40	1 40	5.00	2 21	nCi/l		08/23/22 11:21	1

+ 228

Client Sample ID: MW-22S Lab Sample ID: 280-164684-3

**Matrix: Water** 

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

Date Neceived. 0772	1/22 09.0	<b>,</b>								
			Count	Total						
			Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.37	U	1.11	1.11	5.00	1.69	pCi/L		08/23/22 11:21	1

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4

**Matrix: Water** 

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

Count Total Uncert. Uncert. Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ Dil Fac Analyte RL **MDC** Unit Prepared Analyzed 1.31 U 1.28 1.99 pCi/L 08/23/22 11:21 Combined Radium 226 1.28 5.00

+ 228

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

# Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-575921/1-A

**Matrix: Water** 

Analysis Batch: 578688

Client Sample ID: Method Blank

Prep Type: Total/NA

**Prep Batch: 575921** 

	MB	MB	Uncert.	Uncert.						
Analyte	Result	Qualifier	(2σ+/-)	(2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0008323	U	0.0462	0.0462	1.00	0.101	pCi/L	08/01/22 08:32	08/19/22 08:13	1

Total

Count

MB MB

Carrier **%Yield Qualifier** Limits Prepared Analyzed Dil Fac Ba Carrier 104 40 - 110 08/01/22 08:32 08/19/22 08:13

**Client Sample ID: Lab Control Sample** 

Prep Type: Total/NA

**Prep Batch: 575921** 

Lab Sample ID: LCS 160-575921/2-A **Matrix: Water** 

Analysis Batch: 578736

Total LCS LCS %Rec **Spike** Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL **MDC** Unit %Rec Limits Radium-226 11.3 9.876 1.03 1.00 0.105 pCi/L 87 75 - 125

LCS LCS

Carrier %Yield Qualifier Limits Ba Carrier 103 40 - 110

**Client Sample ID: Lab Control Sample Dup** 

Prep Type: Total/NA

**Prep Batch: 575921** 

**Prep Batch: 575922** 

Lab Sample ID: LCSD 160-575921/3-A

**Matrix: Water** 

**Analysis Batch: 578736** 

Total LCSD LCSD Uncert. %Rec **RER** Spike %Rec Analyte Added  $(2\sigma + / -)$ RL **MDC** Unit Limits Result Qual RER Limit Radium-226 11.3 1.01 1.00 0.105 pCi/L 85 75 - 125 0.13 9.619

LCSD LCSD

Carrier %Yield Qualifier Limits Ba Carrier 101 40 - 110

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

Lab Sample ID: MB 160-575922/1-A **Client Sample ID: Method Blank Matrix: Water** Prep Type: Total/NA

**Analysis Batch: 577587** 

Count Total MB MB Uncert. Uncert. Analyte Result Qualifier  $(2\sigma + / -)$  $(2\sigma + / -)$ RL **MDC** Unit Prepared Dil Fac Analyzed Radium-228 0.05175 Ū 0.251 0.251 1.00 0.455 pCi/L 08/01/22 08:40 08/11/22 11:09

> MB MB

Carrier %Yield Qualifier Limits Prepared Dil Fac Analyzed Ba Carrier 104 40 - 110 08/01/22 08:40 08/11/22 11:09 40 - 110 Y Carrier 85.2 08/01/22 08:40 08/11/22 11:09

# **QC Sample Results**

Client: Basin Electric Power Cooperative

**Analysis Batch: 577587** 

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

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

Lab Sample ID: LCS 160-575922/2-A

Client Sample ID: Lab Control Sample
Matrix: Water

Prep Type: Total/NA

Prep Type: Total/NA
Prep Batch: 575922

Total LCS LCS %Rec Spike Uncert. Analyte Added Result Qual  $(2\sigma + / -)$ RL**MDC** Unit %Rec Limits Radium-228 8.37 8.277 1.13 1.00 0.492 pCi/L 75 - 125

 Carrier
 %Yield Plant
 Qualifier Plant
 Limits Plant

 Ba Carrier
 103
 40 - 110

 Y Carrier
 87.5
 40 - 110

Lab Sample ID: LCSD 160-575922/3-A Client Sample ID: Lab Control Sample Dup

Matrix: Water Prep Type: Total/NA
Analysis Batch: 577587 Prep Batch: 575922

Total **Spike** LCSD LCSD Uncert. %Rec **RER** %Rec Limits Analyte Added  $(2\sigma + / -)$ RL **MDC** Unit Limit Result Qual RER Radium-228 1.00 0.446 pCi/L 8.37 7.979 1.09 95 75 - 125 0.13

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

 Y Carrier
 86.4
 40 - 110

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# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

# **Prep Batch: 575921**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	PrecSep-21	
280-164684-2	MW-21S	Total/NA	Water	PrecSep-21	
280-164684-3	MW-22S	Total/NA	Water	PrecSep-21	
280-164684-4	DUP	Total/NA	Water	PrecSep-21	
MB 160-575921/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-575921/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
LCSD 160-575921/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep-21	

# **Prep Batch: 575922**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	PrecSep_0	
280-164684-2	MW-21S	Total/NA	Water	PrecSep_0	
280-164684-3	MW-22S	Total/NA	Water	PrecSep_0	
280-164684-4	DUP	Total/NA	Water	PrecSep_0	
MB 160-575922/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-575922/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
LCSD 160-575922/3-A	Lab Control Sample Dup	Total/NA	Water	PrecSep 0	

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Lab Sample ID: 280-164684-1

**Matrix: Water** 

Job ID: 280-164684-1

SDG: AVS NEW WELLS

Client Sample ID: MW-24S Date Collected: 07/19/22 09:20 Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			256.13 mL	1.0 g	575921	08/01/22 08:32	MS	EET SL
Total/NA	Analysis	9315		1			578688	08/19/22 13:36	FLC	EET SL
Total/NA	Prep	PrecSep_0			256.13 mL	1.0 g	575922	08/01/22 08:40	MS	EET SL
Total/NA	Analysis	9320		1			577571	08/11/22 11:24	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			579070	08/23/22 11:21	EMH	EET SL

Lab Sample ID: 280-164684-2 Client Sample ID: MW-21S

Date Collected: 07/19/22 10:50 **Matrix: Water** Date Received: 07/21/22 09:30

Prep Type Total/NA Total/NA	Batch Type Prep Analysis	Batch Method PrecSep-21 9315	Run	Dil Factor	Amount 246.19 mL	Final Amount 1.0 g	Batch Number 575921 578688	Prepared or Analyzed 08/01/22 08:32 08/19/22 13:36		Lab EET SL EET SL
Total/NA Total/NA	Prep Analysis	PrecSep_0 9320		1	246.19 mL	1.0 g	575922 577571	08/01/22 08:40 08/11/22 11:24		EET SL EET SL
Total/NA	Analysis	Ra226_Ra228		1			579070	08/23/22 11:21	EMH	EET SL

Lab Sample ID: 280-164684-3 Client Sample ID: MW-22S Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

=	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			246.85 mL	1.0 g	575921	08/01/22 08:32	MS	EET SL
Total/NA	Analysis	9315		1			578688	08/19/22 13:37	FLC	EET SL
Total/NA	Prep	PrecSep_0			246.85 mL	1.0 g	575922	08/01/22 08:40	MS	EET SL
Total/NA	Analysis	9320		1			577571	08/11/22 11:24	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			579070	08/23/22 11:21	EMH	EET SL

Lab Sample ID: 280-164684-4 **Client Sample ID: DUP** 

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			246.74 mL	1.0 g	575921	08/01/22 08:32	MS	EET SI
Total/NA	Analysis	9315		1			578736	08/19/22 13:47	FLC	EET SI
Total/NA	Prep	PrecSep_0			246.74 mL	1.0 g	575922	08/01/22 08:40	MS	EET SI
Total/NA	Analysis	9320		1			577571	08/11/22 11:24	FLC	EET SI
Total/NA	Analysis	Ra226 Ra228		1			579070	08/23/22 11:21	EMH	EET SI

**Laboratory References:** 

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

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

# **Laboratory: Eurofins St. Louis**

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

Authority	Program	Identification Number	<b>Expiration Date</b>
Alaska (UST)	State	20-001	05-06-25
ANAB	Dept. of Defense ELAP	L2305	04-06-25
ANAB	Dept. of Energy	L2305.01	04-06-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-22
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	07-01-22 *
Connecticut	State	PH-0241	03-31-23
Florida	NELAP	E87689	06-30-23
HI - RadChem Recognition	State	n/a	06-30-23
Illinois	NELAP	200023	11-30-22
lowa	State	373	12-01-22
Kansas	NELAP	E-10236	10-31-22
Kentucky (DW)	State	KY90125	12-31-22
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-22
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-23
Louisiana (DW)	State	LA011	12-31-22
Maryland	State	310	09-30-23
MI - RadChem Recognition	State	9005	06-30-23
Missouri	State	780	06-30-25
Nevada	State	MO000542020-1	07-31-23
New Jersey	NELAP	MO002	06-30-23
New York	NELAP	11616	04-01-23
North Dakota	State	R-207	06-30-23
NRC	NRC	24-24817-01	12-31-22
Oklahoma	NELAP	9997	08-31-22
Oregon	NELAP	4157	09-01-22
Pennsylvania	NELAP	68-00540	02-28-23
South Carolina	State	85002001	06-30-22 *
Texas	NELAP	T104704193	07-31-23
US Fish & Wildlife	US Federal Programs	058448	07-31-23
USDA	US Federal Programs	P330-17-00028	03-11-23
Utah	NELAP	MO000542021-14	08-01-22 *
Virginia	NELAP	10310	06-14-23
Washington	State	C592	08-30-22
West Virginia DEP	State	381	10-31-22

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 $<sup>^{\</sup>star} \ \text{Accreditation/Certification renewal pending - accreditation/certification considered valid}.$ 

**Eurofins Denver** 

4955 Yarrow Street Агувда, СО 80002 Phone (303) 736-0100 Fax (303) 431-7171	·	ıain of	Cust	Chain of Custody Record	ecord					en •	eurotins	Environment Testing America
Client Information	Sampler Kintson	ક		Lab Pr	A. er, Shelby	   œ	Lab PM. Turner, Shelby R	Carrier Trac	Carrier Tracking No(s).	COC No		
Client Contact Mr. Aaron Knutson	Phone: 701-745	5-72	.38	E-Mail Shelt	y.Turner(	DET. Eurof	īnsUS.com			Page:	401	_
Company Basin Electric Power Cooperative							Analysis	Analysis Requested		Job #:		
Address 3901 Highway 200A	Due Date Requested:						OL			Preserv		:6
City: Stanton	TAT Requested (days)						S) slst bns			A - HCL B - NaOl		M - Hexane N - None
State, Zip: ND, 58571	Stendard	て					(V) ;			D - Nitrio		0 - ASNBO2 P - Na204S Q - Na2SO3
Phone: 701-745-7238(Tel)	₩.						IstoT - xibneqe			F - MeO	F - MeOH G - Amchlor H - Arcochic Acid	R - Na2S2O3 S - H2SO4 T - TSB Dodoobudgets
Email aknutson@bepc.com	WO#				(0)		A0S08 1A) (5 i					U - Acetone V - MCAA
Project Name CCR Groundwater - North Dakota Sites	Project # 28021258				COL		of 3), ry (3 of			Service Control		W - pH 4-5 Z - other (specify)
PVS NEW WELLS	**MOSS				A) as	l , <del>s</del> binol	i) muld iuoneM issa_0			other:		
		<b></b>	Sample Type	Matrix (Www.ater. Sweeted,	2 benefiti t anga mac so nator - O	T - bəls⊃_O	C - Total Lit 170A - Total 2505, 932 250, 932			) Tedmibh i		
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								280-1646	280-164684 Chain of Custody	of Custody		
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Possible Hazard Identification  Non-Hazard Plammable Skin Imtant Pois	Poison B 🔀 Unknown		Radiological		Sampl	le Disposal ( A t Return To Client	al (A fee ma) Client	be assessed if sam Disposal By Lab	lf samples a ly Lab	Semple Disposal ( A fee may be assessed if samples are retained longer than 1 month)  Return To Client Disposal By Lab Archive For Mon	er than 1 n	nonth) Months
Deliverable Requested: I, II, III, IV, Other (specify)					Specia	l Instructio	Special Instructions/QC Requirements					
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Custody Seals Infact: Custody Seal No.:					Š	oler Tempera	ture(s) °C and Ot	Cooler Temperature(s) $^{\circ}$ C and Other Remarks: $\mathcal{O}_{\star}\mathcal{E}_{}$	12 d	1/2 CF40.	7.0	
												Ver: 01/16/2019

ORIGIN ID:BISA (701) 745-3371 LELAND OLDS STATION BASIN ELECTRIC 3901 HWY 200A

SHIP DATE: 20JUL22 ACTWGT: 61.00 LB CAD: 251286197/INET4490

STANTON, ND 58571 UNITED STATES US

**BILL SENDER** 

TO SHELBY TURNER EUROFINS TESTAMERICA, DENVER 4955 YARROW ST

--581J20A92/FE4A

ARVADA CO 80002

REF: CCR GROUNDWATER - ND SITE



TRK# 7774 3383 0074

THU - 21 JUL 10:30A PRIORITY OVERNIGHT

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eurofins

Custody Seal

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**Environment Testing** 

# Chain of Custody Record

Phone: 303-736-0100 Fax: 303-431-7171

Arvada, CO 80002 4955 Yarrow Street

**Eurofins Denver** 

S - H2SO4 T - TSP Dodecahydrate Note Since laboratory accreditations are subject to change, Eurofins TestAmerica 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 Organ issted above for analysis/flests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica. Special Instructions/Note: Company Constant Z - other (specify) N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 U - Acetone V - MCAA W - pH 4-5 Y - Trizma Months Company Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For Mon Preservation Codes A - HCL
B - NaOH
C - Zn Acetate
D = Nitric Acid
F - MaSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid 2022 0800 COC No. 280-622902.1 280-164684-1 Page: Page 1 of 1 I - Ice J - Di Water K - EDTA L - EDA Total Number of containers 2 0 2 Time: Date/Time Method of Shipment Carrier Tracking No(s) State of Origin: North Dakota Received by A Octhoropto **Analysis Requested** Cooler Temperature(s) °C and Other Remarks: FED EX Special Instructions/QC Requirements: Shelby. Turner@et.eurofinsus.com Accreditations Required (See note): State - North Dakota 822-muibe? × × × × Ra226Ra228\_GFPC/ Combined Radium-226 and Recentlyed by: Received by: × × × 320\_Ra228/PrecSep\_0 Radium-228 × Lab PM. Turner, Shelby R × × × × Ra226/PrecSep\_21 Radium-226 (oh to self) (Yes or No) Ime: Company Company Field Filtrated Sample (Yes or No.) E-Mail: BT=Tlasue, A=Air Preservation Code: Water Water Water Water Matrix Company (C=comp, Sample G=grab) Type D Primary Deliverable Rank: 2 Central 10:50 Central 12:45 Central 12:45 Central Time 09:20 Date: Due Date Requested: 8/22/2022 TAT Requested (days): Sample Date Date/Time 7/19/22 7/19/22 7/19/22 7/19/22 Project # 28021258 SSOW#: Date/Time Date/Time Phone # OM Client Information (Sub Contract Lab) Unconfirmed Deliverable Requested: I, II, III, IV, Other (specify) FED EX CCR Groundwater - NDS - AVS NEW WELLS Custody Seal No. Sample Identification - Client ID (Lab ID) 314-298-8566(Tel) 314-298-8757(Fax) Possible Hazard Identification FestAmerica Laboratories, Inc Empty Kit Relinquished by MW-24S (280-164684-1) MW-21S (280-164684-2) MW-22S (280-164684-3) Custody Seals Intact:

Δ Yes Δ No 13715 Rider Trail North, DUP (280-164684-4) Shipping/Receiving nquished by: dinquished by: State, Zip: MO, 63045 linquished by Earth City

# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Samples do not require splitting or compositing.

Residual Chlorine Checked.

Job Number: 280-164684-1

SDG Number: AVS NEW WELLS

**List Source: Eurofins Denver** 

8/23/2022

Login Number: 164684

List Number: 1

Creator: Roehsner, Karen P

Answer	
Allowel	Comment
True	
N/A	
True	
N/A	
True	
	True True True True True True True True

True

N/A

# Login Sample Receipt Checklist

Client: Basin Electric Power Cooperative

Job Number: 280-164684-1

SDG Number: AVS NEW WELLS

Login Number: 164684

List Number: 2

Creator: Bohlmann, Jessica M

List Source: Eurofins St. Louis List Creation: 07/25/22 10:45 AM

8/23/2022

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

# **Tracer/Carrier Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-1 SDG: AVS NEW WELLS

Method: 9315 - Radium-226 (GFPC)

Matrix: Water Prep Type: Total/NA

			Percent Yield (Acceptance Limits)
		Ва	
Lab Sample ID	Client Sample ID	(40-110)	
280-164684-1	MW-24S	99.0	
280-164684-2	MW-21S	81.8	
280-164684-3	MW-22S	101	
280-164684-4	DUP	101	
LCS 160-575921/2-A	Lab Control Sample	103	
LCSD 160-575921/3-A	Lab Control Sample Dup	101	
MB 160-575921/1-A	Method Blank	104	
Tracer/Carrier Legend	i		
Ba = Ba Carrier			

Method: 9320 - Radium-228 (GFPC)

Matrix: Water Prep Type: Total/NA

				Percent Yield (Acceptance Limits)
		Ва	Y	
Lab Sample ID	Client Sample ID	(40-110)	(40-110)	
280-164684-1	MW-24S	99.0	81.9	
280-164684-2	MW-21S	81.8	89.0	
280-164684-3	MW-22S	101	91.6	
280-164684-4	DUP	101	88.6	
LCS 160-575922/2-A	Lab Control Sample	103	87.5	
LCSD 160-575922/3-A	Lab Control Sample Dup	101	86.4	
MB 160-575922/1-A	Method Blank	104	85.2	

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier



# **Environment Testing America**

# **ANALYTICAL REPORT**

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

Laboratory Job ID: 280-164684-2

Laboratory Sample Delivery Group: AVS NEW WELLS
Client Project/Site: CCR Groundwater - NDS - AVS NEW
WELLS

For:

Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, North Dakota 58504

Attn: Aaron Knutson

Authorized for release by: 8/5/2022 10:45:47 AM

Shelby Turner, Project Manager I (303)736-0100

Shelby.Turner@et.eurofinsus.com

Shelly Turner

Review your project results through

----- LINKS -----

Have a Question?

Ask
The

Visit us at:
www.eurofinsus.com/Env

The test results in this report meet all 2003 NELAC, 2009 TNI, and 2016 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.

2

А

5

6

8

9

4 4

12

13

# **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions	3
Case Narrative	4
Detection Summary	6
Method Summary	8
Sample Summary	9
Client Sample Results	10
QC Sample Results	13
QC Association	17
Chronicle	19
Certification Summary	21
Chain of Custody	22
Receipt Checklists	24

2

4

5

ð

10

12

13

# **Definitions/Glossary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

#### **Qualifiers**

Metals
--------

Qualifier **Qualifier Description** 

^6+ Interference Check Standard (ICSA and/or ICSAB) is outside acceptance limits, high biased.

#### **Glossary**

Abbreviation	These commonly used abbreviations may or may not be present in this report.
	<del></del>

¤ Listed under the "D" column to designate that the result is reported on a dry weight basis

%R Percent Recovery **CFL** Contains Free Liquid CFU Colony Forming Unit CNF Contains No Free Liquid

Duplicate Error Ratio (normalized absolute difference) **DER** 

Dil Fac **Dilution Factor** 

DL Detection Limit (DoD/DOE)

DL, RA, RE, IN Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

DLC Decision Level Concentration (Radiochemistry)

**EDL** Estimated Detection Limit (Dioxin) LOD Limit of Detection (DoD/DOE) LOQ Limit of Quantitation (DoD/DOE)

MCL EPA recommended "Maximum Contaminant Level" MDA Minimum Detectable Activity (Radiochemistry) MDC Minimum Detectable Concentration (Radiochemistry)

MDL Method Detection Limit MLMinimum Level (Dioxin) MPN Most Probable Number Method Quantitation Limit MQL

NC Not Calculated

ND Not Detected at the reporting limit (or MDL or EDL if shown)

NEG Negative / Absent POS Positive / Present

**PQL Practical Quantitation Limit** 

**PRES** Presumptive QC **Quality Control** 

Relative Error Ratio (Radiochemistry) **RER** 

Reporting Limit or Requested Limit (Radiochemistry) RL

**RPD** Relative Percent Difference, a measure of the relative difference between two points

TEF Toxicity Equivalent Factor (Dioxin) **TEQ** Toxicity Equivalent Quotient (Dioxin)

Too Numerous To Count **TNTC** 

Page 3 of 24

#### **Case Narrative**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2

**Laboratory: Eurofins Denver** 

Narrative

#### **CASE NARRATIVE**

**Client: Basin Electric Power Cooperative** 

**Project: CCR Groundwater - NDS - AVS NEW WELLS** 

Report Number: 280-164684-2

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

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

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

#### **RECEIPT**

The samples were received on 7/21/2022 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.7° C.

#### **TOTAL RECOVERABLE METALS**

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for Total Recoverable Metals in accordance with EPA SW-846 Method 6010C. The samples were prepared on 08/01/2022 and analyzed on 08/02/2022 and 08/03/2022.

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

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

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for total metals (ICPMS) in accordance with EPA SW-846 6020A. The samples were prepared on 07/25/2022 and analyzed on 07/26/2022.

The interference check standard solution (ICSA) associated with batch 280-581901 had results for one or more elements at a level greater than 2x the RL. The ICSA result (3.097 ppb) was >2x RL (1 ppb) for Barium. The vendor acknowledges that these elements are trace impurities in the ICSA standard. These results are not indicative of a matrix interference.

The continuing calibration verification (CCV) associated with batch 280-581979 recovered (118%) above the upper control limit (110%) for Beryllium. The MB and LCS associated with this CCV were within control for the affected analyte; therefore, the data has been reported. The associated samples are impacted: (CCV 280-581979/37), (LCS 280-581812/2-A) and (MB 280-581812/1-A).

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

#### **TOTAL MERCURY**

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared on 07/27/2022 and analyzed on 07/28/2022.

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

#### **TOTAL DISSOLVED SOLIDS**

SDG: AVS NEW WELLS

Job ID: 280-164684-2

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#### Case Narrative

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

2

# Job ID: 280-164684-2 (Continued)

#### **Laboratory: Eurofins Denver (Continued)**

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 07/22/2022.

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

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

Samples MW-24S (280-164684-1), MW-21S (280-164684-2), MW-22S (280-164684-3) and DUP (280-164684-4) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A (28 Days). The samples were analyzed on 07/24/2022 and 07/27/2022.

Samples MW-21S (280-164684-2)[10X], MW-22S (280-164684-3)[10X] and DUP (280-164684-4)[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.

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Client Sample ID: MW-24S

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Lab Sample ID: 280-164684-1

Lab Sample ID: 280-164684-2

Lab Sample ID: 280-164684-3

Lab Sample ID: 280-164684-4

<u> </u>								•	
– Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	123		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	4710		200		ug/L	1		6010C	Total
									Recoverable
Lithium	58.8		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	79.4	^6+	1.00		ug/L	1		6020A	Total/NA
Chromium	2.99		2.00		ug/L	1		6020A	Total/NA
Cobalt	1.45		1.00		ug/L	1		6020A	Total/NA
Molybdenum	9.16		2.00		ug/L	1		6020A	Total/NA
Chloride	49.4		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.90		0.500		mg/L	1		9056A	Total/NA
Sulfate	44.0		5.00		mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	1960		20.0		mg/L	1		SM 2540C	Total/NA

# Client Sample ID: MW-21S

Analyte	Result Qualifier	r RL	MDL Unit	Dil Fac	D Method	Prep Type
Boron	136	100	ug/L	1	6010C	Total
						Recoverable
Calcium	4710	200	ug/L	1	6010C	Total
						Recoverable
Lithium	49.9	20.0	ug/L	1	6010C	Total
						Recoverable
Barium	45.5 ^6+	1.00	ug/L	1	6020A	Total/NA
Chloride	16.1	3.00	mg/L	1	9056A	Total/NA
Fluoride	4.97	0.500	mg/L	1	9056A	Total/NA
Sulfate	624	50.0	mg/L	10	9056A	Total/NA
Total Dissolved Solids (TDS)	2170	20.0	mg/L	1	SM 2540C	Total/NA

# Client Sample ID: MW-22S

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	141		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	2590		200		ug/L	1		6010C	Total
									Recoverable
Lithium	49.9		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	59.8	^6+	1.00		ug/L	1		6020A	Total/NA
Chloride	9.32		3.00		mg/L	1		9056A	Total/NA
Fluoride	4.01		0.500		mg/L	1		9056A	Total/NA
Sulfate	253		50.0		mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1580		20.0		mg/L	1		SM 2540C	Total/NA

# **Client Sample ID: DUP**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	143		100		ug/L	1	_	6010C	Total
									Recoverable
Calcium	2500		200		ug/L	1		6010C	Total
									Recoverable
Lithium	46.6		20.0		ug/L	1		6010C	Total
									Recoverable
Barium	59.7	^6+	1.00		ug/L	1		6020A	Total/NA

This Detection Summary does not include radiochemical test results.

Page 6 of 24

# **Detection Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

# **Client Sample ID: DUP (Continued)**

# Lab Sample ID: 280-164684-4

Analyte	Result Qualifier	RL	MDL Unit	Dil Fac [	Method	Prep Type
Chloride	9.34	3.00	mg/L		9056A	Total/NA
Fluoride	4.04	0.500	mg/L	1	9056A	Total/NA
Sulfate	251	50.0	mg/L	10	9056A	Total/NA
Total Dissolved Solids (TDS)	1430	20.0	mg/L	1	SM 2540C	Total/NA

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# **Method Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2
SDG: AVS NEW WELLS

Method	Method Description	Protocol	Laboratory
6010C	Metals (ICP)	SW846	ETA DEN
6020A	Metals (ICP/MS)	SW846	ETA DEN
7470A	Mercury (CVAA)	SW846	ETA DEN
9056A	Anions, Ion Chromatography	SW846	ETA DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	ETA DEN
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ETA DEN
3020A	Preparation, Total Metals	SW846	ETA DEN
7470A	Preparation, Mercury	SW846	ETA DEN

#### **Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater"
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

#### **Laboratory References:**

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

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# **Sample Summary**

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-164684-1	MW-24S	Water	07/19/22 09:20	07/21/22 09:30
280-164684-2	MW-21S	Water	07/19/22 10:50	07/21/22 09:30
280-164684-3	MW-22S	Water	07/19/22 12:45	07/21/22 09:30
280-164684-4	DUP	Water	07/19/22 12:45	07/21/22 09:30

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Client: Basin Electric Power Cooperative Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

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

Lab Sample ID: 280-164684-1

**Matrix: Water** 

Date Received: 07/21/22 09:30 RL **MDL** Unit D Dil Fac Analyte Result Qualifier Prepared Analyzed 100 08/01/22 14:47 08/02/22 13:26 Boron 123 ug/L 200 08/01/22 14:47 08/02/22 13:26 **Calcium** 4710 ug/L Lithium 58.8 20.0 ug/L 08/01/22 14:47 08/03/22 15:13

Client Sample ID: MW-21S Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Client Sample ID: MW-24S

Date Collected: 07/19/22 09:20

Analyte Result Qualifier RL **MDL** Unit D **Prepared** Analyzed Dil Fac 100 ug/L **Boron** 136 200 08/01/22 14:47 08/02/22 13:30 **Calcium** 4710 ug/L 08/01/22 14:47 08/03/22 15:17 20.0 ug/L Lithium 49.9

Client Sample ID: MW-22S Lab Sample ID: 280-164684-3

Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac 100 Boron 141 ug/L **Calcium** 2590 200 08/01/22 14:47 08/02/22 13:34 ug/L 20.0 08/01/22 14:47 08/03/22 15:21 Lithium 49.9 ug/L

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4 Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte RL Dil Fac Result Qualifier **MDL** Unit D **Prepared** Analyzed **Boron** 143 100 08/01/22 14:47 08/02/22 13:38 ug/L 2500 200 ug/L 08/01/22 14:47 08/02/22 13:38 **Calcium** 1 Lithium 46.6 20.0 ug/L 08/01/22 14:47 08/03/22 15:25

Method: 6020A - Metals (ICP/MS)

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1 Date Collected: 07/19/22 09:20 **Matrix: Water** 

Date Received: 07/21/22	e Received: 07/21/22 09:30									
Analyte	Result Q	ualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
Antimony	ND ND		00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Arsenic	ND	5	5.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Barium	79.4 ^0	<b>6+</b> 1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Beryllium	ND	1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Cadmium	ND	1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Chromium	2.99	2	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Cobalt	1.45	1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Lead	ND	1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Molybdenum	9.16	2	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Selenium	ND	5	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	
Thallium	ND	1	.00		ug/L		07/25/22 14:32	07/26/22 00:59	1	

Client Sample ID: MW-21S Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Antimony ND 2.00 ug/L 07/25/22 14:32 07/26/22 01:03

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

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

Client Sample ID: MW-21S Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Barium	45.5	^6+	1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Beryllium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Cadmium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Chromium	ND		2.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Cobalt	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Lead	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Molybdenum	ND		2.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Selenium	ND		5.00		ug/L		07/25/22 14:32	07/26/22 01:03	1
Thallium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:03	1

Client Sample ID: MW-22S Lab Sample ID: 280-164684-3 Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22	09:30						
Analyte	Result Qualifier	r RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND ND	2.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Arsenic	ND	5.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Barium	59.8 ^6+	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Beryllium	ND	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Cadmium	ND	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Chromium	ND	2.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Cobalt	ND	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Lead	ND	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Molybdenum	ND	2.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Selenium	ND	5.00	ug/L		07/25/22 14:32	07/26/22 01:07	1
Thallium	ND	1.00	ug/L		07/25/22 14:32	07/26/22 01:07	1

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4 Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:3	0								
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Arsenic	ND		5.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Barium	59.7	^6+	1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Beryllium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Cadmium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Chromium	ND		2.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Cobalt	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Lead	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Molybdenum	ND		2.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Selenium	ND		5.00		ug/L		07/25/22 14:32	07/26/22 01:11	1
Thallium	ND		1.00		ug/L		07/25/22 14:32	07/26/22 01:11	1

Method: 7470A - Mercury (CVAA)

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1 Date Collected: 07/19/22 09:20 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte Result Qualifier MDL Unit Prepared Analyzed Mercury ND 0.000200 07/27/22 22:57 07/28/22 19:42 mg/L

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Lab Sample ID: 280-164684-3

**Matrix: Water** 

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Method: 7470A - Mercury (CVAA)

Client: Basin Electric Power Cooperative

Client Sample ID: MW-21S	Lab Sample ID: 280-164684-2
Date Collected: 07/19/22 10:50	Matrix: Water

Date Received: 07/21/22 09:30

Analyte	Result	Qualifier	RL	MDL	Unit	)	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200		ma/L	 07	7/27/22 22:57	07/28/22 19:44	1

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

Client Sample ID: MW-22S

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac D 07/27/22 22:57 07/28/22 19:52 Mercury ND 0.000200 mg/L

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4 **Matrix: Water** 

Date Collected: 07/19/22 12:45 Date Received: 07/21/22 09:30

Analyte Result Qualifier **MDL** Unit Prepared Analyzed RL Dil Fac Mercury ND 0.000200 07/27/22 22:57 07/28/22 19:54 mg/L

**General Chemistry** 

Client Sample ID: MW-24S Lab Sample ID: 280-164684-1 **Matrix: Water** 

Date Collected: 07/19/22 09:20 Data Pacaiyad: 07/21/22 09:30

Date Received: 07/21/22 09:30							
Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	49.4	3.00	mg/L			07/27/22 14:00	1
Fluoride	4.90	0.500	mg/L			07/24/22 10:09	1
Sulfate	44.0	5.00	mg/L			07/27/22 14:00	1
Total Dissolved Solids (TDS)	1960	20.0	mg/L			07/22/22 10:34	1

Client Sample ID: MW-21S Lab Sample ID: 280-164684-2 Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte	Result Qualifier	RL	MDL Unit	D	Prepared	Analyzed	Dil Fac
Chloride	16.1	3.00	mg/L			07/27/22 14:16	1
Fluoride	4.97	0.500	mg/L			07/24/22 10:24	1
Sulfate	624	50.0	mg/L			07/27/22 14:32	10
Total Dissolved Solids (TDS)	2170	20.0	mg/L			07/22/22 10:34	1

Client Sample ID: MW-22S Lab Sample ID: 280-164684-3 Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

Analyte	Result	Qualifier RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.32	3.00		mg/L			07/27/22 14:48	1
Fluoride	4.01	0.500		mg/L			07/24/22 11:12	1
Sulfate	253	50.0		mg/L			07/27/22 15:04	10
Total Dissolved Solids (TDS)	1580	20.0		mg/L			07/22/22 10:34	1

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4

Date Collected: 07/19/22 12:45 Data Pacaiyad: 07/21/22 00:30

Date Received: 07/21/22 09:30									
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.34		3.00		mg/L			07/27/22 15:20	1
Fluoride	4.04		0.500		mg/L			07/24/22 11:28	1
Sulfate	251		50.0		mg/L			07/27/22 15:36	10
Total Dissolved Solids (TDS)	1430		20.0		mg/L			07/22/22 10:34	1
	Analyte Chloride Fluoride Sulfate	Analyte         Result           Chloride         9.34           Fluoride         4.04           Sulfate         251	Analyte Result Qualifier  Chloride 9.34  Fluoride 4.04  Sulfate 251	Analyte         Result Qualifier         RL           Chloride         9.34         3.00           Fluoride         4.04         0.500           Sulfate         251         50.0	Analyte         Result Qualifier         RL 3.00         MDL 3.00           Chloride         9.34         3.00           Fluoride         4.04         0.500           Sulfate         251         50.0	Analyte         Result 9.34         Qualifier         RL MDL Unit           Chloride         9.34         3.00         mg/L           Fluoride         4.04         0.500         mg/L           Sulfate         251         50.0         mg/L	Analyte         Result 9.34         Qualifier 3.00         RL mg/L mg/L mg/L         MDL Unit mg/L mg/L         D           Fluoride         4.04         0.500         mg/L         mg/L           Sulfate         251         50.0         mg/L	Analyte         Result Qualifier         RL 3.00         MDL Unit mg/L mg/L         D Prepared           Chloride         9.34         3.00         mg/L           Fluoride         4.04         0.500         mg/L           Sulfate         251         50.0         mg/L	Analyte         Result Qualifier         RL 3.00         MDL Unit mg/L         D Prepared Manalyzed         Analyzed Mor/27/22 15:20           Chloride         9.34         3.00         mg/L         07/27/22 15:20           Fluoride         4.04         0.500         mg/L         07/24/22 11:28           Sulfate         251         50.0         mg/L         07/27/22 15:36

**Eurofins Denver** 

**Matrix: Water** 

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Method: 6010C - Metals (ICP)

Lab Sample ID: MB 280-582392/1-A

**Matrix: Water** 

**Analysis Batch: 582755** 

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

Client Sample ID: Method Blank

**Prep Type: Total Recoverable** 

**Prep Batch: 582392** 

**Prep Batch: 582392** 

Analyte	Result (	Qualifier R	_ MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND	10	)	ug/L		08/01/22 14:47	08/02/22 12:30	1
Calcium	ND	20	)	ug/L		08/01/22 14:47	08/02/22 12:30	1

Lab Sample ID: MB 280-582392/1-A

Lab Sample ID: LCS 280-582392/2-A

**Matrix: Water** 

**Matrix: Water** 

**Analysis Batch: 582969** 

**Analysis Batch: 582755** 

MB MB

MR MR

Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac ug/L Lithium ND 20.0 08/01/22 14:47 08/03/22 14:48

**Client Sample ID: Lab Control Sample** 

**Prep Type: Total Recoverable** 

**Prep Batch: 582392** 

LCS LCS Spike %Rec Added Result Qualifier Unit Limits Analyte %Rec 2000 86 - 110 Boron 1992 ug/L 100 Calcium 50000 48500 ug/L 97 90 - 111

Lab Sample ID: LCS 280-582392/2-A

**Matrix: Water** 

**Analysis Batch: 582969** 

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

**Prep Batch: 582392** %Rec

Spike LCS LCS Added Analyte Result Qualifier Unit D %Rec Limits Lithium 1000 964.8 ug/L 90 - 112

Method: 6020A - Metals (ICP/MS)

Lab Sample ID: MB 280-581812/1-A

**Matrix: Water** 

Analysis Batch: 581901

**Client Sample ID: Method Blank** 

Prep Type: Total/NA **Prep Batch: 581812** 

MB	MB							
Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
ND		2.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		5.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND	^6+	1.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		1.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		2.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		1.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		1.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		2.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		5.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
ND		1.00		ug/L		07/25/22 14:32	07/25/22 23:26	1
	Result ND	ND ND ^6+ ND ND ND ND ND ND ND ND ND	Result         Qualifier         RL           ND         2.00           ND         5.00           ND         1.00           ND         1.00           ND         1.00           ND         1.00           ND         1.00           ND         2.00           ND         5.00	Result         Qualifier         RL         MDL           ND         2.00         MD           ND         5.00         MD           ND         1.00         MD           ND         1.00         MD           ND         1.00         MD           ND         1.00         MD           ND         2.00         MD           ND         5.00         MD	Result         Qualifier         RL         MDL         Unit           ND         2.00         ug/L           ND         5.00         ug/L           ND         1.00         ug/L           ND         2.00         ug/L           ND         5.00         ug/L	Result         Qualifier         RL         MDL         Unit         D           ND         2.00         ug/L         ug/L         ug/L           ND         5.00         ug/L         ug/L         ug/L           ND         1.00         ug/L         ug/L           ND         1.00         ug/L         ug/L           ND         1.00         ug/L           ND         1.00         ug/L           ND         2.00         ug/L           ND         5.00         ug/L	Result         Qualifier         RL         MDL         Unit         D         Prepared           ND         2.00         ug/L         07/25/22 14:32           ND         5.00         ug/L         07/25/22 14:32           ND         ^6+         1.00         ug/L         07/25/22 14:32           ND         1.00         ug/L         07/25/22 14:32           ND         2.00         ug/L         07/25/22 14:32           ND         1.00         ug/L         07/25/22 14:32           ND         1.00         ug/L         07/25/22 14:32           ND         2.00         ug/L         07/25/22 14:32           ND         2.00         ug/L         07/25/22 14:32           ND         5.00         ug/L         07/25/22 14:32	Result         Qualifier         RL         MDL         Unit         D         Prepared         Analyzed           ND         2.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         5.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         1.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         1.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         2.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         1.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         1.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         1.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         2.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         2.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         2.00         ug/L         07/25/22 14:32         07/25/22 23:26           ND         5.00         ug/L         07/25/22 14:32         07/25/22 23:26

Lab Sample ID: LCS 280-581812/2-A

**Matrix: Water** 

**Analysis Batch: 581901** 

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

**Prep Batch: 581812** 

Spike LCS LCS %Rec Analyte Added Result Qualifier Unit %Rec Limits 40.0 39.48 ug/L 99 85 - 115 Antimony Arsenic 40.0 41.49 ug/L 104 85 - 117

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Page 13 of 24

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

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

Lab Sample ID: LCS 280-581812/2-A

**Matrix: Water** 

**Analysis Batch: 581901** 

**Client Sample ID: Lab Control Sample** 

Prep	Type: Total/NA
Prep	Batch: 581812

	Spike	LCS	LCS				%Rec	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
Barium	40.0	40.67	^6+	ug/L		102	85 - 118	
Cadmium	40.0	38.56		ug/L		96	85 - 115	
Chromium	40.0	41.31		ug/L		103	84 - 121	
Cobalt	40.0	39.54		ug/L		99	85 - 120	
Lead	40.0	39.75		ug/L		99	85 - 118	
Molybdenum	40.0	39.56		ug/L		99	85 - 119	
Selenium	40.0	41.15		ug/L		103	77 - 122	
Thallium	40.0	39.69		ug/L		99	85 - 118	

# Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-582155/1-A

**Matrix: Water** 

**Analysis Batch: 582387** 

**Client Sample ID: Method Blank** 

Prep Type: Total/NA

**Prep Batch: 582155** 

MB MB

Result Qualifier Analyte RI MDL Unit Analyzed Dil Fac Prepared 0.000200 Mercury ND 07/27/22 22:57 07/28/22 19:21 mg/L

Lab Sample ID: LCS 280-582155/2-A

**Matrix: Water** 

**Analysis Batch: 582387** 

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

**Prep Batch: 582155** 

Spike LCS LCS %Rec Added **Analyte** Result Qualifier Unit D %Rec Limits

Mercury 0.00500 0.005004 mg/L 100 84 - 120

#### Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-581758/13

**Matrix: Water** 

**Analysis Batch: 581758** 

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

MB MB

Dil Fac Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed 07/23/22 16:42 Fluoride ND 0.500 mg/L

Lab Sample ID: MB 280-581758/45

**Matrix: Water** 

**Analysis Batch: 581758** 

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

MB MB

Analyte Result Qualifier RL MDL Unit Prepared Analyzed Dil Fac Fluoride  $\overline{\mathsf{ND}}$ 0.500 mg/L 07/24/22 03:32

Lab Sample ID: LC

**Matrix: Water** 

**Analysis Batch: 581758** 

CS 280-581758/43	Client Sample ID: Lab Control Sample
	Prep Type: Total/NA

Spike LCS LCS %Rec %Rec Analyte Added Result Qualifier Limits Fluoride 5.00 5.284 106 90 - 110 mg/L

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

Prep Type: Total/NA

Prep Type: Total/NA

**Prep Type: Total/NA** 

Prep Type: Total/NA

**Prep Type: Total/NA** 

**Prep Type: Total/NA** 

Prep Type: Total/NA

Client Sample ID: Lab Control Sample Dup

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Method Blank

**Client Sample ID: Lab Control Sample** 

Client Sample ID: Lab Control Sample Dup

Client Sample ID: Lab Control Sample

**Client Sample ID: Method Blank** 

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

Lab Sample ID: LCSD 280-581758/44

**Matrix: Water** 

Analysis Batch: 581758

LCSD LCSD RPD Spike %Rec Added Result Qualifier %Rec Limits RPD Limit Analyte Unit D 90 - 110 Fluoride 5.00 5.279 mg/L 106 n 10

Lab Sample ID: MRL 280-581758/10

**Matrix: Water** 

**Analysis Batch: 581758** 

Spike MRL MRL %Rec Added Result Qualifier Unit D %Rec Limits Analyte 0.500 50 - 150 Fluoride 0.6065 mg/L 121

Lab Sample ID: MB 280-582062/6

**Matrix: Water** 

**Analysis Batch: 582062** 

MB MB

Dil Fac Result Qualifier RL MDL Unit Analyte D Prepared Analyzed Chloride  $\overline{\mathsf{ND}}$ 3.00 07/27/22 11:14 mg/L ND Sulfate 5.00 07/27/22 11:14 mg/L

Lab Sample ID: LCS 280-582062/4

**Matrix: Water** 

**Analysis Batch: 582062** 

Spike LCS LCS %Rec Result Qualifier Added Limits Analyte Unit D %Rec 100 100.5 90 - 110 Chloride mg/L 100 100 Sulfate 100.5 mg/L 101 90 - 110

Lab Sample ID: LCSD 280-582062/5

**Matrix: Water** 

**Analysis Batch: 582062** 

Spike LCSD LCSD %Rec **RPD** Analyte Added Result Qualifier Unit %Rec Limits RPD Limit Chloride 100 100.4 mg/L 100 90 - 110 0 10 Sulfate 100 100.5 mg/L 100 90 - 110 10

Lab Sample ID: MRL 280-582062/3

**Matrix: Water** 

**Analysis Batch: 582062** 

Spike MRL MRL %Rec Added Result Qualifier Limits **Analyte** Unit %Rec Chloride 5.00 4.647 93 mg/L 50 - 150 ND Sulfate 5.00 87 50 - 150 mg/L

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

Lab Sample ID: MB 280-581655/1

**Matrix: Water** 

**Analysis Batch: 581655** 

MR MR Analyte

Result Qualifier RL **MDL** Unit D Prepared Analyzed Dil Fac Total Dissolved Solids (TDS) ND 10.0 mg/L 07/22/22 10:34

# **QC Sample Results**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

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

Lab Sample ID: LCS 280-581655/2 Matrix: Water			Client Sample ID: Lab Control Sample Prep Type: Total/NA
Analysis Batch: 581655	Spike	LCS LCS	%Rec

		Spike	LCS	LCS				%Rec	
	Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
l	Total Dissolved Solids (TDS)	500	480.0		mg/L		96	88 - 114	

Lab Sample ID: LCSD 280-581655/3 Matrix: Water Analysis Batch: 581655			•	Client Sa	ample	ID: Lat	Control Prep Ty		•
	Spike	LCSD	LCSD				%Rec		RPD
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
Total Dissolved Solids (TDS)	500	475.0		mg/L		95	88 - 114	1	20

7

0

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12

13

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

# **Metals**

# **Prep Batch: 581812**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	3020A	
280-164684-2	MW-21S	Total/NA	Water	3020A	
280-164684-3	MW-22S	Total/NA	Water	3020A	
280-164684-4	DUP	Total/NA	Water	3020A	
MB 280-581812/1-A	Method Blank	Total/NA	Water	3020A	
LCS 280-581812/2-A	Lab Control Sample	Total/NA	Water	3020A	

# **Analysis Batch: 581901**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	6020A	581812
280-164684-2	MW-21S	Total/NA	Water	6020A	581812
280-164684-3	MW-22S	Total/NA	Water	6020A	581812
280-164684-4	DUP	Total/NA	Water	6020A	581812
MB 280-581812/1-A	Method Blank	Total/NA	Water	6020A	581812
LCS 280-581812/2-A	Lab Control Sample	Total/NA	Water	6020A	581812

# **Prep Batch: 582155**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	7470A	_
280-164684-2	MW-21S	Total/NA	Water	7470A	
280-164684-3	MW-22S	Total/NA	Water	7470A	
280-164684-4	DUP	Total/NA	Water	7470A	
MB 280-582155/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-582155/2-A	Lab Control Sample	Total/NA	Water	7470A	

#### **Analysis Batch: 582387**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	7470A	582155
280-164684-2	MW-21S	Total/NA	Water	7470A	582155
280-164684-3	MW-22S	Total/NA	Water	7470A	582155
280-164684-4	DUP	Total/NA	Water	7470A	582155
MB 280-582155/1-A	Method Blank	Total/NA	Water	7470A	582155
LCS 280-582155/2-A	Lab Control Sample	Total/NA	Water	7470A	582155

#### **Prep Batch: 582392**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total Recoverable	Water	3005A	<del></del> : <del></del> :
280-164684-2	MW-21S	Total Recoverable	Water	3005A	
280-164684-3	MW-22S	Total Recoverable	Water	3005A	
280-164684-4	DUP	Total Recoverable	Water	3005A	
MB 280-582392/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 280-582392/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

# **Analysis Batch: 582755**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total Recoverable	Water	6010C	582392
280-164684-2	MW-21S	Total Recoverable	Water	6010C	582392
280-164684-3	MW-22S	Total Recoverable	Water	6010C	582392
280-164684-4	DUP	Total Recoverable	Water	6010C	582392
MB 280-582392/1-A	Method Blank	Total Recoverable	Water	6010C	582392
LCS 280-582392/2-A	Lab Control Sample	Total Recoverable	Water	6010C	582392

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Page 17 of 24

# **QC Association Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

#### Job ID: 280-164684-2 SDG: AVS NEW WELLS

# **Metals**

# Analysis Batch: 582969

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total Recoverable	Water	6010C	582392
280-164684-2	MW-21S	Total Recoverable	Water	6010C	582392
280-164684-3	MW-22S	Total Recoverable	Water	6010C	582392
280-164684-4	DUP	Total Recoverable	Water	6010C	582392
MB 280-582392/1-A	Method Blank	Total Recoverable	Water	6010C	582392
LCS 280-582392/2-A	Lab Control Sample	Total Recoverable	Water	6010C	582392

# **General Chemistry**

# **Analysis Batch: 581655**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	SM 2540C	
280-164684-2	MW-21S	Total/NA	Water	SM 2540C	
280-164684-3	MW-22S	Total/NA	Water	SM 2540C	
280-164684-4	DUP	Total/NA	Water	SM 2540C	
MB 280-581655/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-581655/2	Lab Control Sample	Total/NA	Water	SM 2540C	
LCSD 280-581655/3	Lab Control Sample Dup	Total/NA	Water	SM 2540C	

# **Analysis Batch: 581758**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	9056A	
280-164684-2	MW-21S	Total/NA	Water	9056A	
280-164684-3	MW-22S	Total/NA	Water	9056A	
280-164684-4	DUP	Total/NA	Water	9056A	
MB 280-581758/13	Method Blank	Total/NA	Water	9056A	
MB 280-581758/45	Method Blank	Total/NA	Water	9056A	
LCS 280-581758/43	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-581758/44	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-581758/10	Lab Control Sample	Total/NA	Water	9056A	

# **Analysis Batch: 582062**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-164684-1	MW-24S	Total/NA	Water	9056A	<del></del>
280-164684-2	MW-21S	Total/NA	Water	9056A	
280-164684-2	MW-21S	Total/NA	Water	9056A	
280-164684-3	MW-22S	Total/NA	Water	9056A	
280-164684-3	MW-22S	Total/NA	Water	9056A	
280-164684-4	DUP	Total/NA	Water	9056A	
280-164684-4	DUP	Total/NA	Water	9056A	
MB 280-582062/6	Method Blank	Total/NA	Water	9056A	
LCS 280-582062/4	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-582062/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-582062/3	Lab Control Sample	Total/NA	Water	9056A	

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Lab Sample ID: 280-164684-1

**Matrix: Water** 

Job ID: 280-164684-2

SDG: AVS NEW WELLS

**Client Sample ID: MW-24S** Date Collected: 07/19/22 09:20 Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DEN
Total Recoverable	Analysis	6010C		1			582755	08/02/22 13:26	MAB	ETA DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DEN
Total Recoverable	Analysis	6010C		1			582969	08/03/22 15:13	KRP	ETA DEN
Total/NA	Prep	3020A			50 mL	50 mL	581812	07/25/22 14:32	MCR	ETA DEN
Total/NA	Analysis	6020A		1			581901	07/26/22 00:59	LMT	ETA DEN
Total/NA	Prep	7470A			30 mL	50 mL	582155	07/27/22 22:57	CEH	ETA DEN
Total/NA	Analysis	7470A		1			582387	07/28/22 19:42	CEH	ETA DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581758	07/24/22 10:09	RAF	ETA DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	582062	07/27/22 14:00	MEC	ETA DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581655	07/22/22 10:34	ASP	ETA DEN

**Client Sample ID: MW-21S** Lab Sample ID: 280-164684-2

Date Collected: 07/19/22 10:50 **Matrix: Water** 

Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DE
Total Recoverable	Analysis	6010C		1			582755	08/02/22 13:30	MAB	ETA DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DEN
Total Recoverable	Analysis	6010C		1			582969	08/03/22 15:17	KRP	ETA DEN
Total/NA	Prep	3020A			50 mL	50 mL	581812	07/25/22 14:32	MCR	ETA DE
Total/NA	Analysis	6020A		1			581901	07/26/22 01:03	LMT	ETA DE
Total/NA	Prep	7470A			30 mL	50 mL	582155	07/27/22 22:57	CEH	ETA DEN
Total/NA	Analysis	7470A		1			582387	07/28/22 19:44	CEH	ETA DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581758	07/24/22 10:24	RAF	ETA DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	582062	07/27/22 14:16	MEC	ETA DE
Total/NA	Analysis	9056A		10	10 mL	10 mL	582062	07/27/22 14:32	MEC	ETA DE
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581655	07/22/22 10:34	ASP	ETA DE

Lab Sample ID: 280-164684-3 **Client Sample ID: MW-22S** Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

_	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DEN
Total Recoverable	Analysis	6010C		1			582755	08/02/22 13:34	MAB	ETA DEN
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DEN
Total Recoverable	Analysis	6010C		1			582969	08/03/22 15:21	KRP	ETA DEN
Total/NA	Prep	3020A			50 mL	50 mL	581812	07/25/22 14:32	MCR	ETA DEN
Total/NA	Analysis	6020A		1			581901	07/26/22 01:07	LMT	ETA DEN
Total/NA	Prep	7470A			30 mL	50 mL	582155	07/27/22 22:57	CEH	ETA DEN
Total/NA	Analysis	7470A		1			582387	07/28/22 19:52	CEH	ETA DEN
Total/NA	Analysis	9056A		1	5 mL	5 mL	581758	07/24/22 11:12	RAF	ETA DEN

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Page 19 of 24

# **Lab Chronicle**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

**Client Sample ID: MW-22S** Lab Sample ID: 280-164684-3 Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		1	10 mL	10 mL	582062	07/27/22 14:48	MEC	ETA DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	582062	07/27/22 15:04	MEC	ETA DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581655	07/22/22 10:34	ASP	ETA DEN

**Client Sample ID: DUP** Lab Sample ID: 280-164684-4

Date Collected: 07/19/22 12:45 **Matrix: Water** 

Date Received: 07/21/22 09:30

	Batch	Batch		Dil	Initial	Final	Batch	Prepared		
Prep Type	Type	Method	Run	Factor	Amount	Amount	Number	or Analyzed	Analyst	Lab
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DE
Total Recoverable	Analysis	6010C		1			582755	08/02/22 13:38	MAB	ETA DE
Total Recoverable	Prep	3005A			50 mL	50 mL	582392	08/01/22 14:47	MCR	ETA DE
Total Recoverable	Analysis	6010C		1			582969	08/03/22 15:25	KRP	ETA DE
Total/NA	Prep	3020A			50 mL	50 mL	581812	07/25/22 14:32	MCR	ETA DE
Total/NA	Analysis	6020A		1			581901	07/26/22 01:11	LMT	ETA DE
Total/NA	Prep	7470A			30 mL	50 mL	582155	07/27/22 22:57	CEH	ETA DE
Total/NA	Analysis	7470A		1			582387	07/28/22 19:54	CEH	ETA DE
Total/NA	Analysis	9056A		1	5 mL	5 mL	581758	07/24/22 11:28	RAF	ETA DE
Total/NA	Analysis	9056A		1	10 mL	10 mL	582062	07/27/22 15:20	MEC	ETA DE
Total/NA	Analysis	9056A		10	10 mL	10 mL	582062	07/27/22 15:36	MEC	ETA DE
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	581655	07/22/22 10:34	ASP	ETA DE

#### **Laboratory References:**

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

Job ID: 280-164684-2

SDG: AVS NEW WELLS

# **Accreditation/Certification Summary**

Client: Basin Electric Power Cooperative

Project/Site: CCR Groundwater - NDS - AVS NEW WELLS

Job ID: 280-164684-2 SDG: AVS NEW WELLS

# **Laboratory: Eurofins Denver**

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

Authority	Pro	ogram	Identification Number	Expiration Date
North Dakota	Sta	ate	R-034	01-08-23
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The following analytes the agency does not o	•	ort, but the laboratory is i	not certified by the governing authority.	This list may include analytes for whi
	•	ort, but the laboratory is i Matrix	not certified by the governing authority.  Analyte	This list may include analytes for whi

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Power Cooperative   Powe	ric Power Cooperative ay 200A	- 222-10	1	E-Mail: Shelb:	v.Turner@	ET.Euroi	finsUS.c	mo			Page	-	1 4
Column   Control State   Control Column   Control Column   Colum	ay 200A						Ana	lysis Red	nested		Job		
Company   Comp		Due Date Requested:		4000110	e de la tr		- 10	L			Pre	servation Co	des:
Companies   Standard Steel   Standard		TAT Requested (days):					S) SIET	pue			<b>∀</b> ⊞ (	ACL NaOH	M - Hexane N - None
The   Decided Sites   Control of Sites   Control		Standard					aM ff	977-WI			20 4	Nitric Acid	P - Na204S Q - Na2SO3
	701-745-7238(Tel)	PO #:				ate	lstoT -	zibasy i			<u>.</u> 6	MeOH Amehlor	R - NB2S203 S - H2S04
Market   North Dakota Sinas   Sensor		wo#			. (0	iluë, s	¥0209	a) (5 penidn				Se Vater	U - Acetone V - MCAA
Sample Date		Project # 28021258			COL	Phoul	(E to 1	ry (3 of			St. Land. St.	EDTA EDA	W - pH 4-5 Z - other (specify)
Sample   Date   Sample   Date   Dat		SSOW#:			y) as		pinm (.	26.Fa2			2 - AG - TAMBER -	Ľ	
Sample Date   Time   Gargue)   Incrementation   Sample Date   Time   Gargue)   Incrementation   Contraction   Co		<u> </u>			MEN mob		10C - Total LH	15_Ra226, 93			redmon la		
2.3.4.5  2.3.6.5  2.3.6.5  2.3.6.5  2.3.6.5  2.3.6.5  2.3.6.5  2.3.6.5  2.3.6.6.4.8.4	Sample Identification		G=grab) e	Laves		23	09 2	€6 C			oī >	Special I	nstructions/Note
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Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) and Elammable Skin Inflant   Poison B									80-16468	34 Chain of	f Custody		
Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)   Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)									-		***		
A No order (specify)  Special Instructions/OC Requirements:    Date:   Time:	ant [		Radiological		Sample	etum To	al (A fe Client	e may be	<b>ssessed If</b> Disposal By	samples are	• retained to	nger than ⁻or	f month) Months
Inquished by:    Date:   Time:   Date:   Time:   Date:   Date:	Jeliverable Requested: I, II, III, IV, Other (specify)				Special	Instruction	ons/QC	Requireme					
DateTime: Company Received by: Company Received by: DateTime: Company Absoluted by: Comp	inquished by:								Method	of Shipment			
Company Received by:    Company Received by:   Date/Time:   Company Received by:   Cooler Temperature(s) *C and Other Remarks:   Company Company Cooler Temperature(s) *C and Other Remarks:   Cooler Temperat	management of the state of the	20-36	<u> </u>	Company	g√/		M	The state of the s	١	Date	7(4/)	BX	2
A No A No A No.:   Company Received by:   Date/Time		Date/Time	3	Сотрапу	<b>A</b>	sived by:				Date/Time:			
Custody Seal No.:		Date/Time.		Company	Rece	sived by:							Сотрапу
					Coole	er Tempera	ıture(s) °C	and Other Re	marks: 0.	1	- CF	10.1	

SHIP DATE: 20JUL22 ACTWGT: 61.00 LB CAD: 251286197/INET4490

**BILL SENDER** 

STANTON, ND 58571 UNITED STATES US

TO SHELBY TURNER EUROFINS TESTAMERICA, DENVER 4955 YARROW ST

--581J20A92FE4A

ARVADA CO 80002

ORIGIN ID:BISA (701) 745-3371 LELAND OLDS STATION BASIN ELECTRIC 3901 HWY 200A

REF: CCR GROUNDWATER - ND SITE





TRK# 7774 3383 0074

THU - 21 JUL 10:30A PRIORITY OVERNIGHT

> 80002 co-us DEN



9711681

. TestAmerica .

eurofins

Custody Seal

=10



8/5/2022

# **Login Sample Receipt Checklist**

Client: Basin Electric Power Cooperative

Job Number: 280-164684-2

**List Source: Eurofins Denver** 

SDG Number: AVS NEW WELLS

Login Number: 164684

List Number: 1

Creator: Roehsner, Karen P

oreator. Noelistier, Nateri F		
Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>True</td> <td></td>	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
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	

2

4

5

7

9

10

12

15



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2616 East Broadway Ave. ~ Bismarck, ND 58501 ~ 800-279-6885 ~ Fax 701-258-9724
1201 Lincoln Hwy. ~ Nevada, IA 50201 ~ 800-362-0855 ~ Fax 515-382-3885

www.MVTL.com



Account #: 2040 Client: Basin Electric Power Cooperative

Workorder: AVS New CCR Wells (2951) PO: 790708-01

Kevin Solie Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, ND 58503

### **Certificate of Analysis**

# **Approval**

All data reported has been reviewed and approved by:

C. Carrell

Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Report Date: Friday, September 9, 2022 3:30:11 PM



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Account #: 2040 Client: Basin Electric Power Cooperative

# **Workorder Summary**

#### **Workorder Comments**

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.



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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 2951001
 Date Collected:
 08/24/2022 10:25
 Matrix:
 Groundwater

 Sample ID:
 MW 24S
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

**Temp @ Receipt (C):** 5.9

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	75.1	mg/L	10	2	08/31/2022 09:41	08/31/2022 09:41	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	09/08/2022 16:33	09/08/2022 11·14	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.16	mg/L	0.1	1	08/25/2022 17:00	08/26/2022 10:38	MDE	MA,NDA	
Calcium	5.11	mg/L	1	1	08/25/2022 17:00	08/30/2022 11:04	MDE	MA,NDA	
Lithium	0.0525	mg/L	0.02	1	08/25/2022 17:00	08/31/2022 14:47	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Arsenic	0.0023	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Barium	0.0750	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Chromium	0.0030	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Lead	0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Molybdenum	0.0119	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:20	MDE	MA,NDA	

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Report Date: Friday, September 9, 2022 3:30:11 PM





RAA

22:31

Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 2951001
 Date Collected:
 08/24/2022 10:25
 Matrix:
 Groundwater

 Sample ID:
 MW 24S
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

0.1

mg/L

Temp @ Receipt (C): 5.9

Method: SM4500-CI-E 2011

Fluoride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	50.2	mg/L	4.0	2	08/30/2022 12:18	08/30/2022 12:18	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Electrical	4 47		0.4	,	08/26/2022	08/26/2022	D 4 4		

Method: USGS I-1750-85	

1.47

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	2020	mg/L	10	1	08/26/2022 15:33	08/26/2022 15:33	RAA	MA,NDA	

22:31





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 2951002
 Date Collected:
 08/24/2022 11:40
 Matrix:
 Groundwater

 Sample ID:
 MW 22S
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

**Temp @ Receipt (C):** 5.9

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	253	mg/L	50	10	08/31/2022 09:32	08/31/2022 09:32	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	09/08/2022 16:33	09/08/2022 11·14	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.16	mg/L	0.1	1	08/25/2022 17:00	08/26/2022 10:38	MDE	MA,NDA	
Calcium	2.72	mg/L	1	1	08/25/2022 17:00	08/30/2022 11:06	MDE	MA,NDA	
Lithium	0.0478	mg/L	0.02	1	08/25/2022 17:00	08/31/2022 14:47	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Barium	0.0591	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:24	MDE	MA,NDA	

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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID: 2951002 **Date Collected:** 08/24/2022 11:40 Matrix: Groundwater Sample ID: MW 22S Date Received: 08/25/2022 15:25 Collector: Client

Temp @ Receipt (C): 5.9

Method: SM4500-CI-E 2011

Method: USGS I-1750-85

	-								
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	13.2	mg/L	2.0	1	08/30/2022 12:07	08/30/2022 12:07	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

08/26/2022

08/26/2022

Fluoride	1.78	mg/L	0.1	1	08/26/2022 22:40	08/26/2022 22:40	RAA

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1660	mg/L	10	1	08/26/2022 15:33	08/26/2022 15:33	RAA	MA,NDA	





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 2951003
 Date Collected:
 08/24/2022 12:55
 Matrix:
 Groundwater

 Sample ID:
 MW 21S
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

Temp @ Receipt (C): 5.9

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	618	mg/L	25	5	08/31/2022 09:33	08/31/2022 09:33	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	09/08/2022 16:33	09/08/2022 11·14	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.14	mg/L	0.1	1	08/25/2022 17:00	08/26/2022 10:39	MDE	MA,NDA	
Calcium	5.43	mg/L	1	1	08/25/2022 17:00	08/30/2022 11:08	MDE	MA,NDA	
Lithium	0.0481	mg/L	0.02	1	08/25/2022 17·00	08/31/2022 14·48	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Barium	0.0465	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Molybdenum	0.0028	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:28	MDE	MA,NDA	

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Report Date: Friday, September 9, 2022 3:30:11 PM



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Account #: 2040 Client: Basin Electric Power Cooperative

mg/L

**Analytical Results** 

 Lab ID:
 2951003
 Date Collected:
 08/24/2022 12:55
 Matrix:
 Groundwater

 Sample ID:
 MW 21S
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

0.1

Temp @ Receipt (C): 5.9

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	18.9	mg/L	2.0	1	08/30/2022 12:09	08/30/2022 12:09	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

1

08/26/2022

22:50

08/26/2022

22:50

RAA

Method: USGS I-1750-85

1.49

Fluoride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	2220	mg/L	10	1	08/26/2022 15:33	08/26/2022 15:33	RAA	MA,NDA	





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 2951004
 Date Collected:
 08/24/2022 11:40
 Matrix:
 Groundwater

 Sample ID:
 Dup
 Date Received:
 08/25/2022 15:25
 Collector:
 Client

Temp @ Receipt (C): 5.9

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	240	mg/L	50	10	08/31/2022 09:34	08/31/2022 09:34	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	09/08/2022 16:33	09/08/2022 11·14	MDE	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.15	mg/L	0.1	1	08/25/2022 17:00	08/26/2022 10:39	MDE	MA,NDA	
Calcium	2.85	mg/L	1	1	08/25/2022 17:00	08/30/2022 11:10	MDE	MA,NDA	
Lithium	0.0472	mg/L	0.02	1	08/25/2022 17:00	08/31/2022 14:48	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Barium	0.0587	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	08/25/2022 17:00	08/30/2022 14:32	MDE	MA,NDA	

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Report Date: Friday, September 9, 2022 3:30:11 PM



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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID: 2951004 **Date Collected:** 08/24/2022 11:40 Matrix: Groundwater Sample ID: 08/25/2022 15:25 Date Received: Collector: Client Dup

Temp @ Receipt (C): 5.9

Method: SM4500-CI-E 2011

Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	13.3	mg/L	2.0	1	08/30/2022 12:10	08/30/2022 12:10	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

Fluoride	1.76	mg/L	0.1	1	08/26/2022 22:58	08/26/2022 22:58	RAA

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1640	mg/L	10	1	08/26/2022 15:33	08/26/2022 15:33	RAA	MA,NDA	





Account #: 2040 Client: Basin Electric Power Cooperative

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	BASIN ELECTRIC PO Leland Olds Sta 3901 HIGHWAY 3 STANTON, ND 5	WER COOP. ation 200A 8571			Con Key Nam	tact	: Ser	nple	r:			E	mail RSoli	م . ا و		. /aknut	on 745-723 son@bepc.
Intelope Att: Li	valley Station rabilities ty 15, Beulah,				Quo	te N	lumb Nam	oer '	mbe		1EL	25			te Submitt 名 - 25 - c rchase Ord	22	
. ,	Sample Informati			Y or(N)		_	746			e Ty						Analys	is
Lab Use Only Lab Number	Sample ID	Sample Matrix PW- Potable Water GW - Groundwater WW - Wastewater SW - Surface Water S - Soil/Sludge O - Other	Date Sampled	Time	Untreated	Sterile	500 ml HNO3	250 ml H2SO4	1000 ml NaOH	Amber HCI	Amber Unpres.	VOC Vials HCI	Amber H2SO4	Other:	A	nalysis Re	quired
001	mw 245	GW	8-24-22	1025			XX	/						X		CI,F.	Sou TOS
500	mw 225	GW	8-24-22	1140			XX	(						X	5b, A	s, Ba,	Be, Cd
203	mw 215	GW	8-24-22				< χ							X	CR, C	o, Pb,	Li, Ha
004	DUP	CW	8-24-22	1140			XX					+		X	mo, 5	Se, TL,	Soy, Tos Be, Cd Li, Hg RADIUM
												+	+				
							ı										×
omments	:																
	Transferred by:	Date:	Time:	Sample C	ondi	tion	:		Re	ceiv	/ed	γ:		70	Date:	Time: 1525	Temp: 5.9°C

Please submit the top two copies with your samples. We will return the completed original with your results.

Form # 80-90003-1 See above for page number Effective Date: 15 Jan 2018

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Account #: 2040 Client: Basin Electric Power Cooperative

**Workorder**: AVS 160 (3569) **PO**: 790708-01

Kevin Solie Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, ND 58503

### **Certificate of Analysis**

# **Approval**

All data reported has been reviewed and approved by:

C. Carriell

Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2040 Client: Basin Electric Power Cooperative

# **Workorder Summary**

#### **Workorder Comments**

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

#### **Sample Comments**

3569004 (Dup) - Sample

Time sampled was not supplied by the client.





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 3569001
 Date Collected:
 09/28/2022 09:20
 Matrix:
 Groundwater

 Sample ID:
 MW 22S
 Date Received:
 09/29/2022 15:51
 Collector:
 Client

Temp @ Receipt (C): 2.2

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	224	mg/L	50	10	10/05/2022 11:17	10/05/2022 11:17	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	10/06/2022 09·20	10/06/2022 12·13	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.14	mg/L	0.1	1	09/30/2022 17:00	10/07/2022 11:07	MDE	MA,NDA	
Calcium	2.66	mg/L	1	1	09/30/2022 17:00	10/10/2022 12:06	SLZ	MA,NDA	
Lithium	0.0442	mg/L	0.02	1	09/30/2022 17:00	10/06/2022 10:33	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/18/2022 10:13	CC	MA,NDA	
Barium	0.0602	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:55	MDE	MA,NDA	

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Page 3 of 11





Account #: 2040 Client: Basin Electric Power Cooperative

Units

mg/L

Results

1.69

**Analytical Results** 

 Lab ID:
 3569001
 Date Collected:
 09/28/2022 09:20
 Matrix:
 Groundwater

 Sample ID:
 MW 22S
 Date Received:
 09/29/2022 15:51
 Collector:
 Client

**RDL** 

0.1

Temp @ Receipt (C): 2.2

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	13.0	mg/L	2.0	1	10/03/2022 11:47	10/03/2022 11:47	EJV	MA,NDA	
Method: SM4500-F-C-2011									

DF

1

Prepared

00:12

09/30/2022

Analyzed

00:12

09/30/2022

By

RAA

Cert

Qual

Method: USGS I-1750-85

**Parameter** 

Fluoride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1630	mg/L	10	1	09/30/2022 17:00	09/30/2022 17:00	RAA	MA,NDA	_





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 3569002
 Date Collected:
 09/28/2022 10:45
 Matrix:
 Groundwater

 Sample ID:
 MW 24S
 Date Received:
 09/29/2022 15:51
 Collector:
 Client

Temp @ Receipt (C): 2.2

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	52.6	mg/L	10	2	10/05/2022 11:39	10/05/2022 11:39	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	10/06/2022	10/06/2022	AMC	MA,NDA,	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.12	mg/L	0.1	1	09/30/2022 17:00	10/07/2022 11:08	MDE	MA,NDA	
Calcium	5.44	mg/L	1	1	09/30/2022 17:00	10/10/2022 12:08	SLZ	MA,NDA	
Lithium	0.0478	mg/L	0.02	1	09/30/2022 17:00	10/06/2022 10:34	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Arsenic	0.0022	mg/L	0.002	5	09/30/2022 17:00	10/18/2022 10:38	CC	MA,NDA	
Barium	0.0868	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Chromium	0.0052	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Cobalt	0.0020	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Lead	0.0008	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Molybdenum	0.0102	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 16:59	MDE	MA,NDA	

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Page 5 of 11



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Account #: 2040 Client: Basin Electric Power Cooperative

Units

mg/L

**Analytical Results** 

Lab ID: 3569002 **Date Collected:** 09/28/2022 10:45 Matrix: Groundwater Sample ID: MW 24S Date Received: 09/29/2022 15:51 Collector: Client

**RDL** 

0.1

Temp @ Receipt (C): 2.2

Method: SM4500-CI-E 2011

Method: USGS I-1750-85

**Parameter** 

Fluoride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	52.5	mg/L	2.0	1	10/03/2022 11:48	10/03/2022 11:48	EJV	MA,NDA	
Method: SM4500-F-C-2011									

DF

1

Prepared

09/30/2022

Analyzed

00:18

09/30/2022

By

RAA

Cert

Qual

Fluoride	1.41	mg/L	0.1	1	00:18

Results

1.41

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1980	mg/L	10	1	09/30/2022 17:00	09/30/2022 17:00	RAA	MA,NDA	





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 3569003
 Date Collected:
 09/28/2022 12:15
 Matrix:
 Groundwater

 Sample ID:
 MW 21S
 Date Received:
 09/29/2022 15:51
 Collector:
 Client

Temp @ Receipt (C): 2.2

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	581	mg/L	25	5	10/05/2022 11:27	10/05/2022 11:27	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	10/06/2022 09·20	10/06/2022 12·13	AMC	MA,NDA, SDA	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.14	mg/L	0.1	1	09/30/2022 17:00	10/07/2022 11:10	MDE	MA,NDA	
Calcium	5.12	mg/L	1	1	09/30/2022 17:00	10/10/2022 12:10	SLZ	MA,NDA	
Lithium	0.0460	mg/L	0.02	1	09/30/2022 17:00	10/06/2022 10:35	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Arsenic	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/18/2022 10:17	CC	MA,NDA	
Barium	0.0484	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Chromium	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Lead	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Molybdenum	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:19	MDE	MA,NDA	

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Account #: 2040 Client: Basin Electric Power Cooperative

Units

Results

**Analytical Results** 

**Date Collected:** Lab ID: 3569003 09/28/2022 12:15 Matrix: Groundwater Sample ID: MW 21S Date Received: 09/29/2022 15:51 Collector: Client

Temp @ Receipt (C): 2.2

Method: SM4500-CI-E 2011

Method: USGS I-1750-85

**Parameter** 

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	18.5	mg/L	2.0	1	10/03/2022 11:49	10/03/2022 11:49	EJV	MA,NDA	
Method: SM4500-F-C-2011									

DF

Prepared

09/30/2022

Analyzed

09/30/2022

By

Cert

Qual

Fluoride	1.41	mg/L	0.1	1	09/30/2022 00:24	09/30/2022 00:24	RAA

**RDL** 

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	2200	mg/L	10	1	09/30/2022 17:00	09/30/2022 17:00	RAA	MA,NDA	





Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID:3569004Date Collected:10/18/2022Matrix:GroundwaterSample ID:DupDate Received:09/29/2022 15:51Collector:Client

Temp @ Receipt (C): 2.2

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	53.3	mg/L	10	2	10/05/2022 11:46	10/05/2022 11:46	EJV	MA,NDA	

Method: EPA 245.1

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Mercury	<0.0002	mg/L	0.0002	1	10/06/2022	10/06/2022	AMC	MA,NDA,	

Method: EPA 6010D

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.12	mg/L	0.1	1	09/30/2022 17:00	10/07/2022 11:10	MDE	MA,NDA	
Calcium	5.40	mg/L	1	1	09/30/2022 17:00	10/10/2022 12:11	SLZ	MA,NDA	
Lithium	0.0476	mg/L	0.02	1	09/30/2022 17:00	10/06/2022 10:36	SLZ	NDA	

Method: EPA 6020B

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Antimony	<0.001	mg/L	0.001	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Arsenic	0.0020	mg/L	0.002	5	09/30/2022 17:00	10/18/2022 10:50	CC	MA,NDA	
Barium	0.0862	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Beryllium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Cadmium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Chromium	0.0053	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Cobalt	<0.002	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Lead	0.0008	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Molybdenum	0.0100	mg/L	0.002	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Selenium	<0.005	mg/L	0.005	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	
Thallium	<0.0005	mg/L	0.0005	5	09/30/2022 17:00	10/14/2022 17:23	MDE	MA,NDA	

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Report Date: Thursday, November 3, 2022 3:39:36 PM



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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID: 3569004 **Date Collected:** 10/18/2022 Matrix: Groundwater Sample ID: Date Received: 09/29/2022 15:51 Collector: Client Dup

Temp @ Receipt (C): 2.2

Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	51.9	mg/L	2.0	1	10/03/2022 11:50	10/03/2022 11:50	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual

09/30/2022

00:30

09/30/2022

00:30

RAA

Fluoride	1.40	mg/L	0.1	1

Method: USGS I-1750-85									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1990	mg/L	10	1	09/30/2022 17:00	09/30/2022 17:00	RAA	MA,NDA	

1

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Effective Date: 15 Jan 2018

Account #: 2040 Client: Basin Electric Power Cooperative

MV				atories,	WO: 3509							r Coo	pera	Gustody Record					
	BASIN ELECTRIC PO Leland Olds St 3901 HIGHWAY STANTON, ND	tation 200A			Со	ntac Kei	t:	So						Em	ail:	2	02-5094 bepc.com	, AARON Aknutsu	745-7:23; ~ @bepc.c
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		Sample Matrix	Filtered	YorN						Н		-	_		_				
Lab Use Only Lab Number	Sample ID	PW- Potable Water GW - Groundwater WW - Wastewater SW - Surface Water S - Soil/Sludge O- Other	Date Sampled	Time Sampled	Untreated	Sterile	500 ml HNO3	1000 ml H2SO4	250 ml H2SO4	1000 ml NaOH	Amber HCI	Amber Unpres.	VOC Vials HCI	Amber H2SO4	40 ml Vials H2SO4	Other:	A	nalysis Rec	uired
100	mw a25	GW	9-28-22	0920	X		X									X	B,Ca	C1, F, S	04 TD
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See above for page number

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Form # 80-90003-1



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Account #: 2040 Client: Basin Electric Power Cooperative

**Workorder**: AVS 160 (4838) **PO**: 790708-01

Kevin Solie Basin Electric Power Cooperative 1717 E Interstate Ave Bismarck, ND 58503

### **Certificate of Analysis**

# **Approval**

All data reported has been reviewed and approved by:

C. Carriell

Claudette Carroll, Lab Manager Bismarck, ND

Analyses performed under Minnesota Department of Health Accreditation conforms to the current TNI standards.

NEW ULM LAB CERTIFICATIONS: MN LAB # 027-015-125 ND WW/DW # R-040

BISMARCK LAB CERTIFICATIONS: MN LAB # 038-999-267 ND W/DW # ND-016

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Account #: 2040 Client: Basin Electric Power Cooperative

# **Workorder Summary**

#### **Workorder Comments**

All analytes with dilution factors greater than 1 (displayed in DF column) required dilution due to matrix or high concentration of target analyte unless otherwise noted and reporting limits (RDL column) have been adjusted accordingly.

#### **Sample Comments**

4838007 (Dup) - Sample

Time sampled was not supplied by the client.



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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID: 4838001 **Date Collected:** 10/26/2022 13:20 Matrix: Groundwater 10/27/2022 15:11 Sample ID: MW15S Date Received: Collector: Client

Temp @ Receipt (C): 1.5

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	404	mg/L	25	5	11/04/2022 14:08	11/04/2022 14:08	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.10	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 09:49	MDE	MA,NDA	
Calcium	4.27	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:10	MDE	MA,NDA	
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	14.4	mg/L	2.0	1	10/31/2022 10:53	10/31/2022 10:53	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.41	mg/L	0.1	1	10/28/2022 20:05	10/28/2022 20:05	AMC		
Method: USGS I-1750-85									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1880	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	

15:30



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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

**Date Collected:** Lab ID: 4838002 10/26/2022 12:40 Matrix: Groundwater Sample ID: MW16S Date Received: 10/27/2022 15:11 Collector: Client

Temp @ Receipt (C): 1.5

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	79.0	mg/L	25	5	11/04/2022 14:09	11/04/2022 14:09	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.12	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 09:55	MDE	MA,NDA	
Calcium	3.26	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:13	MDE	MA,NDA	

#### Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	22.6	mg/L	2.0	1	10/31/2022 10:54	10/31/2022 10:54	EJV	MA,NDA	

#### Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.83	mg/L	0.1	1	10/28/2022 20·12	10/28/2022 20:12	AMC		

## Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1180	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	

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Report Date: Tuesday, November 22, 2022 5:56:33 PM



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2040 Account #: Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID: 4838003 **Date Collected:** 10/26/2022 11:45 Matrix: Groundwater Sample ID: MW17S Date Received: 10/27/2022 15:11 Collector: Client

Temp @ Receipt (C): 1.5

Method: ASTM D516-16									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	247	mg/L	25	5	11/04/2022 14:10	11/04/2022 14:10	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.1	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 09:56	MDE	MA,NDA	
Calcium	3.59	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:15	MDE	MA,NDA	
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	15.0	mg/L	2.0	1	10/31/2022 10:55	10/31/2022 10:55	EJV	MA,NDA	

Method:	SM4500-	F-C-2011
welliou.	314300-	F-G-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.38	mg/L	0.1	1	10/28/2022 20:20	10/28/2022 20:20	AMC		_

10:55

10:55

#### Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1740	mg/L	10	1	10/31/2022 15 <sup>.</sup> 30	10/31/2022 15 <sup>.</sup> 30	RAA	MA,NDA	

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EJV

10:56

MA,NDA

Account #: 2040 Client: **Basin Electric Power Cooperative** 

**Analytical Results** 

Lab ID: 4838004 **Date Collected:** 10/26/2022 09:34 Matrix: Groundwater Sample ID: **MW18S** Date Received: 10/27/2022 15:11 Collector: Client

Temp @ Receipt (C): 1.5

Method: ASTM D516-16									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	450	mg/L	25	5	11/04/2022 14:12	11/04/2022 14:12	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	<0.1	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 09:58	MDE	MA,NDA	
Calcium	3.60	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:17	MDE	MA,NDA	
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	8.8	ma/l	2.0	1	10/31/2022	10/31/2022	F.IV	MA NDA	

#### Method: SM4500-F-C-2011

8.8

Chloride

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.17	mg/L	0.1	1	10/28/2022 20:28	10/28/2022 20:28	AMC		_

10:56

2.0

mg/L

#### Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1730	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	

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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 4838005
 Date Collected:
 10/26/2022 10:55
 Matrix:
 Groundwater

 Sample ID:
 MW19S
 Date Received:
 10/27/2022 15:11
 Collector:
 Client

Temp @ Receipt (C): 1.5

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	785	mg/L	25	5	11/04/2022 14:13	11/04/2022 14:13	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.10	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 10:00	MDE	MA,NDA	
Calcium	3.97	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:20	MDE	MA,NDA	
Method: SM4500-CI-E 2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	18.2	mg/L	2.0	1	10/31/2022 10:57	10/31/2022 10:57	EJV	MA,NDA	
Method: SM4500-F-C-2011									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
					10/28/2022	10/28/2022			

Method:	<b>USGS</b>	I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	2190	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	

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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

 Lab ID:
 4838006
 Date Collected:
 10/26/2022 13:55
 Matrix:
 Groundwater

 Sample ID:
 MW20S
 Date Received:
 10/27/2022 15:11
 Collector:
 Client

Temp @ Receipt (C): 1.5

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	55.0	mg/L	25	5	11/04/2022 14:14	11/04/2022 14:14	EJV	MA,NDA	
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.10	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 10:01	MDE	MA,NDA	
Calcium	4.20	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:26	MDE	MA,NDA	

#### Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	26.2	mg/L	2.0	1	10/31/2022 11·07	10/31/2022 11:07	EJV	MA,NDA	

#### Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	1.14	mg/L	0.1	1	10/28/2022 20·43	10/28/2022 20:43	AMC		_

#### Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	1800	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	

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Account #: 2040 Client: Basin Electric Power Cooperative

**Analytical Results** 

Lab ID:4838007Date Collected:11/02/2022Matrix:GroundwaterSample ID:DupDate Received:10/27/2022 15:11Collector:Client

Temp @ Receipt (C): 1.5

Method: ASTM D516-16

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Sulfate	793	ma/l 25 5		11/04/2022 14:15	EJV	MA,NDA			
Method: EPA 6010D									
Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Boron	0.10	mg/L	0.1	1	10/31/2022 17:12	11/09/2022 10:03	MDE	MA,NDA	
Calcium	3.93	mg/L	1	1	10/31/2022 17:12	11/02/2022 14:32	MDE	MA,NDA	

#### Method: SM4500-CI-E 2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Chloride	18.2	mg/L	2.0	1	10/31/2022 11:08	10/31/2022 11:08	EJV	MA,NDA	

#### Method: SM4500-F-C-2011

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Fluoride	0.64	mg/L	0.1	1	10/28/2022 20:51	10/28/2022 20:51	AMC		

#### Method: USGS I-1750-85

Parameter	Results	Units	RDL	DF	Prepared	Analyzed	Ву	Cert	Qual
Total Dissolved Solids	2190	mg/L	10	1	10/31/2022 15:30	10/31/2022 15:30	RAA	MA,NDA	_

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H: Lia	bilities y 15, Beulah, NA	,			Qu	ote	Nui	me	/Nui	mbe	er:					Date Submi	7 - ユユ rder #:	AVS				
	Sample Informa	tion				111		40		ottle	е Ту	pe			_	1101						
P. C. P. S. C.	oumpie imorina		Filtered	Y or N											1		Analys	SIS				
Lab Use Only Lab Number	Sample ID	Sample Matrix PW- Potable Water GW - Groundwater WW - Wastewater SW - Surface Water S - Soil/Sludge O- Other	Date Sampled	Time Sampled	Untreated	Sterile	500 ml HNO3	1000 ml H2SO4	250 ml H2SO4	1000 ml NaOH	Amber HCI	Amber Unpres.	VOC Vials HCI	Amber H2SO4	40 mi viais HzsO4	Other:	Analysis Re	quired				
101	mw 15 s	GW	10-26-22	1320	X		X											e, Fluoria				
202	mw 165	GW	10-26-22	1240	$\chi$		X					2				Sulfa	Ac. Calei	um, Boron				
64	mw 175	6 W	10-26-22	1145	X		χ											,				
04	mw 185	GW	10-26-22	0934	Υ'		X															
X15	mw 195	GW	10-26-22	1055	X!		X															
106	mw aos	6w	10-26-22	1355	X		X															
107	Dep		10-26-22									_	4	4	+							
omments																						
	Transferred by:	Date:	Time:	Sample C	onc	litio	n:	_	1/		ceiv		by:		T	Date:	Time:	Temp:				
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MVTL guarantees the accuracy of the analysis done on the sample submitted for testing. It is not possible for MVTL to guarantee that a test result obtained on a particular sample will be the same on any other sample unless all conditions affecting the sample are the same, including sampling by MVTL. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

# **Attachment B**

# Input Data Files for Calculation of Upper and Lower Prediction Limits (2016-2020)

Attachment B
Input Data Files for Calcualtion of Upper and Lower Prediciton Limits
Background Wells: MW-18(S) and MW-19(S)
Antelope Valley Station - Beulah, ND

		Sample	Sample															
Event	Well ID	Date	Type	Sample Name	Boron	D Boron	Calcium	D Calcium	Chloride	D Chloride	Fluoride	D Fluoride	рН	Hq D	Sulfate	D Sulfate	TDS	D TDS
2016 07 July		7/13/2016 N		MW-18(S)-071316	0.11	1	12	1	5.6	1	1.2	1	9.97	1	370	1	1600	1
2017 02 Feb	` ,			MW-18(S)-022417	0.2	0	21	1	30	0	5	0	9.85	1	330	1	1100	1
2017 03 Mar	\ /	3/21/2017 N		MW-18(S)-032117	0.2	0	21	1	15	0	2.5	0	9.34	1	360	1	1400	1
2017 04 Apr	\ /			MW-18(S)-042017	0.2	0	13	1	15	0	2.5	0	10.03	1	390	1	1400	1
2017 05 May	. ,		J	MW-18(S)-052317	0.2	0	12	1	5.4	1	1.7	1	8.86	1	350	1	1400	1
2017_06_Jun	MW-18(S)	6/28/2017 N	J	MW-18(S)-062817	0.2	0	12	1					9.1	1			1300	1
2017_07_Jul	MW-18(S)	7/24/2017 N	I	MW-18(S)-072417	0.2	0	12	1					8.91	1			1400	1
2017_08_Aug	MW-18(S)	8/17/2017 N	1	MW-18(S)-081717	0.2	0	9.7	1	5.4	1	1.8	1	8.92	1	370	1	1300	1
2017_10_Oct	MW-18(S)	10/10/2017 N	1	MW-18(S)-101017					5.6	1	1.6	1	9.05	1	360	1		
2017_10_Oct	MW-18(S)	10/12/2017 N	1	MW-18(S)-101217					5.8	1	1.9	1	9.14	1	360	1		
2018_04_Apr	MW-18(S)	4/25/2018 N	1	MW-18(S)-042518	0.14	1	10	1	7	1	2	1	9	1	320	1	1200	1
2018_10_Oct	MW-18(S)	10/10/2018 N	1	MW-18(S)_101018	0.136	1	8.6	1	6.8	1	1.85	1	9.35	1	319	1	1510	1
2019_05_May	MW-18(S)	5/21/2019 N	1	MW-18(S)-052119	0.136	1	9.85	1	7.99	1	2.06	1	8.89	1	282	1	1210	1
2019_10_Oct	MW-18(S)	10/16/2019 N	1	MW-18(S)-101619	0.127	1	9.56	1	6.31	1	1.6	1	9.33	1	263	1	1230	1
2020_06_June	MW-18(S)	6/11/2020 N	J	MW-18(S)_061120	0.118	1	13	1	4.94	1	1.29	1	9.95	1	346	1		
2020_10_Oct	MW-18(S)	10/28/2020 N	J	MW18 (5)_102820	0.12	1	5.93	1	4.65	1	1.28	1	9.11	1	356	1	1670	1
2016_07_July	MW-19(S)	7/13/2016 N	J	MW-19(S)-071316	0.11	1	13	1	12	1	0.5	1	7.93	1	680	1	1900	1
2017_02_Feb	MW-19(S)	2/2/2017 N	1	MW-19(S)-020217	0.2	0	5.4	1	12	1	0.58	1	7.8	1	670	1	2000	1
2017_02_Feb	MW-19(S)	2/24/2017 N	1	MW-19(S)-022417	0.2	0	5.5	1	12	1	0.56	1	7.73	1	700	1	2000	1
2017_03_Mar	MW-19(S)	3/21/2017 N	J	MW-19(S)-032117	0.2	0	6.9	1	15	0	2.5	0	7.77	1	690	1	1900	1
2017_04_Apr	MW-19(S)	4/20/2017 N		MW-19(S)-042017	0.2	0	5.9	1	15	0	2.5	0	8.8	1	630	1	2000	1
2017_05_May	` '	5/23/2017 N		MW-19(S)-052317	0.2	0	5.6	1	11	1	0.51	1	7.61	1	630	1	2000	1
2017_06_Jun	MW-19(S)	6/28/2017 N		MW-19(S)-062817	0.2	0	5.7	1					7.59	1			1900	1
2017_07_Jul	MW-19(S)			MW-19(S)-072417	0.2	0	5	1					7.33	1			1900	1
2017_08_Aug	` ,			MW-19(S)-081717	0.2	0	4.9	1	12	1	0.64	1	7.4	1	620	1	1800	1
2017_10_Oct				MW-19(S)-101017					12	1	0.56	1	7.73	1	660	1		
2017_10_Oct	MW-19(S)	10/12/2017 N	1	MW-19(S)-101217					12	1	0.65	1	7.8	1	670	1		
2018_04_Apr	MW-19(S)	4/25/2018 N	1	MW-19(S)-042518	0.16	1	4.6	1	12	1	0.63	1	8.05	1	660	1	2000	1
2018_10_Oct	` ,		1	MW-19(S)_101018	0.154	1	4.34	1	12.7	1	0.56	1	8.63	1	669	1	2010	1
2019_05_May	` '			MW-19(S)-052119	0.147	1	4.02	1	13.1	1	0.605	1	7.38	1	683	1	2110	1
2019_10_Oct	` '			MW-19(S)-101619	0.144	1	3.97	1	12.7	1	0.532	1	8.37	1	666	1	2020	1
2020_06_June	` ,			MW-19(S)_061120	0.142	1	3.94	1	10.6	1	0.559	1	7.95	1	642	1	1990	1
2020_10_Oct	MW-19(S)	10/28/2020 N	1	MW19 (6)_102820	0.155	1	4.48	1	11.3	1	0.588	1	7.8	1	707	1	2190	1



