2024 Annual Groundwater Monitoring and Corrective Action Report

Laramie River Station
Wheatland, Wyoming

Basin Electric Power Cooperative

Project number: 60732883

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Basin Electric Power Cooperative
Bismarck, North Dakota

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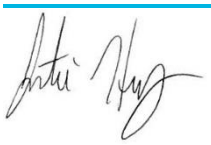	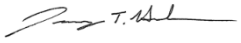		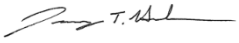
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List of Acronyms

95% LCL	95 percent lower confidence limit
ACM	Assessment of Corrective Measures
AECOM	AECOM Technical Services, Inc.
annual report	annual groundwater monitoring and corrective action report
ASD	alternative source demonstration
Basin	Basin Electric Power Cooperative
bgs	below ground surface
CCR	coal combustion residuals
CFR	Code of Federal Regulations
ft	feet
ft/day	feet per day
GWPS	groundwater protection standard
LRS	Laramie River Station
SSI	statistically significant increase
SSL	statistically significant levels
TDS	total dissolved solids
UPL	upper prediction limit
U.S.	United States

Executive Summary

This report summarizes groundwater monitoring and corrective action activities completed between January 1 and December 31, 2024 for the coal combustion residuals (CCR) units at the Basin Electric Power Cooperative (Basin) Laramie River Station (LRS), as required by 40 Code of Federal Regulations (CFR) § 257.90(e) of the United States (U.S.) Environmental Protection Agency CCR rule. The CCR units subject to the rule include:

- Bottom Ash Pond 1;
- Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill Multi-unit; and
- Emergency Holding Ponds Multi-unit.

Site figures illustrating the location of the CCR units and program monitoring networks for the CCR units are presented as **Figures 1** and **2**, respectively. During the reporting period, monitoring well MW-53B was abandoned and replaced with MW-53BR, this was the only change to the program monitoring wells during the reporting period.

Basin implemented an Assessment monitoring program for Bottom Ash Pond 1 and the two CCR multi-units (Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill and Emergency Holding Ponds) in the spring of 2018, in response to the identification of statistically significant increases (SSIs) of Appendix III constituents in downgradient monitoring wells. Assessment monitoring was in place for all three units/multi-units at the start and end of the current annual reporting period (2024).

Assessment monitoring of the Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill Multi-unit in 2024 found that concentrations of two Appendix III constituents (calcium and fluoride), and nine Appendix IV constituents (arsenic, barium, chromium, cobalt, fluoride, lead, molybdenum, radium 226/228 combined, and selenium) exhibited SSIs above background values at select monitoring wells. No SSIs identified at the Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill Multi-unit exceeded groundwater protection standards (GWPSs).

Assessment monitoring of the Emergency Holding Ponds Multi-unit in 2024 found that concentrations of one Appendix III constituent (fluoride), and three Appendix IV constituents (barium, chromium, and fluoride exhibited SSIs above the background values at select monitoring wells. No SSIs identified at the Emergency Holding Ponds Multi-unit exceeded GWPSs.

Assessment monitoring of the Bottom Ash Pond 1 Unit found that concentrations of five Appendix III constituents (boron, calcium, chloride, sulfate, and total dissolved solids [TDS]) and four Appendix IV constituents (chromium, lithium, molybdenum, and selenium) exhibited SSIs above background levels at select monitoring wells. Lithium at monitoring wells MW-38B and MW-21B and molybdenum at monitoring well MW-38B additionally exceeded GWPSs. Downgradient well(s) with a constituent or constituents reported above GWPSs at a statistically significant level (SSL) are as follows:

Appendix IV Constituent	Unit/Multi-Unit	Downgradient Well(s) GWPS SSL Exceedance
Lithium and molybdenum	Bottom Ash Pond 1	MW-38B

For context, previously as required by the CCR rule, an assessment of corrective measures (ACM) was conducted and a public meeting open to interested and affected parties was held on January 30, 2020 to discuss the results of the ACM. After completion of the ACM, work was initiated on the Selection of Remedy for the impacted groundwater as required by 40 CFR § 257.97. A Groundwater Remedy Selection Report was prepared and issued in July 2020 (AECOM Technical Services, Inc. [AECOM] 2020), after which work was initiated on the design and implementation of the following selected remedy:

- Bottom Ash Pond 1 retrofit, hydraulic capture of impacted groundwater, and treatment of the captured groundwater in the new zero-discharge Pond 1.

Cleanout and retrofit of Bottom Ash Pond 1, which essentially eliminated the source of impact to groundwater was completed in March 2021. Installation and hydraulic testing of extraction wells for the hydraulic capture system was

completed in December 2021. The hydraulic capture pumping system was designed in 2022 and contracting for installation of the system was initiated in 2022. Installation of the pumping system began in summer 2023 and initiation of pumping on a continual basis began on July 24, 2024, once final system components were installed.

Other activities and conditions for the 2024 annual reporting period include:

- Semiannual Assessment-mode groundwater monitoring events were conducted in June and September. Monitoring involved sampling of background monitoring wells and downgradient monitoring wells.
- MW-53B was plugged and abandoned (due to screen failure/siltation) and replaced with MW-53BR (immediately adjacent to prior well).
- No program transitions (Detection to Assessment or vice versa) were triggered.
- The LRS CCR Groundwater Monitoring System Report, Revision 1 was drafted (finalized in January 2025).

Anticipated activities for the next annual reporting period include:

- Completion of two semi-annual Assessment-mode groundwater monitoring events.
- Statistical evaluation of groundwater data for Appendix III and Appendix IV constituents.
- Performance monitoring of the selected remedy.

1 Introduction

On behalf of Basin Electric Power Cooperative (Basin), AECOM Technical Services, Inc. (AECOM) has prepared this 2024 annual report documenting groundwater monitoring and corrective action for the coal combustion residuals (CCR) units at Basin's Laramie River Station (LRS).

Section 1 provides background information on the LRS power generating facility, its CCR unit(s) and their physical setting, including geology, hydrology, and groundwater conditions. Section 2 summarizes CCR groundwater monitoring activities conducted prior to 2024. Section 3 summarizes the groundwater monitoring and corrective action activities completed in 2024, and references attachments to this report that contain detailed documentation of those activities. Section 4 provides some general information regarding the LRS CCR program and actions planned for 2025. Section 5 presents a summary and conclusions from CCR groundwater monitoring in 2024 and statistical analysis of the results. Section 6 lists references cited in this report.

1.1 Regulatory Background

The CCR rule (Chapter 40 of the Code of Federal Regulations [CFR] Part 257 Subpart D) became effective on October 19, 2015 and 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), with the annual report for 2024 due by January 31, 2025. 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 eighth annual report for LRS and reports on activities performed and data gathered in calendar year 2024.

1.2 Facility Location and Operational History

LRS, located east of Wheatland, Wyoming (**Figure 1**), is one of the largest consumer-operated, regional, joint power supply ventures in the United States (U.S.). The plant consists of three power-generating units with a total power output capacity of 1,710 megawatts:

- Unit 1, with a rating of 570 megawatts, which began operating in 1980;
- Unit 2, with a rating of 570 net megawatts, which began operating in 1981; and
- Unit 3, with a rating of 570 net megawatts, which began operating in 1982.

CCR produced at LRS includes fly ash, bottom ash, and flue gas desulfurization waste.

1.3 CCR Unit Description

CCR is disposed at LRS in the following CCR units, monitored as individual units or multi-units:

- Bottom Ash Pond 1;
- Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill (multi-unit); and
- Emergency Holding Ponds (multi-unit).

The Ash Landfill and three bottom ash ponds are located near the western edge of the site, west of the LRS generating units and office complex (**Figure 2**). The two emergency holding ponds are located north of the generating units in the northeastern part of the site. The landfill and ash ponds were permitted in 1978 and began receiving coal ash in 1980. The emergency holding ponds were identified as CCR units due to periodic disposal of flue gas desulfurization waste in the ponds.

1.4 Physical Setting

The geological and hydrogeological setting is important to understanding the groundwater environment in the vicinity of the LRS. The geologic history of Platte County, Wyoming is similar to most areas within the Front Range of the Rocky Mountains. Platte County is underlain by marine and continental deposits of limestone, conglomerate, sandstone, siltstone, shale, and unconsolidated sediments. Deposits range in thickness up to 10,000 feet (ft) in the east central and southeastern parts of the county. Precambrian rocks generally make up the mountainous areas, Paleozoic and Mesozoic rocks adjoin the older formations, and Tertiary and Quaternary period rocks underlie most of the county east of the Laramie Range (U.S. Geological Survey [USGS] 1960). The Laramide Orogeny was a period of mountain building active in the county approximately 70 million years ago marking the beginning of the Laramie Range and the Hartville Uplift, a structural divide separating the southern Powder River Basin from the northern Denver Basin. During the Cenozoic Era, streams eroded the eastern side of the range depositing silts, sands, and gravels of the Brule and Arikaree Formations that underlie the Wheatland area, including LRS.

Precipitation landing on the eastern flank of the Laramie Range supplies surface water to perennial and ephemeral streams that flow east towards the basin. Most surface water west of Wheatland eventually joins with the Laramie River, continuing east before discharging into the Platte River near Fort Laramie. Groundwater near Wheatland is recharged primarily through infiltration of rain and melt water on the eastern flank of the Laramie Range and through infiltration of irrigation water during the spring, summer, and fall months. Some groundwater in the saturated zones eventually returns to the land surface through seeps and springs, or is discharged by wells and evapotranspiration; however, the majority flows into surface streams. Alluvial drainages bounding the eastern (Wheatland Creek) and western portions (Chugwater Creek) of the facility generally transport surface water northward, discharging to the Laramie River (USGS 1960). Some groundwater within these regions percolates into the Arikaree Formation, which holds the uppermost aquifer beneath the LRS facility.

The LRS facility is underlain by a 5 to 30 ft thick section of Quaternary sediments that overlie the Arikaree Formation. The Arikaree Formation is comprised primarily of loosely to moderately cemented very-fine to fine-grained sandstone with interbedded silts and clays. A lower unit consists of lenses of loose- to well-cemented, red to gray coarse sandstone interbedded with lenses of well-cemented conglomerate. A basal conglomerate lies unconformably upon the underlying Brule Formation in many places throughout Platte County (USGS 1960). A review of the geologic logs generated during the drilling of the on-site water supply well (Forell-Baumgardner No. 2) suggests the Brule Formation is approximately 820 ft below ground surface (bgs) in the western portions of the facility. Based on this information, the local thickness of the Arikaree Formation on-site is approximately 790 ft thick.

The lithologic characteristics of the Arikaree Formation beneath the LRS are generally consistent, although there are slight differences in the degree of cementation and in duration, and minor variations in grain size. Few fractures were noted in borehole soil cores obtained during monitoring well network installation. Interbeds with higher silt and clay content, coupled with greater cementation, generate thin discontinuous perched groundwater horizons that are interpreted to hold only seasonal groundwater. The perched groundwater would tend to percolate downward to what is interpreted as the uppermost aquifer based on data obtained during monitoring well installation and aquifer testing. The uppermost aquifer is present at a depth of approximately 95 ft bgs in the southwestern portion of the facility, and slopes generally north towards the Laramie River. The hydraulic gradient for the uppermost aquifer beneath the facility appears to be controlled dominantly through topographic features and enhanced infiltration zones in permeable shallow alluvium. A representative potentiometric surface map from the most recent Assessment monitoring event conducted in September 2024 is presented in **Attachment A**. Data from aquifer pumping tests conducted at the facility in 2016 were used to estimate hydraulic conductivities, which range from 0.65 ft per day (ft/day) to 3.12 ft/day, with an average of 1.40 ft/day. Aquifer slug tests were also performed on eight other wells, with resulting hydraulic conductivities ranging from 0.45 ft/day to 6.28 ft/day, with an average of 2.16 ft/day.

2 CCR Groundwater Monitoring Activities Prior to 2024

The regulatory process for CCR groundwater monitoring and corrective action is established by 40 CFR § 257.90 through 257.98. The process includes a phased approach to groundwater monitoring, 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 corrective action assessment, followed by corrective action implementation.

The following paragraphs provide a summary of CCR groundwater monitoring activities performed prior to 2024. CCR groundwater monitoring activities performed in 2024 are discussed in Section 3.

Groundwater monitoring at LRS 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 CCR units (**Figure 2**). The hydro stratigraphic positions of the CCR monitoring wells selected for sampling background and downgradient groundwater quality for each LRS CCR unit or multi-unit prior to 2024 are summarized below:

CCR Unit/multi-Unit	Background Wells	Downgradient Wells
Bottom Ash Pond 1	MW-52B, MW-53BR	MW-49B, MW-21B, MW-38B, MW-38C
Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill	MW-39B, MW-32B	MW-36B, MW-37B, MW-20B, MW-14BR, MW-40B, MW-52B, MW-53BR
Emergency Holding Ponds	MW-41B, MW-42B, MW-43B	MW-44B, MW-45B, MW-46B, MW-47B

The following monitoring wells were also included in the CCR monitoring network for the purpose of measuring groundwater elevations and evaluating groundwater flow direction and velocity in the vicinity of the bottom ash ponds and landfill: MW-33B, MW-34B, MW-35B, MW-48B, MW-50B, MW-51B, MW-54B, MW-55B, and MW-56B.

2.1 Baseline Detection Monitoring (2016-17)

Detection monitoring was initiated in August 2016, which involved sampling groundwater for Part 257 Appendix III and Appendix IV constituents over eight baseline Detection monitoring events.

Baseline Detection monitoring events were performed in general accordance with procedures established in the site-specific Sampling and Analysis Plan (AECOM 2018a), which is included in the facility's Operating Record. The Sampling and Analysis Plan 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 detection monitoring at LRS were presented and discussed in the First Annual Groundwater Monitoring and Corrective Action Report, 2016-2017 (AECOM 2018b).

2.2 Initial Assessment Monitoring (2018)

If a statistically significant increase (SSI) of any Appendix III constituent relative to background conditions was detected in the downgradient monitoring wells and could not be demonstrated to be associated with a source other than the CCR unit, then the CCR rule required that groundwater monitoring transition from the Detection monitoring phase to the Assessment monitoring phase. The results of the Baseline Detection monitoring (2016–2017) identified the following Appendix III SSIs:

- Bottom Ash Pond 1 SSIs – boron, calcium, chloride, sulfate, and total dissolved solids (TDS);
- Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill SSIs – fluoride and chloride; and

- Emergency Holding Ponds SSI – fluoride.

In response to SSIs identified during Detection monitoring, Basin implemented an Assessment monitoring program for the two CCR multi-units (Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill and Emergency Holding Ponds) in the spring of 2018. The initial Assessment monitoring event for the two multi-units was conducted in April 2018 and included analysis of groundwater samples for constituents listed in Part 257 Appendix IV. Also in the spring of 2018, Basin elected to conduct an alternative source demonstration (ASD) investigation to evaluate whether an alternative source could explain the SSIs identified for Bottom Ash Pond 1 during Detection monitoring. This ASD investigation involved the following activities:

- Analyzing soil samples collected from shallow soil borings at 10 locations near Bottom Ash Pond 1; and
- Performing groundwater modeling to evaluate potential constituent migration pathways and transport times from potential source areas to one of the downgradient wells for Bottom Ash Pond 1.

The ASD investigation could not confirm an alternative source; therefore, Basin initiated an Assessment monitoring program for Bottom Ash Pond 1 and completed the initial Assessment monitoring event in June 2018, which included analysis of groundwater samples for constituents listed in Part 257 Appendix IV.

The following Appendix IV constituents were detected during the initial Assessment monitoring of the CCR multi-units: barium, chromium, fluoride, lithium, molybdenum, radium-226 and -228 (combined), and selenium (April 2018). The Appendix IV constituents detected during initial Assessment monitoring of Bottom Ash Pond 1 included barium, chromium, cobalt, fluoride, lithium, molybdenum, and selenium (June 2018).

Because one or more Appendix IV constituents were detected during the initial Assessment monitoring events for all three CCR units/multi-units at LRS, the CCR rule required that a second verification Assessment monitoring event be performed for each unit/multi-unit. Verification Assessment monitoring was performed in June 2018 for the two multi-units and in October 2018 for Bottom Ash Pond 1. Verification monitoring for each unit/multi-unit involved analysis for Appendix III constituents plus the Appendix IV constituents detected during initial Assessment monitoring.

The results of Assessment monitoring conducted in 2018 were presented in the 2018 Annual Groundwater Monitoring and Corrective Action Report (AECOM 2019a).

2.3 Additional Groundwater Characterization (2019)

The CCR rule requires that concentrations of Appendix III and Appendix IV constituents detected in downgradient wells during Assessment monitoring be compared to background concentrations using the statistical procedures in 40 CFR § 257.93(g). The rule also requires the establishment of GWPSs in accordance with 40 CFR § 257.95(h) for each Appendix IV constituent detected in downgradient wells during Assessment monitoring. If a GWPS is exceeded in one or more downgradient wells at statistically significant levels (SSLs), the rule requires additional groundwater characterization and an ACM, unless the SSLs can be attributed to a source other than the CCR unit or to an error in sampling, statistical evaluation, or natural variation in groundwater quality.

Assessment monitoring of Bottom Ash Pond 1 found that lithium and molybdenum concentrations in monitoring well MW-38B exceeded GWPSs at SSLs. Although selenium concentrations in monitoring wells MW-21B and MW-38B exceeded the GWPS by direct comparison, their 95 percent lower confidence limit (95% LCL) did not exceed the GWPS. Basin concluded the available data indicated that the SSLs associated with Bottom Ash Pond 1 could not be attributed to a source other than the CCR unit or to errors in sampling, statistical evaluation, or natural variation in groundwater quality. Therefore, Basin performed additional groundwater characterization and an ACM for Bottom Ash Pond 1. Additional groundwater characterization activities were performed in the spring of 2019 to evaluate the nature and extent of groundwater impacted by a release of CCR from Bottom Ash Pond 1 that has resulted in the exceedance of GWPSs for lithium and molybdenum. The characterization activities were designed to also support selection and implementation of a remedy to attain GWPSs. The activities involved installation and sampling of four monitoring wells (MW-38C, MW-54B, MW-55B, MW-56B) downgradient of Bottom Ash Pond 1 at the locations illustrated in **Figure 2**:

- MW-38C was installed near MW-38B to evaluate the vertical extent of groundwater impacts near MW-38B. The total depth of MW-38C was 130 ft bgs.
- MW-54B was installed to evaluate groundwater quality of the uppermost aquifer at the facility boundary. The total depth of MW-54B was 25 ft bgs.
- MW-55B was installed northeast of MW-21B to evaluate the downgradient extent of groundwater impacts north of MW-38B. The total depth of MW-55B was 70 ft bgs.
- MW-56B was installed east of MW-21B to evaluate the lateral extent of groundwater impacts northeast of MW-38B. The total depth of MW-56B was 79 ft bgs.

Groundwater samples from the four wells were analyzed for Appendix III parameters and the following Appendix IV parameters: barium, chromium, cobalt, fluoride, lithium, molybdenum, and selenium; and the geochemical parameters alkalinity, magnesium, and sodium. None of the 2019 results exceeded the GWPSs for lithium, molybdenum, or the other Appendix IV constituents detected during Assessment monitoring in 2018. These results, combined with results from past Assessment monitoring, reasonably defined the extent of groundwater impacted by lithium and molybdenum attributed to Bottom Ash Pond 1. The data suggest that the horizontal extent of groundwater with lithium and molybdenum concentrations exceeding GWPSs extends from Bottom Ash Pond 1 downgradient to MW-38B, but not as far as MW-55B or MW-56B. Similarly, the vertical extent of groundwater exceeding GWPSs extends from the surface of the uppermost aquifer at MW-38B to possibly below the bottom of the screened interval of MW-38B (75 ft bgs), but not as deep as the screened interval of MW-38C (114 ft bgs to 125 ft bgs). Overall, the data enhanced understanding of relevant site conditions, assisted in selecting a remedy, and will be useful for remedy design and implementation.

2.4 Assessment of Corrective Measures (ACM) (2019-2020)

Groundwater Assessment monitoring of Bottom Ash Pond 1 identified lithium and molybdenum at SSLs above GWPSs. The exceedance of GWPSs triggered requirements for the assessment, selection, and implementation of corrective measures to prevent further releases of hazardous constituents, remediate any releases, and restore the affected area. Basin completed an ACM in 2019 (AECOM 2019b). The ACM focused on identifying and evaluating groundwater corrective measures to address the dissolved lithium and molybdenum in groundwater downgradient of Bottom Ash Pond 1.

Potentially applicable corrective measures were identified based on the nature and extent of groundwater impacts and site-specific geological and hydrogeological characteristics. Screening was performed by evaluating each corrective measure against the criteria of effectiveness, technical implementability, and relative cost. Those that were deemed ineffective and/or had significant implementation concerns were rejected from further consideration. Natural attenuation, groundwater extraction, and long-term monitoring passed the screening step and were assembled into the following two corrective measures alternatives for further detailed evaluation:

- Alternative A: Natural Attenuation and Long-Term Monitoring; and
- Alternative B: Groundwater Extraction, On-site Reuse or Disposal, and Long-Term Monitoring.

The two alternatives were evaluated against the requirements specified in 40 CFR § 257.96 and § 257.97, broadly categorized under the criterion of effectiveness, implementability, and cost. The results of the ACMs, including an evaluation of the two alternatives, are presented in the ACMs (AECOM 2019b). The two alternatives were presented at a public meeting held on January 30, 2020 in Wheatland, Wyoming. A 30-day public comment period started on January 30, 2020 and ended on February 29, 2020. No comments were received during the 30-day period following the public meeting.

2.5 Selection of Remedy and Remedy Implementation (2020-2021)

Following the ACM public meeting, Basin elected to implement Alternative B: Retrofit of Bottom Ash Pond 1, Groundwater Extraction, On-site Reuse or Disposal, and Long-Term Monitoring to meet the remedy requirements of the CCR rule. The Groundwater Remedy Selection Report was certified and issued in July 2020 (AECOM 2020). Basin

subsequently initiated remedial design activities within 90 days of remedy selection in accordance with 40 CFR § 257.97.

- The first step in the selected alternative involves the removal of all CCR from Bottom Ash Pond 1 and the placement of a liner system before returning it to service as a CCR unit. The retrofit was initiated in August 2020 and completed in March 2021.
- The second step involves the use of proven, reliable groundwater pumping technology to intercept impacted groundwater and route it back to the retrofitted Bottom Ash Pond 1. Design of this step was initiated in November 2020 and was completed in spring 2022. The following steps were completed in 2021:
  - Installation of two 6-inch recovery wells to a total depth of approximately 80 ft bgs occurred in November 2021.
  - Recovery well development and aquifer testing of the recovery wells occurred in December 2021.

2.6 Semi-annual Assessment Monitoring (2019-2023)

Assessment monitoring in 2018 of the Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill multi-unit found that concentrations of Appendix IV constituents chromium, fluoride, and selenium exhibited SSIs above background values, but all concentrations were below GWPSs. Therefore, Assessment monitoring of this multi-unit is required on a semi-annual basis per the requirements of 40 CFR § 257.95. Assessment monitoring of the Emergency Holding Ponds multi-unit found that Appendix IV constituents chromium, fluoride, and selenium exhibited SSIs above background values but below GWPSs. Therefore, semi-annual Assessment monitoring of this multi-unit is also required. The results of semi-annual Assessment monitoring subsequently completed in 2024 are discussed in Section 3.

The first of two semi-annual Assessment monitoring events for 2019 occurred on June 4-6, 2019. The field activities and resulting data were summarized in the Sampling and Analysis Report, Assessment Monitoring, June 2019 (AECOM 2019c). The second semi-annual Assessment monitoring event for 2019 occurred on October 21-23, 2019. The field activities and data were summarized in the Sampling and Analysis Report, Assessment Monitoring, October 2019 (AECOM 2019d).

Semi-annual Assessment monitoring events for 2020, 2021, 2022, and 2023 occurred in June and October of each year. The field activities and resulting data were summarized in the 2020 Annual Groundwater Monitoring and Corrective Action Report, the 2021 Annual Groundwater Monitoring Corrective Action Report, the 2022 Annual Groundwater Monitoring Corrective Action Report, and the 2023 Annual Groundwater Monitoring Corrective Action Report (AECOM 2021, 2022, 2023,2024).

3 CCR Groundwater Monitoring and Corrective Action Activities in 2024

This section summarizes the activities conducted at LRS in 2024 to comply with the groundwater requirements of the CCR rule:

- Groundwater Assessment monitoring activities for all CCR units:
  - monitoring system evaluation;
  - groundwater sampling;
  - laboratory analysis; and
  - statistical analysis of the monitoring results.
- Replacement of monitoring well MW-53B with MW-53BR (immediately adjacent to prior well) and subsequent plugging and abandonment of MW-53B.
- Surface completion modifications (extending up) for monitoring wells MW-50B, MW-51B, MW-52B.
- Update of the CCR Groundwater Monitoring System Report to include replacement monitoring well MW-53BR and updated top of casing elevation information for monitoring wells with modified surface completions.
- Groundwater Corrective Action
  - A Groundwater Extraction System was designed for Bottom Ash Pond 1, was partially installed in 2023, final installation was completed in July 2024, and operation began on July 24, 2024.

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

3.1 Assessment Monitoring Activities

3.1.1 Monitoring System Evaluation

As described in the CCR Groundwater Monitoring System Report (AECOM 2017), monitoring wells were installed around the CCR unit/multi-units at LRS 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 LRS CCR monitoring system with the exception of well MW-53B, which was abandoned and replaced with MW-53BR, were found to be in good condition during the assessment monitoring events conducted in 2024. Surface completions for monitoring wells MW-50B, MW-51B, and MW-52B were also modified by removing the concrete flush mount completion, adding a segment to the polyvinyl chloride riser pipe, and installing a new flush mount surface competition. This work was done to bring the monitoring well surface completion up to be flush with the grade of the road that was raised during Pond 3 retrofit activities. The CCR Groundwater Monitoring System Report (Revision 1) for the site was updated to include the well network updates with MW-53BR, MW-50B, MW-51B, and MW-52B. Updates to the system report were made in 2024 and the report was finalized and posted to the public record in January 2025.

Following additional groundwater characterization of Bottom Ash Pond 1 in the spring of 2019, Basin elected to incorporate the four newly installed monitoring wells (MW-38C, MW-54B, MW-55B, and MW-56B) into the Assessment monitoring program, which continued into 2024. Water level measurements and groundwater quality samples were collected from MW-38C during the June and September 2024 Assessment monitoring events. Water level measurements were only taken at MW-54B, MW-55B, and MW-56B in 2024.

Potentiometric surface maps constructed using the depth-to-groundwater measurements obtained at the beginning of each event are presented in **Attachment A**. The direction of groundwater flow in both 2024 events is generally to the

northeast, consistent with previous data collected during detection and assessment monitoring from 2016 through 2023, and supports the design of the well network (**Figure 2**) to monitor background groundwater quality and the quality of groundwater downgradient of the CCR units.

3.1.2 Groundwater Sampling and Analysis

Groundwater Assessment monitoring was performed at LRS in June and September 2024 for the three CCR unit/multi-units. Monitoring activities included collecting groundwater samples from the wells listed below:

CCR Unit/Multi-unit	Background Wells	Downgradient Wells
Bottom Ash Pond 1	MW-52B, MW-53BR	MW-21B, MW-38B, MW-38C*, MW-49B
Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill (multi-unit)	MW-39B, MW-32B	MW-36B, MW-37B, MW-20B, MW-14BR, MW-40B, MW-52B, MW-53BR
Emergency Holding Ponds (multi-unit)	MW-41B, MW-42B, MW-43B	MW-44B, MW-45B, MW-46B, MW-47B

* MW-38C, installed in April 2019, was added to the assessment monitoring program as a downgradient compliance well for Bottom Ash Pond 1.

Water levels were also measured in the following monitoring wells for the purpose of evaluating groundwater flow direction and velocity:

- MW-33B, MW-34B, MW-35B, MW-48B, MW-50B, MW-51B, MW-54B, MW-55B, and MW-56B. Assessment monitoring sampling and analysis was performed in general accordance with procedures established in the Sampling and Analysis Plan (AECOM 2018a). The results are presented in **Attachment A**, which also includes representative potentiometric surface maps for the uppermost aquifer, inferred groundwater flow directions and estimated velocities, and a tabulated summary of field measurements and laboratory analytical data.

3.2 Statistical Procedures and Analysis

The CCR rule requires that concentrations of Appendix III and Appendix IV constituents detected in downgradient wells during Assessment monitoring be compared to background concentrations using the statistical procedures in 40 CFR § 257.93(g). The rule also requires the establishment of GWPSs for each Appendix IV constituent detected in downgradient wells during Assessment monitoring. The detected concentrations are then compared to the GWPSs for each constituent, which are either:

- The federal Safe Drinking Water Act maximum contaminant level;
- Concentrations for cobalt, lead, lithium, and molybdenum specified in 40 CFR § 257.95(h)(2); or
- The background concentration (upper prediction limit [UPL]) if it is higher than the maximum contaminant level or concentration specified in 40 CFR § 257.95(h)(2).

The statistical analysis procedures and results from 2024 Assessment monitoring for each LRS CCR unit/multi-unit are discussed below. Input and output data files for calculating the UPLs and lower prediction limits for the LRS multi-units are provided in **Attachment B**.

3.3 Bottom Ash Pond 1

Appendix III and Appendix IV groundwater quality data from Bottom Ash Pond 1 Assessment monitoring were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at background monitoring wells. The statistical analyses were performed in accordance with the Statistical Method Certification and Statistical Methodology presented in the CCR Groundwater Monitoring System Report (AECOM 2017).

Prediction limits (i.e., parametric or nonparametric) were developed for each constituent based on the frequency of non-detect values and whether the background data for that constituent exhibited a normal, lognormal, or nonparametric distribution. For the statistical analysis, non-detect values were represented as one-half the detection limit. No outliers were identified in the background data. Analytical data from the background monitoring wells were used to develop an UPL for the Appendix III and Appendix IV background data at 95% confidence or better. Data from each downgradient compliance monitoring well were compared to the UPL to identify SSIs over background. Mann-Kendall trend analysis was used to identify trends for constituents with SSIs. Constituents exhibiting an SSI over the background UPL were further evaluated to determine whether they are present at SSLs relative to GWPS established under 40 CFR § 257.95(d)(2). SSLs were identified by calculating the 95% LCL for the constituents exhibiting SSIs over background at the downgradient compliance wells at each CCR unit and comparing the 95% LCL to the established GWPS. A constituent is present at an SSL above the GWPS if the 95% LCL is greater than the GWPS.

Table 1 summarizes the statistically determined background UPLs of each Appendix III and Appendix IV constituent for Bottom Ash Pond 1. **Table 1** also identifies applicable Appendix IV GWPSs, whether each Appendix IV constituent concentration measured in the downgradient wells exceeds the GWPS by direct comparison, and if constituent concentrations are present at an SSL above the GWPS. Assessment monitoring of Bottom Ash Pond 1 in 2024 found that lithium and molybdenum at monitoring well MW-38B exceeded their respective GWPSs at an SSL. Appendix IV SSIs were also observed in MW-21B for lithium, molybdenum, and selenium, and in monitoring well MW-38B for chromium. In these instances, the SSIs did not exceed the GWPS at an SSL because the 95% LCL did not exceed the GWPS. Assessment monitoring of this CCR unit will continue on a semi-annual basis per the requirements of 40 CFR § 257.95.

3.4 Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill Multi-unit

Statistical analyses of Appendix III and Appendix IV groundwater quality data for the Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill multi-unit were performed in a manner similar to that described above for Bottom Ash Pond 1. **Table 2** summarizes the statistically determined background UPLs of each Appendix III and Appendix IV constituent for the Bottom Ash Pond 2/Bottom Ash Pond 3/Ash Landfill multi-unit. **Table 2** also identifies applicable Appendix IV GWPSs, whether each Appendix IV constituent concentration measured in the downgradient wells exceeds a GWPS by direct comparison, and if the constituent concentrations are present at an SSL above the GWPS. Assessment monitoring of this multi-unit in 2024, found that concentrations of some Appendix IV constituents (arsenic, barium, chromium, cobalt, fluoride, lead, molybdenum, radium 226/228, and selenium) exhibited SSIs relative to background values at select monitoring wells, but each SSI concentration was below its respective GWPS. Assessment monitoring of this multi-unit will continue on a semi-annual basis per the requirements of 40 CFR § 257.95.

3.5 Emergency Holding Ponds

Statistical analyses of Appendix III and Appendix IV groundwater quality data for the Emergency Holding Ponds multi-unit were also performed consistent with the methodology described above for Bottom Ash Pond 1. **Table 3** summarizes the statistically determined background UPLs of each Appendix III and IV constituent for the Emergency Holding Ponds multi-unit. **Table 3** also identifies applicable Appendix IV GWPSs, whether each Appendix IV constituent concentration measured in the downgradient wells exceeds a GWPS by direct comparison, and if the constituent concentrations are present at an SSL above the GWPS. Assessment monitoring of the Emergency Holding Ponds multi-unit in 2024 found that concentrations of three Appendix IV constituents (barium, chromium, and fluoride) exhibited one or more SSIs above the background value at select monitoring wells. No Appendix IV constituent concentrations exceeded the respective GWPSs. Assessment monitoring of this multi-unit will continue on a semi-annual basis per the requirements of 40 CFR § 257.95.

3.6 Corrective Action Activities

3.6.1 Selection of Remedy for Bottom Ash Pond 1

After completion of the Bottom Ash Pond 1 excavation and retrofit, and the installation of the groundwater interceptor system extraction wells in 2021, the design of the groundwater recovery pumping system was conducted. The design

included elements of pumping, piping, electrical service, and process controls. The design was completed in 2022 and the contracting for installation of these elements was initiated in 2022. The system was partially installed in 2023 and completed in 2024, with system startup of both recovery wells in July 2024 for continual groundwater extraction.

4 General Information

The following subsections summarize any problems encountered in the LRS CCR program in 2024, resolutions to those problems (if needed), and upcoming actions planned for 2025.

4.1 Problems Encountered and Corrective Actions

Recovery well system startup was initially planned for March 2024, but was delayed when the system had to be shut down after initial testing of pumps and controls. The control panel ventilation and heating design was insufficient and required off-site modification to satisfy American National Standards Institute certification requirements. A faulty flow meter was also discovered during system testing that needed to be replaced for one of the recovery wells. Once these issues were resolved, the system was put into full-time operation in July 2024. RW-1 was set to a flow rate of seven gallons per minute and RW-2 was set to four gallons per minute. After a short time of operation, the RW-1 flow rate was set to four gallons per minute to allow for efficient system operation. Well pumping continued throughout the end of 2024.

Monitoring well MW-53B was replaced in April 2024 with monitoring well MW-53BR. The original MW-53B well was found to have a compromised screen that had allowed it to be filled with silt. In April 2024, the well was decommissioned by filling with bentonite grout and removal of the surface completion. The replacement well, MW-53BR, was drilled approximately 10-15 ft away from the original well. MW-53BR was drilled to a depth of 120 ft bgs and completed to match the original specifications of MW-53B. All work was performed by a licensed well driller. Data will be evaluated in 2025 comparing sampling results from MW-53BR to the original MW-53B from 2024, and earlier to determine if data similarity demonstrates a viable well replacement.

Monitoring wells MW-50B, MW-51B, and MW-52B adjacent to Ash Pond 3 also underwent upgrades in April 2024 by removing the original flush-mount surface completion, raising the well riser height to match the surrounding road grade, and installing new flush-mount surface completion. This work was done as the road grade surrounding Ash Pond 3 was raised during retrofit activities and the monitoring wells needed to be brought up to match the new grade. There are no issues with these wells that would impact their operation or sample recovery.

No other problems were encountered in 2024.

4.2 Actions Planned for 2025

Basin plans to continue the Assessment monitoring program for the three CCR unit/multi-unit monitoring systems at LRS in 2025. The Assessment monitoring program will include semi-annual groundwater sampling events and the required statistical evaluations. Performance monitoring samples are planned to be collected from RW-1 and RW-2 to help evaluate the performance and operation of the system.

In addition, Basin intends to install new dedicated submersible sampling pumps in MW-52B and MW-53BR. The original sampling pumps for these two wells have been removed due to poor performance (but were still operational).

5 Summary and Conclusions

Two rounds of groundwater Assessment monitoring were performed at LRS in 2024. Statistical analysis of the results identified an SSI for at least one Appendix III constituent for each LRS CCR unit/multi-units. Therefore, Assessment monitoring will be performed on a semi-annual basis in 2025 for all LRS CCR unit/multi-units. Basin will monitor the selected remedy implemented in 2024 to address Appendix IV SSLs for lithium and molybdenum associated with Bottom Ash Pond 1 and continue to comply with CCR rule notification, reporting, and certification requirements.

6 References

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Figures

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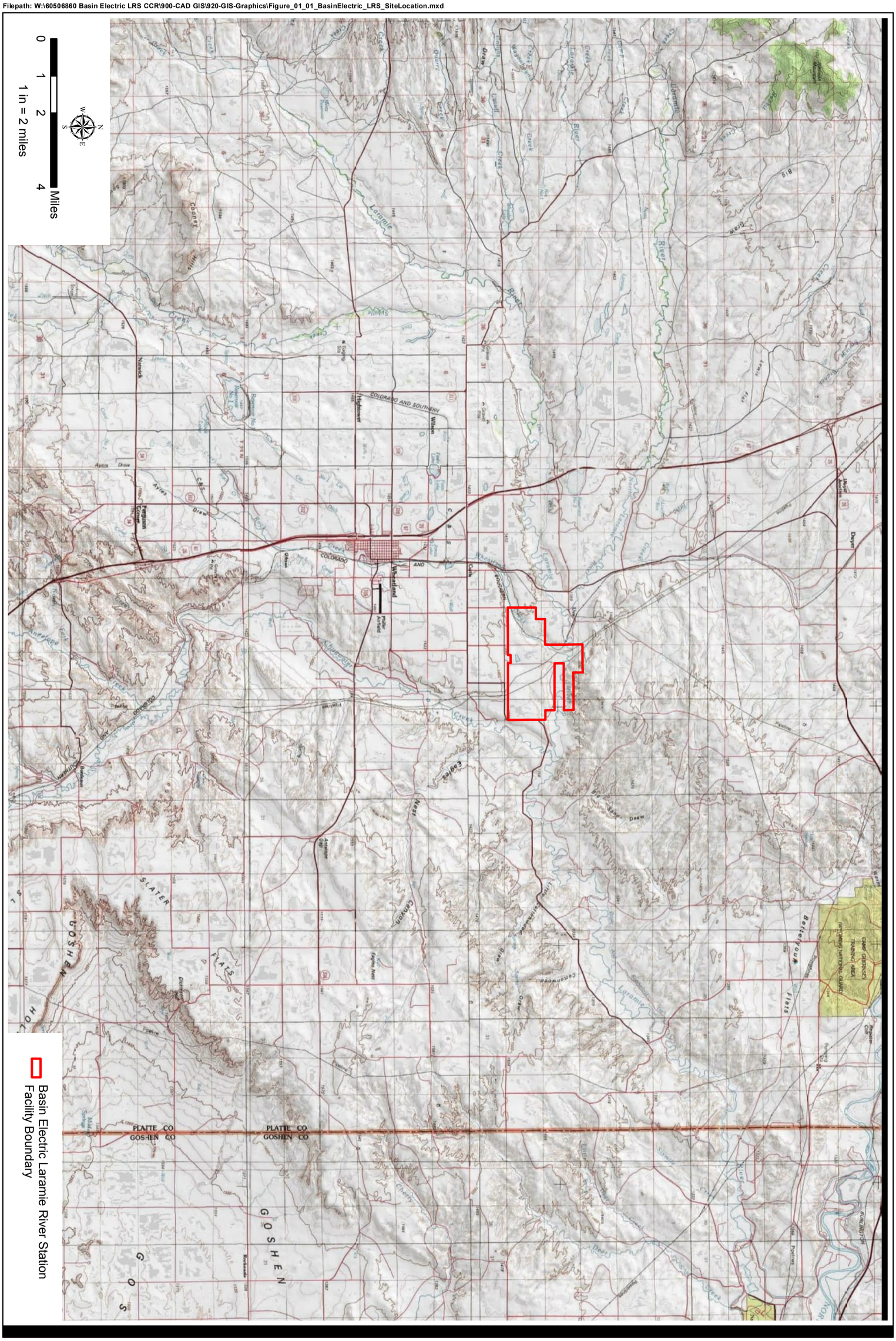

Basin Electric
Laramie River Station
Platte County, Wyoming
Project No.: 60732883 Date: 12302024

Site Location Map

AECOM

Figure: 1

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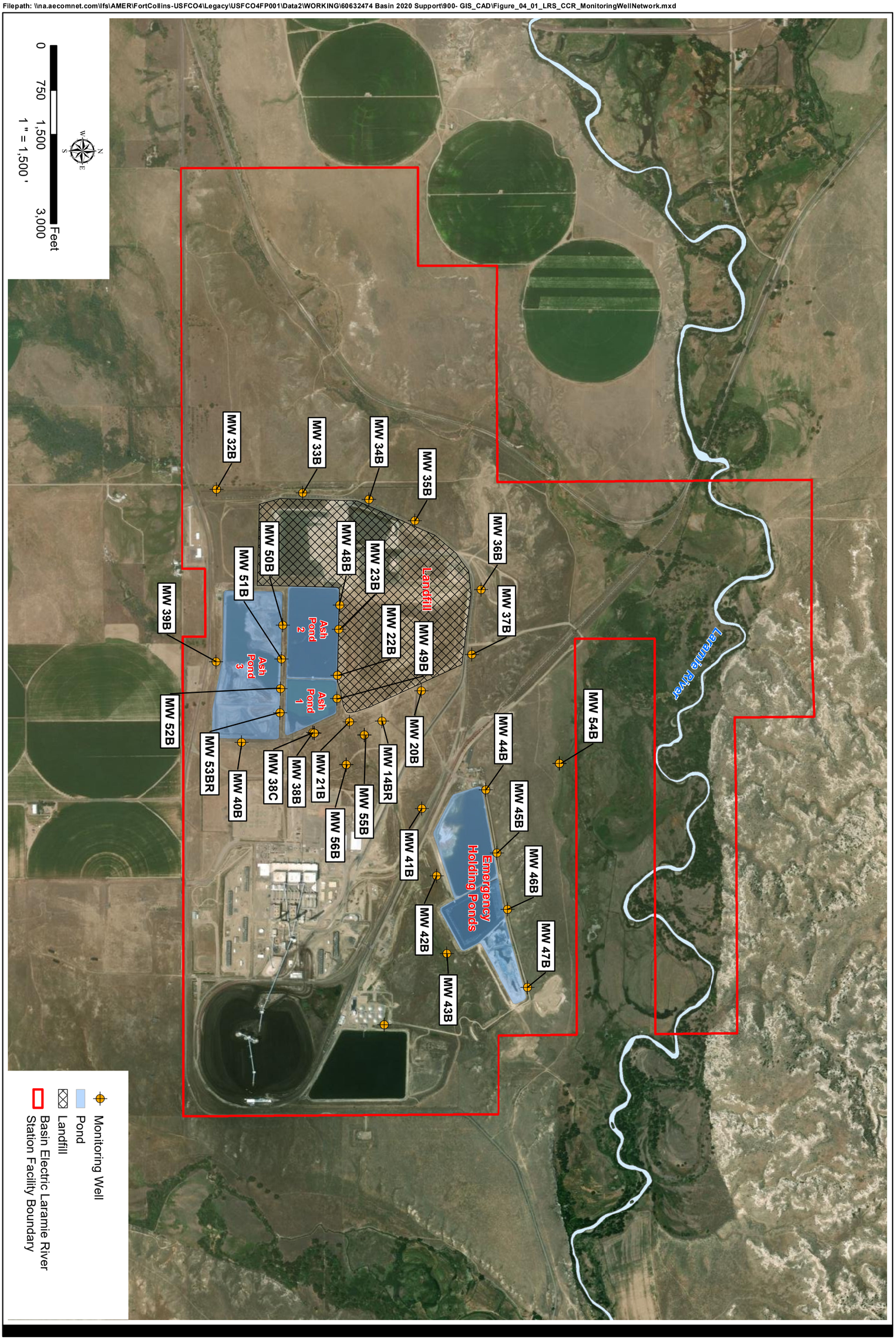

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Platte County, Wyoming
Project No.: 60732883 Date: 12/30/2024

LRS CCR Monitoring Well Network

AECOM

Figure: 2

Tables

Table 1. Statistical Analysis Methods and Results - Bottom Ash Pond 1 2024

Parameter (units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background UPL	GWPS Basis	GWPS	SSI Above Background?	Exceeds GWPS?	SSL Above GWPS?
Appendix III										
Boron (mg/L)	73	15	No/No	Nonparametric	0.179	----	----	Yes (MW-21B, MW-38B, MW-49B)	----	----
Calcium (mg/L)	73	0	No/Yes	Parametric	189.3	----	----	Yes (MW-21B, MW-38B)	----	----
Chloride (mg/L)	73	0	Yes/Yes	Parametric	49.9	----	----	Yes (MW-21B, MW-38B)	----	----
Fluoride (mg/L)	76	33	Yes/No	Parametric	1.327	----	----	No	----	----
pH (std units)	81	0	No/No	Nonparametric	6.94/8.837	----	----	No	----	----
Sulfate (mg/L)	73	0	No/No	Nonparametric	647.4	----	----	Yes (MW-21B, MW-38B)	----	----
TDS (mg/L)	74	0	No/No	Nonparametric	1,403	----	----	Yes (MW-21B, MW-38B)	----	----
Appendix IV										
Antimony (mg/L)	69	100	No/No	MDL	0.002	§257.95(h)(3)	0.006	No	----	----
Arsenic (mg/L)	69	91	No/No	MDL	0.005		0.05	No	----	----
Barium (mg/L)	76	0	Yes/Yes	Parametric	0.155		2	No	----	----
Beryllium (mg/L)	69	99	No/No	MDL	0.001		0.004	No	----	----
Cadmium (mg/L)	69	99	No/No	MDL	0.001		0.005	No	----	----
Chromium (mg/L)	76	29	Yes/Yes	Parametric	0.00583		0.1	Yes (MW-38B)	----	----
Cobalt (mg/L)	76	86	No/No	Nonparametric	0.001		0.006	No	----	----
Fluoride (mg/L)	76	33	No/No	Nonparametric	1.33		4	No	----	----
Lead (mg/L)	69	93	No/No	MDL	0.004		0.015	No	----	----
Lithium (mg/L)	76	4	Yes/Yes	Parametric	0.0532		0.0532 (0.04)	Yes (MW-21B, MW-38B)	Yes (MW-21B, MW-38B)	Yes (MW-38B)
Mercury (mg/L)	69	100	No/No	MDL	0.0002		0.002	No	----	----
Molybdenum (mg/L)	76	13	Yes/Yes	Parametric	0.014		0.1	Yes (MW-21B, MW-38B)	Yes (MW-38B)	Yes (MW-38B)
Radium 226+228 (pCi/L)	69	56	Yes/Yes	Parametric	0.80		5	No	----	----
Selenium (mg/L)	76	34	Yes/Yes	Parametric	0.011		0.05	Yes (MW-21B)	No	No
Thallium (mg/L)	69	99	No/No	MDL	0.001		0.004	No	----	----

GWPS - groundwater protection standard (MCL shown in parentheses if UPL is higher)
MCL - maximum contaminant level
MDL - UPL set at maximum Method Detection Limit
mg/L - milligram per liter
pCi/L - picocuries per liter
SSI - statistically significant increase
SSL - statistically significant level (95LCL exceeds GWPS)
UPL - upper prediction limit

Table 2. Statistical Analysis Methods and Results - Ash Pond 2, Ash Pond 3, Ash Landfill Multi-unit 2024

Parameter (units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background UPL	GWPS Basis	GWPS	SSI Above Background?	Exceeds GWPS?	SSL Above GWPS?
Appendix III										
Boron (mg/L)	146	15	No/No	Nonparametric	0.311	----	----	No	----	----
Calcium (mg/L)	146	0	Yes/Yes	Parametric	208.3	----	----	Yes (MW-14BR)	----	----
Chloride (mg/L)	146	0	No/No	Nonparametric	95.56	----	----	No	----	----
Fluoride (mg/L)	153	33	No/No	Nonparametric	0.93	----	----	Yes (MW-53BR)	----	----
pH (std units)	161	0	No/No	Nonparametric	6.37/7.635	----	----	No	----	----
Sulfate (mg/L)	146	0	No/No	Nonparametric	859.4	----	----	No	----	----
TDS (mg/L)	146	0	No/No	Nonparametric	1,835	----	----	No	----	----
Appendix IV										
Antimony (mg/L)	139	100	No/No	MDL	0.002	§257.95(h)(3)	0.006	No	----	----
Arsenic (mg/L)	139	91	No/No	MDL	0.005		0.05	Yes (MW-40B)	No	No
Barium (mg/L)	153	0	No/No	Nonparametric	0.0885		2	Yes (MW-52B, MW-53BR)	No	No
Beryllium (mg/L)	139	99	No/No	MDL	0.001		0.004	No	----	----
Cadmium (mg/L)	139	99	No/No	MDL	0.001		0.005	No	----	----
Chromium (mg/L)	153	67	No/No	MDL	0.002		0.1	Yes (MW-14BR, MW-37B, MW-52B, MW-53BR)	No	No
Cobalt (mg/L)	141	92	No/No	MDL	0.001		0.006	Yes (MW-52B, MW-53BR)	No	No
Fluoride (mg/L)	153	33	No/No	Nonparametric	0.93		4	Yes (MW-53BR)	No	No
Lead (mg/L)	139	92	No/No	MDL	0.001		0.015	Yes (MW-52B, MW-53BR)	----	----
Lithium (mg/L)	153	5	Yes/Yes	Parametric	0.0848		0.04	No	----	----
Mercury (mg/L)	139	100	No/No	MDL	0.0002		0.002	No	----	----
Molybdenum (mg/L)	153	29	No/Yes	Parametric	0.0315		0.1	Yes (MW-37B)	No	No
Radium 226+228 (pCi/L)	150	58	No/Yes	Parametric	1.198		5	yes (MW-52B)	No	No
Selenium (mg/L)	153	44	No/No	MDL	0.005		0.05	Yes (MW-14BR, MW-36B, MW-37B, MW-53BR)	No	No
Thallium (mg/L)	139	98	No/No	MDL	0.001		0.004	----	----	----

GWPS - groundwater protection standard
MDL - UPL set at maximum Method Detection Limit
mg/L - milligram per liter
pCi/L - picocuries per liter
SSI - statistically significant increase
SSL - statistically significant level (95% LCL exceeds GWPS)
UPL - upper prediction limit

Table 3. Statistical Analysis Methods and Results - Emergency Holding Ponds 2024

Parameter (units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background UPL	GWPS Basis	GWPS	SSI Above Background?	Exceeds GWPS?	SSL Above GWPS?
Appendix III										
Boron (mg/L)	84	23	No/No	Nonparametric	1.26	----	----	No	----	----
Calcium (mg/L)	84	0	Yes/Yes	Parametric	446.7	----	----	No	----	----
Chloride (mg/L)	84	0	No/No	Nonparametric	320	----	----	No	----	----
Fluoride (mg/L)	88	25	Yes/Yes	Parametric	0.694	----	----	Yes (MW-45B)	----	----
pH (std units)	96	0	No/No	Nonparametric	6.45/7.9	----	----	No	----	----
Sulfate (mg/L)	84	0	No/No	Nonparametric	2,200	----	----	No	----	----
TDS (mg/L)	84	0	No/No	Nonparametric	3,900	----	----	No	----	----
Appendix IV										
Antimony (mg/L)	80	99	No/No	MDL	0.002	§257.95(h)(3)	0.006	No	----	----
Arsenic (mg/L)	80	93	No/No	MDL	0.005		0.05	No	----	----
Barium (mg/L)	88	0	No/Yes	Parametric	0.0552		2	Yes (MW-46B, MW-47B)	No	No
Beryllium (mg/L)	80	100	No/No	MDL	0.001		0.004	No	----	----
Cadmium (mg/L)	80	100	No/No	MDL	0.001		0.005	No	----	----
Chromium (mg/L)	88	30	No/Yes	Parametric	0.0063		0.1	Yes (MW-46B)	No	No
Cobalt (mg/L)	80	100	Yes/Yes	Parametric	0.00121		0.006	No	----	----
Fluoride (mg/L)	88	25	Yes/Yes	Parametric	0.694		4	Yes (MW-45B)	No	No
Lead (mg/L)	80	100	No/No	MDL	0.001		0.015	No	----	----
Lithium (mg/L)	88	5	Yes/No	Parametric	0.0809		0.04	No	----	----
Mercury (mg/L)	80	100	No/No	MDL	0.0002		0.002	No	----	----
Molybdenum (mg/L)	88	27	No/No	Nonparametric	0.177		0.1	No	----	----
Radium 226+228 (pCi/L)	84	54	Yes/Yes	Parametric	0.826		5	No	----	----
Selenium (mg/L)	88	56	Yes/Yes	Parametric	0.014		0.05	No	----	----
Thallium (mg/L)	80	100	No/No	MDL	0.001		0.004	No	----	----

GWPS - groundwater protection standard
MDL - UPL set at maximum Method Detection Limit
mg/L - milligram per liter
pCi/L - picocuries per liter
SSI - statistically significant increase
SSL - statistically significant level (95% LCL exceeds GWPS)
UPL - upper prediction limit

Attachment A

2024 Sampling and Analysis Report, CCR Monitoring Program

2024 Sampling and Analysis Report
CCR Monitoring Program

Laramie River Station
Wheatland, Wyoming

Basin Electric Power Cooperative

January 31, 2025

Prepared for:

Basin Electric Power Cooperative
Bismarck, North Dakota

Prepared by:

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Project number: 60732883

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Appendix I Groundwater Flow Calculations
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List of Acronyms

AECOM	AECOM Technical Services, Inc.
Basin	Basin Electric Power Cooperative
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
LRS	Laramie River Station
USEPA	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 Laramie River Station (LRS).

This Sampling and Analysis Report was prepared to present the results of sampling and analysis of groundwater conducted per the monitoring requirements of the United States Environmental Protection Agency (USEPA) CCR rule (Chapter 40 of the Code of Federal Regulations [CFR], §§ 257.90 to 257.98).

The following three CCR unit/multi-units are present at LRS:

- Bottom Ash Pond 1;
- Bottom Ash Pond 2, Bottom Ash Pond 3, Ash Landfill (multi-unit); and
- Emergency Holding Ponds (multi-unit).

Semi-annual groundwater Assessment monitoring was performed at LRS in June and September 2024 for the three CCR unit/multi-units. Assessment monitoring involves groundwater level measurements, collection of groundwater samples from CCR monitoring wells, and analysis for Part 257 Appendix III and selected Appendix IV parameters.

2. Groundwater Flow

As required by 40 CFR § 257.93(c), groundwater elevations were measured in each well prior to purging each time groundwater was sampled. The groundwater measurements for the 2024 Assessment monitoring events, presented in **Table 1**, were used to create potentiometric surface maps for the uppermost aquifer for each monitoring event. The resulting potentiometric surface maps (contained in the operating record) were used to evaluate the direction of groundwater flow and hydraulic gradient for each subject CCR unit/multi-unit. **Figure 1** and **Figure 2** represent a potentiometric surface map, including inferred groundwater flow direction for each CCR unit/multiunit, constructed using measurements taken on June 4-5, 2024 and September 26-27, 2024, respectively. The potentiometric surface and inferred groundwater flow direction for the events completed in 2024 were generally consistent with previous events that have been conducted at LRS since monitoring began in 2016.

Groundwater flow velocities were calculated for each unit/multi-unit using measurements from the semi-annual assessment monitoring events in June and September 2024, as presented in **Appendix I** and summarized below:

	Calculated Seepage Velocities (feet/day)		
CCR Unit/multi-unit	Minimum	Maximum	Average
Bottom Ash Pond 1	0.027	0.45	0.11
Bottom Ash Pond 2, Bottom Ash Pond 3, Ash Landfill	0.013	2.7	0.19
Emergency Holding Ponds	0.04	2.9	0.33

Based on the groundwater flow conditions documented in this section, the relative function of the monitoring wells employed in the LRS CCR groundwater monitoring system is as follows:

CCR Unit/multi-unit	Background Wells	Downgradient Wells
Bottom Ash Pond 1	MW-52B, MW-53BR	MW-49B, MW-21B, MW-38B, MW-38C*
Bottom Ash Pond 2, Bottom Ash Pond 3, Ash Landfill	MW-39B, MW-32B	MW-36B, MW-37B, MW-20B, MW-14BR, MW-40B, MW-52B, MW-53BR
Emergency Holding Ponds	MW-41B, MW-42B, MW-43B	MW-44B, MW-45B, MW-46B, MW-47B

* MW-38C was added to the Bottom Ash Pond 1 monitoring program following its installation during groundwater characterization activities in the spring of 2019.

The following monitoring wells are also included in the LRS CCR monitoring system for the purpose of measuring groundwater elevations and evaluating groundwater flow direction and velocity in the vicinity of the bottom ash ponds and landfill: MW-33B, MW-34B, MW-35B, MW-48B, MW-50B, MW-51B, MW-54B, MW-55B, and MW-56B. These wells were added to the list following their installation during groundwater characterization activities conducted in the spring of 2019. Well MW-53B was replaced by MW-53BR in April 2024 prior to the sampling event in June 2024. MW-53B was determined to have a screen failure in September 2023. In addition to the well replacement, surface completions were upgraded in April 2024 for monitoring wells MW-50B, MW-51B, and MW-52B to raise them up to match the surrounding grade of the Pond 3 perimeter access road. Top-of-casing elevations were resurveyed by Basin Electric staff after the completion of well upgrade activities.

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3. Groundwater Quality

The semiannual Assessment monitoring events in June and September 2024 included samples from each well in the CCR unit/multiunit program.

The samples collected for each event were submitted under chain-of-custody to the Eurofins Denver Laboratory located in Arvada, Colorado for analysis of the analytes included CCR Rule Appendix III and Appendix IV. The laboratory reports issued by Eurofins for these events were reviewed against the chain-of-custody forms and for compliance with maximum holding times and conformance with project-required methods with copies included in the LRS operating record. The reported analytical results from Eurofins were reviewed and verified by an AECOM data validator/chemist using USEPA guidelines (USEPA 2020[1]). Data validation concluded that field and laboratory precision, field and laboratory accuracy, method compliance, and data set completeness were acceptable based on the data reported. Data validation reports were prepared for each monitoring event and are included in the operating record. The validated results for the June and September 2024 sampling events were compiled into summary form as presented in **Tables 2, 3**, and **4** with the results of quality assurance/quality control field blank samples presented in **Table 5**. Copies of the Eurofins analytical laboratory and data validation reports for the June and September 2024 events are included as **Appendix II**.

[1] U.S. Environmental Protection Agency (USEPA). 2020. Superfund CLP National Functional Guidelines for Data Review. November 2020.

Figures

AECOM
Figure: 1

Potentiometric Surface Map
June 4-5, 2024

Basin Electric
Laramie River Station
Platte County, Wyoming
Project No.: 60732883 Date: 12/30/2024

Laramie River

Landfill

Ash Pond 2

Ash Pond 1

Ash Pond 3

Emergency Holding Ponds

MW-54B 4447.78
MW-45B 4456.63
MW-46B 4453.88
MW-47B 4449.01
MW-44B 4461.7
MW-43B 4471.75
MW-36B 4475.61
MW-37B 4471.32
MW-20B 4477.42
MW-42B 4472.99
MW-35B 4488.09
MW-41B 4477.2
MW-14BR 4485.06
MW-23B NM
MW-49B 4490.87
MW-55B 4487.17
MW-34B 4494.33
MW-48B 4494.27
MW-22B NM
MW-56B 4488.84
MW-21B 4487.43
MW-33B 4503.11
MW-50B 4501.48
MW-38C 4493.75
MW-38B 4493.69
MW-51B 4500.53
MW-52B 4499.58
MW-53BR 4498.57
MW-40B 4501.5
MW-32B 4513.77
MW-39B 4507.34

4450 4455 4460 4465 4470 4475 4480 4485 4490 4495 4500 4505 4510

N W E S

0 750 1,500 3,000 Feet

1 " = 1,500 '

Legend

- AECOM Monitoring Well
- Landfill
- Pond
- Basin Electric Laramie River Station Facility Boundary
- 4,447.60 - Groundwater Elevation (ft AMSL)
- Groundwater Elevation (ft AMSL)
- Groundwater Elevation (ft AMSL) Contour Inferred
- Groundater Flow Direction

NM - Not Measured
See Table 1 for additional details.
ft AMSL - feet Above Mean Sea Level
4491.75* - Value Not Used

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Laramie River

MW-54B 4446.58
MW-45B 4455.91
MW-46B 4453.08
MW-47B 4448.51
MW-44B 4460.89
MW-36B 4474.9
MW-37B 4471.87
MW-43B 4476.6
MW-35B 4485.28
MW-20B 4476.87
MW-41B 4476.75
MW-42B 4472.99
MW-14BR 4484.11
MW-34B 4491.13
MW-49B 4490.37
MW-23B NM
MW-55B 4485.77
MW-22B NM
MW-48B 4493.67
MW-56B 4488.05
MW-33B 4500.31
MW-21B 4485.78
MW-38B 4492.39
MW-38C 4492.38
MW-53BR 4497.69
MW-50B 4500.93
MW-51B 4499.94
MW-52B 4498.9
MW-32B 4510.72
MW-40B 4500.8
MW-39B 4506.39

Landfill
Ash Pond 2
Ash Pond 1
Ash Pond 3
Emergency Holding Ponds

4450
4455
4460
4465
4470
4475
4480
4485
4490
4495
4500
4505
4510

N
W E
S

0 750 1,500 3,000 Feet

1 " = 1,500 '

Legend

- AECOM Monitoring Well
- Landfill
- Pond
- Basin Electric Laramie River Station Facility Boundary
- 4,447.60 - Groundwater Elevation (ft AMSL)
- Groundwater Elevation (ft AMSL)
- Groundwater Elevation (ft AMSL) Contour Inferred
- Groundater Flow Direction

NM - Not Measured
See Table 1 for additional details.
ft AMSL - feet Above Mean Sea Level
4491.75* - Value Not Used

Basin Electric
Laramie River Station
Platte County, Wyoming
Project No.: 60732883 Date: 12/30/2024

Potentiometric Surface Map
September 26-27, 2024

AECOM
Figure: 2

Filepath: \\na.aecomnet.com\lfs\AMER\FortCollins-USFCO4\Legacy\USFCO4FP001\Data2\WORKING\60632474 Basin 2020 Support\900- GIS_CAD\Figure_05_02_LRS_CCR_MonitoringWells_September2024.mxd

Tables

Table 1: Groundwater Elevations

Location ID	TOC Elevation (feet amsl)	Date Gauged	Depth to Water (TOC feet)	Water Level Elevation (feet amsl)	Date Gauged	Depth to Water (TOC feet)	Water Level Elevation (feet amsl)
MW-14BR	4540.51	6/5/2024	55.45	4,485.06	9/26/24 - 9/27/24	56.40	4,484.11
MW-20B	4535.47	6/5/2024	58.05	4,477.42	9/26/24 - 9/27/24	58.60	4,476.87
MW-21B	4539.58	6/5/2024	52.15	4,487.430	9/26/24 - 9/27/24	53.80	4,485.78
MW-32B	4569.72	6/5/2024	55.95	4,513.77	9/26/24 - 9/27/24	59.00	4,510.72
MW-33B	4569.22	6/5/2024	66.11	4,503.11	9/26/24 - 9/27/24	68.91	4,500.31
MW-34B	4557.33	6/5/2024	63.00	4,494.33	9/26/24 - 9/27/24	66.20	4,491.13
MW-35B	4551.28	6/5/2024	63.19	4,488.09	9/26/24 - 9/27/24	66.00	4,485.28
MW-36B	4535.05	6/5/2024	59.44	4,475.61	9/26/24 - 9/27/24	60.15	4,474.90
MW-37B	4532.98	6/5/2024	61.66	4,471.32	9/26/24 - 9/27/24	61.11	4,471.87
MW-38B	4550.09	6/5/2024	56.40	4,493.69	9/26/24 - 9/27/24	57.70	4,492.39
MW-38C	4549.45	6/5/2024	55.70	4,493.75	9/26/24 - 9/27/24	57.07	4,492.38
MW-39B	4584.06	6/5/2024	76.72	4,507.34	9/26/24 - 9/27/24	77.67	4,506.39
MW-40B	4592.20	6/5/2024	90.70	4,501.50	9/26/24 - 9/27/24	91.40	4,500.80
MW-41B	4532.25	6/4/2024	55.05	4,477.20	9/26/24 - 9/27/24	55.50	4,476.75
MW-42B	4518.44	6/4/2024	45.45	4,472.99	9/26/24 - 9/27/24	45.45	4,472.99
MW-43B	4504.05	6/4/2024	32.30	4,471.75	9/26/24 - 9/27/24	27.45	4,476.60
MW-44B	4532.00	6/4/2024	70.30	4,461.70	9/26/24 - 9/27/24	71.11	4,460.89
MW-45B	4533.53	6/4/2024	76.90	4,456.63	9/26/24 - 9/27/24	77.62	4,455.91
MW-46B	4530.33	6/5/2024	76.45	4,453.88	9/26/24 - 9/27/24	77.25	4,453.08
MW-47B	4525.21	6/4/2024	76.20	4,449.01	9/26/24 - 9/27/24	76.70	4,448.51
MW-48B	4571.27	6/5/2024	77.00	4,494.27	9/26/24 - 9/27/24	77.60	4,493.67
MW-49B	4566.97	6/5/2024	76.10	4,490.87	9/26/24 - 9/27/24	76.60	4,490.37
MW-50B	4593.48	6/5/2024	92.00	4,501.48	9/26/24 - 9/27/24	92.55	4,500.93
MW-51B	4593.14	6/5/2024	92.61	4,500.53	9/26/24 - 9/27/24	93.20	4,499.94
MW-52B	4593.30	6/5/2024	93.72	4,499.58	9/26/24 - 9/27/24	94.40	4,498.90
MW-53BR*	4592.89	6/5/2024	94.32	4,498.57	9/26/24 - 9/27/24	95.20	4,497.69
MW-54B	4454.80	6/5/2024	7.02	4,447.78	9/26/24 - 9/27/24	8.22	4,446.58
MW-55B	4532.37	6/5/2024	45.20	4,487.17	9/26/24 - 9/27/24	46.60	4,485.77
MW-56B	4541.95	6/5/2024	53.11	4,488.84	9/26/24 - 9/27/24	53.90	4,488.05

Notes:

TOC = top of casing

feet amsl = feet above mean sea level

ID = Identification

NM[1] = Not Measured - Well Not Found

NM = Not Measured

* = MW-53B replaced with MW-53BR in April 2024

Vertical Datum: North American Verical Datum of 1988 (NAVD 88)

Table 2: Groundwater Analytical Data - Bottom Ash Pond 1
Basin Electric Power Cooperative, Laramie River Station, Wyoming
Sampling and Analysis Report

				Appendix III Constituents							Appendix IV Constituents													
			Chemical Name	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226/228	Selenium	Thallium
			Unit	mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
Relative Location	Well ID	Sample Date	Sample Type																					
Background	MW-52B	6/5/2024	N	0.185	184	48.8	0.298 J	7.38	477	1100	< 0.002	0.00303 J	0.1	< 0.001	< 0.001	0.00369	0.00201	0.00125	0.0597	< 0.0002	0.00414	1.26	0.00203 J	< 0.001
	MW-52B	9/26/2024	N	0.167	141	53.3	0.378 J	7.89	466	928	.000118 J	0.00292 J	0.116	< 0.00100	< 0.00100	0.00458	0.00584	0.000924 J	0.0651	< 0.000200	0.00994	3.39	0.00117J	< 0.00100
	MW-53BR	6/5/2024	N	0.103	118	33.1	0.771	7.30	171	527	< 0.002	0.00451 J	0.255	0.000911 J	< 0.001	0.0185	0.00735	0.00811	0.080	< 0.0002	0.00929	2.57	0.00103 J	< 0.001
	MW-53BR	9/26/2024	N	0.125	121	39.8	1.03	7.39	261	753	< 0.00200	0.00158 J	0.0884	< 0.00100	< 0.00100	0.00308	0.00314	0.000619 J	0.0597	< 0.000200	0.0111	0.93	0.00848	< 0.00100
Downgradient	MW-21B	6/5/2024	N	0.327	728	648	2.8	7.4	1910	4000	< 0.00200	0.00260 J	0.0518	< 0.00100	< 0.00100	0.00443	< 0.001	< 0.001	0.0769	< 0.000200	0.0162	< 0.651	0.0478	< 0.00100
	MW-21B	9/27/2024	N	0.283	689	636	0.665 J-	7.41	1970	3690	< 0.00200	0.00251 J-	0.0492	< 0.00100	< 0.00100	0.00534	< 0.001	0.000246 J	0.0782	< 0.000200	0.108	0.284 J	0.0102	< 0.00100
	MW-38B	6/5/2024	N	3.63	470	261	1.12	7.28	5150	8490	< 0.002	0.00405 J	0.0167	< 0.001	< 0.001	0.00585	0.000499 J	< 0.001	0.125	< 0.0002	0.198	0.314 J	0.00500	< 0.001
	MW-38B	9/27/2024	Duplicate	3.12	486	279	0.548	7.34	5730	7290	< 0.002	0.00382 J	0.0155	< 0.001	< 0.001	0.00702	0.000469 J	< 0.001	0.113	< 0.0002	0.188	0.785	0.00431 J	< 0.001
	MW-38B	9/27/2024	N	3.08	476	275	0.538	7.34	5560	7330	< 0.002	0.00380 J	0.0158	< 0.001	< 0.001	0.00694	0.000508 J	< 0.001	0.115	< 0.0002	0.189	0.613	0.00466 J	< 0.001
	MW-38C	6/5/2024	N	0.0696 J	109	30.3	0.589	7.40	198	673	< 0.002	0.00294 J	0.0515	< 0.001	< 0.001	0.000959 J	< 0.001	< 0.001	0.0304	< 0.0002	0.00654	0.247 J	0.00717	< 0.001
	MW-38C	9/27/2024	N	0.0627 J	102	33.1	0.669	7.35	257	653	< 0.002	0.00258 J	0.0409	< 0.001	< 0.001	0.00115	< 0.001	< 0.001	0.0319	< 0.0002	0.00518	<0.693	0.00507	< 0.001
	MW-49B	6/5/2024	N	0.184	152	33.3	0.483 J	7.44	395	926	< 0.002	0.00336 J	0.064	< 0.001	< 0.001	0.000987 J	< 0.001	< 0.001	0.0581	< 0.0002	0.00384	0.301 J	< 0.00500	< 0.001
	MW-49B	9/25/2024	N	0.204	143	27.7	0.609	7.43	358	820	< 0.002	0.00289 J	0.0561	< 0.001	< 0.001	0.000688 J	< 0.001	< 0.001	0.0481	< 0.0002	0.00296	0.306 J	< 0.00500	< 0.001

Notes:
< = value less than the reporting limit
J = estimated concentration (+ = high bias; - = low bias)
mg/L = milligrams per liter
N = normal (i.e., not a duplicate sample)
NS = not sampled
pCi/L = picoCuries per liter
R = result is rejected
SU = standard units
TDS = total dissolved solids
UJ = results estimated to be non-detect

Table 3: Groundwater Analytical Data - Bottom Ash Pond 2, Bottom Ash Pond 3, Ash Landfill
Basin Electric Cooperative, Laramie River Station, Wyoming
Sampling and Analysis Report

				Appendix III Constituents							Appendix IV Constituents													
		Chemical Name		Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226/228	Selenium	Thallium
		Unit		mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
Relative Location	**Well ID**	**Sample Date**	**Sample Type**																					
Background	MW-32B	6/4/2024	N	0.334	255	125	0.502	7.03	1050	2180	< 0.00200	0.00129 J	0.0362	< 0.00100	< 0.00100	0.000821 J	< 0.00100	< 0.00100	0.0933	< 0.000200	0.00275	0.258	0.00248 J	< 0.00100
	MW-32B	9/26/2024	N	324	249	126	0.53	7.04	1090	2050	< 0.00200	0.00149 J	0.0319	< 0.00100	< 0.00100	0.000846 J	< 0.00100	< 0.00100	0.0859	< 0.000200	0.00278	1.26	0.00218 J	< 0.00100
	MW-39B	6/4/2024	N	0.194	211	48.8	0.521	7.24	566	1360	< 0.00200	0.00296 J	0.0335	< 0.00100	< 0.00100	0.000530 J	< 0.00100	< 0.00100	0.0695	< 0.000200	0.00357	0.375	0.00103 J	< 0.00100
	MW-39B	9/26/2024	N	0.183	151	51.6	0.704	7.1	530	1180	< 0.00200	0.00320 J	0.0301	< 0.00100	< 0.00100	0.000840 J	< 0.00100	< 0.00100	0.0668	< 0.000200	0.00418	<0.575	0.00454J	< 0.00100
Downgradient	MW-14BR	6/5/2024	N	0.169	210	93.8	0.335 J	7.53	428	1040	< 0.00200	0.00291 J	0.0539	< 0.00100	< 0.00100	0.0062	< 0.00100	< 0.00100	0.0388	< 0.000200	0.0121	0.264 J	0.0201	< 0.00100
	MW-14BR	9/25/2024	N	0.186	161	70.7	0.593	7.56	363	958	< 0.00200	0.00287 J	0.0524	< 0.00100	< 0.00100	0.00484	< 0.00100	0.00284 J	0.0321	< 0.000200	0.0774	<0.526	0.0102	< 0.00100
	MW-20B	6/5/2024	N	0.234	140	47.6	0.712	7.5	379	930	< 0.00200	0.00282 J	0.0588	< 0.00100	< 0.00100	0.000522 J-	< 0.00100 UJ	< 0.00100	0.0433	< 0.000200	0.0085	0.383	0.00304 J	< 0.00100
	MW-20B	9/25/2024	N	0.254	149	48.4	0.794	7.5	411	957	< 0.00200	0.00227 J	0.0558	< 0.00100	< 0.00100	0.000572 J	< 0.00100 UJ	< 0.00100	0.0442	< 0.000200	0.00892	0.319 J	0.00258	< 0.00100
	MW-36B	6/5/2024	N	0.114	147	45.9	0.637	7.52	376	920	0.00273	0.00299 J	0.0713	0.000492 J	0.000242 J	0.00125 J	< 0.00100	< 0.00100	0.0392	< 0.000200	0.00819	0.481	0.00709	0.000220 J
	MW-36B	9/27/2024	N	0.128	131	48.5	0.734	7.54	378	848	< 0.00200	0.00309 J	0.0704	< 0.00100	< 0.00100	0.000841 J	< 0.00100	< 0.00100	0.0438	< 0.000200	0.00762	0.54	0.0098	< 0.00100
	MW-37B	6/4/2024	N	0.191	208	81.8	0.407 J	7.31	514	1220	< 0.00200	0.00243 J	0.0704	< 0.00100	< 0.00100	0.00319	< 0.00100	< 0.00100	0.0451	< 0.000200	0.0402	0.407	0.00633	< 0.00100
	MW-37B	9/25/2024	N	0.186	207	80.7	0.603	7.29	554	1200	< 0.00200	0.00233 J	0.0621	< 0.00100	< 0.00100	0.00247 J	< 0.00100	< 0.00100	0.0416	< 0.000200	0.0376	1.13	0.00558	< 0.00100
	MW-40B	6/5/2024	N	0.176	139	32.8	0.845	7.45	315	904	0.000703 J	0.00506	0.0294	< 0.00100	< 0.00100	0.000658 J	< 0.00100	< 0.00100	0.0612	< 0.000200	0.00548	0.606	0.00470 J	< 0.00100
	MW-40B	9/26/2024	N	176	138	35.9	0.936	7.38	277	874	< 0.00200	0.00552	0.0274	< 0.00100	< 0.00100	0.000603 J	< 0.00100	< 0.00100	0.0558	< 0.000200	0.00657	0.12	0.00553	< 0.00100
	MW-52B	6/5/2024	N	0.185	184	48.8	0.298 J	7.38	477	1100	< 0.00200	0.00303 J	0.1	< 0.00100	< 0.00100	0.00369	0.00201	0.00125	0.0597	< 0.000200	0.00414	1.26	0.00203 J	< 0.00100
	MW-52B	9/26/2024	N	0.167	141	53.3	0.378 J	7.89	466	928	.000118 J	0.00292 J	0.116	< 0.00100	< 0.00100	0.00458	0.00584	0.000924 J	0.0651	< 0.000200	0.00994	3.39	0.00117J	< 0.00100
	MW-53BR	6/5/2024	N	0.103	118	33.1	0.771	7.3	171	527	< 0.00200	0.00451 J	0.255	0.000911 J	< 0.00100	0.0185	0.00735	0.00811	0.08	< 0.000200	0.00929	2.57	0.00103 J	< 0.00100
	MW-53BR	9/26/2024	N	0.125	121	39.8	1.03	7.39	261	753	< 0.00200	0.00158 J	0.0884	< 0.00100	< 0.00100	0.00308	0.00314	0.000619 J	0.0597	< 0.000200	0.0111	0.93	0.00848	< 0.00100

Notes:
< = value less than the reporting limit
FD = field duplicate
J = estimated concentration (+ = high bias; - = low bias)
mg/L = milligrams per liter
N = normal (i.e., not a duplicate sample)
NS = not sampled
pCi/L = picoCuries per liter
R = result is rejected
SU = standard units
TDS = total dissolved solids
UJ = undetected, reporting limit is estimated

Table 4: Groundwater Analytical Data - Emergency Holding Ponds
Basin Electric Cooperative, Laramie River Station, Wyoming
Sampling and Analysis Report

				Appendix III Constituents							Appendix IV Constituents													
Chemical Name				Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226/228	Selenium	Thallium
Unit				mg/L	mg/L	mg/L	mg/L	SU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
Relative Location	Well ID	Sample Date	Sample Type																					
Background	MW-41B	6/4/2024	N	0.922	117	72.4	0.592	7.52	579	1290	< 0.00200	0.00478 J	0.0241	< 0.00100	< 0.00100	0.00578	0.000648 J	< 0.00100	0.052	< 0.000200	0.0874	0.174	0.00648	< 0.00100
	MW-41B	9/26/2024	N	0.893	102	66.8	0.638	7.49	569	1130	< 0.00200	0.00460 J	0.02	< 0.00100	< 0.00100	0.00566	0.000586 J	< 0.00100	0.00448	< 0.000200	0.0843	<0.156	0.00585	< 0.00100
	MW-42B	6/4/2024	N	0.825	577	327	2.04	7.09	2470	4150	< 0.00200	0.00356 J	0.0353	< 0.00100	< 0.00100	0.00366	< 0.00100	< 0.00100	0.0954	< 0.000200	0.0436	0.320 J	0.00969	< 0.00100
	MW-42B	9/26/2024	N	0.742	309	219	0.632	7.37	1310	2280	< 0.00200	0.00449 J	0.02	< 0.00100	< 0.00100	0.00209	< 0.00100	< 0.00100	0.0635	< 0.000200	0.027	<0.571	0.0162	< 0.00100
	MW-43B	6/4/2024	N	0.263	214	134	0.598	7.25	782	1630	< 0.00200	0.00324 J	0.0589	< 0.00100	< 0.00100	0.00150 J	< 0.00100	< 0.00100	0.0451	< 0.000200	0.00893	0.439	0.00340 J	< 0.00100
	MW-43B	9/26/2024	N	0.264	227	126	0.552	7.23	920	1680	< 0.00200	0.00312 J	0.0588	< 0.00100	< 0.00100	0.00278 J	< 0.00100	< 0.00100	0.0538	< 0.000200	0.00988	0.647	0.00314 J	< 0.00100
Downgradient	MW-44B	6/4/2024	N	0.109	190	61.7	0.383 J	7.4	450	1170	< 0.00200	0.00267 J	0.0546	< 0.00100	< 0.00100	0.00475	< 0.00100	< 0.00100	0.0444	< 0.000200	0.00734	0.588	0.00514	< 0.00100
	MW-44B	9/26/2024	N	0.115	186	64.4	0.811	7.39	466	1060	< 0.00200	0.00309 J	0.0505	< 0.00100	< 0.00100	0.00457	< 0.00100	< 0.00100	0.04	< 0.000200	0.0062	<0.621	0.00785	< 0.00100
	MW-45B	6/4/2024	N	0.202	162	51.8	0.858	7.56	363	936	< 0.00200	0.00332 J	0.0486	< 0.00100	< 0.00100	0.00144 J	< 0.00100	< 0.00100	0.0412	< 0.000200	0.00725	0.585	0.00804	< 0.00100
	MW-45B	9/26/2024	N	0.204	162	54.7	0.858	7.51	391	852	< 0.00200	0.00352 J	0.0464	< 0.00100	< 0.00100	0.00129 J	< 0.00100	< 0.00100	0.0442	< 0.000200	0.00708	0.781	0.00803	< 0.00100
	MW-46B	6/5/2024	N	0.0681 J	129	58.9	0.65	7.33	338	827	< 0.00200	0.00257 J	0.0721	< 0.00100	< 0.00100	0.0169	< 0.00100	< 0.00100	0.0338	< 0.000200	0.00421	0.331	0.00400 J	< 0.00100
	MW-46B	9/27/2024	N	0.0856 J	113	46.6	0.763	7.46	298	702	< 0.00200	0.00276 J	0.0592	< 0.00100	< 0.00100	0.0103	< 0.00100	< 0.00100	0.0379	< 0.000200	0.0034	<0.637	0.00431 J	< 0.00100
	MW-47B	6/4/2024	N	0.15	138	35.5	0.476 J	7.46	312	796	0.00123 J	0.00313 J	0.0771	< 0.00100	< 0.00100	0.0058	< 0.00100	< 0.00100	0.0348	< 0.000200	0.00588	0.423	0.00532	< 0.00100
	MW-47B	9/26/2024	N	0.15	130	36.8	0.480 J	7.36	340	756	< 0.00200	0.00297 J	0.0756	< 0.00100	< 0.00100	0.00626	< 0.00100	< 0.00100	0.0361	< 0.000200	0.0057	<0.530	0.00415 J	< 0.00100

Notes:
< = value less than the reporting limit
J = estimated concentration (+ = high bias; - = low bias)
mg/L = milligrams per liter
N = normal (i.e., not a duplicate sample)
pCi/L = picoCuries per liter
SU = standard units
TDS = total dissolved solids

Table 5: Groundwater Analytical Data - Field Blanks
Basin Electric Cooperative, Laramie River Station, Wyoming
Sampling and Analysis Report

			Appendix III Constituents						Appendix IV Constituents													
Chemical Name			Boron	Calcium	Chloride	Fluoride	Sulfate	TDS	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Lead	Lithium	Mercury	Molybdenum	Radium 226/228	Selenium	Thallium
Unit			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pCi/L	mg/L	mg/L
Sample ID	**Sample Date**	**Sample Type**																				
Field Blank	6/5/2024	FB	< 0.1	< 0.2	< 3.0	< 0.500	< 5.00	11	< 0.002	< 0.005	< 0.003	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.02	< 0.0002	< 0.002	< 0.372	< 0.005	< 0.001

Notes:
FB = field blank
mg/L = milligrams per liter
pCi/L = picoCuries per liter
TDS = Total dissolved solids
< = value less than the method detection limit

Appendix I

Groundwater Flow Calculations

Project:	**Laramie River Station**	CCR Unit:	**Bottom Ash Pond 1**	Background Wells:	MW-52B, MW-53B
Calculations by:	Justin Henry	Checked by:	Jeremy Hurshman	Downgradient Wells:	MW-49B, MW-21B, MW-38B
Date:	1/12/2025	Date:	1/23/2025		

Hydrualic Gradient (i, ft/ft)

$$i = -{}^{dh}/_{dl}$$

where, i= hydraulic gradient
dh= change in hydraulic head between upgradient and downgradient locations
dl= horizontal distance between upgradient and downgradient locations, parallel to flow (perpendicular to potentiometric contours)

Date	Upgradient WL elevation (ft MSL)	Downgradient WL Elevation (ft MSL)	dh (ft)	dl (ft)	i (ft/ft)
June 5, 2024 (49B)	4500	4490.87	9.13	1050	0.00870
June 5, 2024 (52B)	4499.58	4490	9.58	1095	0.00875
September 26-27, 2024 (49B)	4500	4490.37	9.63	1200	0.00803
Septhember 26-27, 2024 (52B)	4498.9	4490	8.90	1140	0.00781
				Minimum	**0.00781**
				Maximum	**0.00875**
				Average	**0.00832**

Hydraulic Conductivity (K, ft/d)

K, from slug and pumping tests		
Minimum	1.04	ft/day
Maximum	1.04	ft/day
Average (geomean)	1.04	ft/day

Specific Yield, Effective Porosity

Specific Yield, Effective Porosity	
Minimum	0.02
Maximum	0.3
Average	0.15

Note: Effective porosity/specific yield is based on literature values from Arikaree Formation literature and textbook values for sandstone

Seepage Velocity

$$v_s = {}^{-K * i}/_{n_e}$$

where, v_s= seepage velocity, feet per day (ft/d)
K= hydraulic conductivity, feet per day (ft/d)
i= hydraulic gradient, feet per foot (ft/ft)
n_e= effective porosity/specific yield, unitless

Calculated Seepage Velocities (ft/day)				
	K (ft/day)	**i (ft/ft)**	**n_e**	**v_s (ft/day)**
Minimum	1.04	0.0078	0.30	**0.027**
Maximum	1.04	0.0087	0.02	**0.45**
			Geometric Mean	**0.11**

Project:	**Laramie River Station**	CCR Unit:	**Bottom Ash Ponds 2&3 and Ash Landfill**	Background Wells:	MW-39B, MW-32B
Calculations by:	Justin Henry	Checked by:	Jeremy Hurshman	Downgradient Wells:	MW-36B, MW-37B, MW-20B, MW-14BR, MW-40B, MW-52B, MW-53B
Date:	1/12/2025	Date:	1/23/2025		

Hydrualic Gradient (i, ft/ft)

$$i = -dh/dl$$

where, i= hydraulic gradient
dh= change in hydraulic head between upgradient and downgradient locations
dl= horizontal distance between upgradient and downgradient locations, parallel to flow (perpendicular to potentiometric contours)

Summary Table - Hydraulic Gradient

Date	Vector	Upgradient WL elevation (ft MSL)	Downgradient WL Elevation (ft MSL)	dh (ft)	dl (ft)	i (ft/ft)	Average i (ft/ft)
June 4, 2024	Vector 1 (36B)	4505	4475.61	29.39	3600	0.0082	
	Vector 2 (48B)	4505	4494.27	10.73	1230	0.0087	0.0087
	Vector 3 (37B)	4505	4471.32	33.68	3675	0.0092	
September 26-27, 2024	Vector 1 (36B)	4505	4474.9	30.10	3975	0.0076	
	Vector 2 (48B)	4505	4493.67	11.33	1575	0.0072	0.0078
	Vector 3 (37B)	4500	4471.87	28.13	3300	0.0085	
						Minimum	**0.0078**
						Maximum	**0.0087**
						Average	**0.0082**

Hydraulic Conductivity (K, ft/d)

K from slug and pumping tests conducted at site		
Minimum	0.50	ft/day
Maximum	6.16	ft/day
Average (geomean)	1.54	ft/day

Specific Yield, Effective Porosity

Specific Yield, Effective Porosity	
Minimum	0.02
Maximum	0.3
Average	0.15

Note: Effective porosity/specific yield is based on literature values from Arikaree Formation literature and textbook values for sandstone

Seepage Velocity

$$v_s = -K * i / n_e$$

where, v_s= seepage velocity, feet per day (ft/d)
K= hydraulic conductivity, feet per day (ft/d)
i= hydraulic gradient, feet per foot (ft/ft)
n_e= effective porosity/specific yield, unitless

Calculated Seepage Velocities (ft/day)				
	K (ft/day)	i (ft/ft)	n_e	v_s (ft/day)
Minimum	0.50	0.0078	0.30	**0.013**
Maximum	6.16	0.0087	0.02	**2.7**
			Geometric Mean	**0.19**

Project:	**Laramie River Station**	CCR Unit:	**Emergency Holding Ponds**	Background Wells:	MW-41B, MW-42B, MW-43B
Calculations by:	Justin Henry	Checked by:	Jeremy Hurshman	Downgradient Wells:	MW-44B, MW-45B, MW-46B, MW-47B
Date:	1/12/2025	Date:	1/23/2025		

Hydrualic Gradient (i, ft/ft)

Governing Equation:
(Hydraulic Gradient)

$$i = -dh/dl$$

where, i= hydraulic gradient
dh= change in hydraulic head between upgradient and downgradient locations
dl= horizontal distance between upgradient and downgradient locations, parallel to flow (perpendicular to potentiometric contours)

Calculation Table

Date	Vector	Upgradient WL elevation (ft MSL)	Downgradient WL Elevation (ft MSL)	dh (ft)	dl (ft)	i (ft/ft)	Average i (ft/ft)
June 4, 2024	Vector 1 (42B)	4472.99	4455	17.99	1200	0.0150	0.0149
	Vector 2 (43B)	4471.75	4450	21.75	1470	0.0148	
September 26-27, 2024	Vector 1 (42B)	4472.99	4455	17.99	1095	0.0164	0.0185
	Vector 2 (43B)	4476.60	4450	26.60	1290	0.0206	
						Minimum	**0.0149**
						Maximum	**0.0185**
						Average	**0.0167**

Hydraulic Conductivity (K, ft/d)

K from slug and pumping tests conducted at site		
Minimum	0.75	ft/day
Maximum	3.12	ft/day
Average (geomean)	1.31	ft/day

Specific Yield, Effective Porosity

Specific Yield, Effective Porosity	
Minimum	0.02
Maximum	0.3
Average	0.15

Note: Effective porosity/specific yield is based on literature values from Arikaree Formation literature and textbook values for sandstone

Seepage Velocity

$$v_s = -K * i / n_e$$

where, v_s= seepage velocity, feet per day (ft/d)
K= hydraulic conductivity, feet per day (ft/d)
i= hydraulic gradient, feet per foot (ft/ft)
n_e= effective porosity/specific yield, unitless

Calculated Seepage Velocities (ft/day)				
	K (ft/day)	i (ft/ft)	n_e	v_s (ft/day)
Minimum	0.75	0.0149	0.30	**0.04**
Maximum	3.12	0.0185	0.02	**2.9**
			Geometric Mean	**0.33**

Appendix II

Analytical Laboratory and Data Validation Reports

eurofins | Environment Testing

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

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Katie Abbott
AECOM Technical Services Inc.
6200 S. Quebec Street
Greenwood Village, Colorado 80111

Generated 6/20/2024 8:18:00 PM

JOB DESCRIPTION

Basin 2024 Support

JOB NUMBER

280-192407-1

Eurofins Denver
4955 Yarrow Street
Arvada CO 80002

See page two for job notes and contact information.

my EOL

Job Notes

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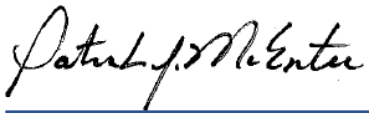
The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



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Authorized for release by
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Definitions/Glossary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Qualifiers

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
280-192407-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

- Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 6/6/2024 12:10 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 2.4°C, 3.6°C, 4.5°C, 4.6°C and 4.6°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

Receipt Exceptions
Radium 226 and Radium 228 results are reported in SDG 280-192407-2. All other requested analyses are reported in SDG 280-192407-1. 280-192407-1, 280-192407-2, 280-192407-3, 280-192407-4, 280-192407-5, 280-192407-6, 280-192407-7, 280-192407-8, 280-192407-9, 280-192407-10, 280-192407-11, 280-192407-11[MS], 280-192407-11[MSD], 280-192407-12, 280-192407-13, 280-192407-14, 280-192407-15, 280-192407-16, 280-192407-17, 280-192407-18, 280-192407-19, 280-192407-20, 280-192407-21 and 280-192407-22

Method 6010D - Metals (ICP)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Metals (ICP). The samples were prepared on 6/6/2024, 6/7/2024 and 6/18/2024 and analyzed on 6/7/2024, 6/8/2024, 6/10/2024, 6/13/2024 and 6/19/2024.

Method 6020B - Metals (ICP/MS)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Metals (ICP/MS). The samples were prepared on 6/6/2024, 6/7/2024 and 6/18/2024 and analyzed on 6/10/2024, 6/12/2024, 6/13/2024, 6/14/2024 and 6/19/2024.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 280-656144 and analytical batch 280-656703 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits. 280-192407-11[MSD]

The continuing calibration verification (CCV) associated with batch 280-656703 recovered above the upper control limit for Be. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: 280-192407-16, 280-192407-17, 280-192407-18, 280-192407-19, 280-192407-20 and CCV 280-656703/53.

Job ID: 280-192407-1 (Continued) Eurofins Denver

Method 7470A - Mercury (CVAA)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Mercury (CVAA). The samples were prepared on 6/13/2024 and analyzed on 6/14/2024.

Method SM 2540C - Solids, Total Dissolved (TDS)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Solids, Total Dissolved (TDS). The samples were analyzed on 6/7/2024 and 6/10/2024.

Method 9056A - Anions, Ion Chromatography
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Anions, Ion Chromatography. The samples were analyzed on 6/7/2024, 6/8/2024, 6/13/2024 and 6/14/2024.

Samples MW-47B (280-192407-1)[5x], MW-45B (280-192407-2)[5x], MW-44B (280-192407-3)[5x], MW-43B (280-192407-4)[10x], MW-42B (280-192407-5)[20x], MW-41B (280-192407-6)[10x], MW-37B (280-192407-7)[10x], MW-39B (280-192407-8)[5x], MW-32B (280-192407-9)[20x], MW-14B (280-192407-10)[5x], MW-20B (280-192407-11)[5x], MW-20B (280-192407-11MS)[5x], MW-20B (280-192407-11MSD)[5x], MW-36B (280-192407-12)[5x], MW-40B (280-192407-13)[5x], MW-52B (280-192407-15)[5x], MW-49B (280-192407-16)[5x], MW-38B (280-192407-17)[20x], MW-38B (280-192407-17)[50x], MW-21B (280-192407-18)[20x], Dup-01 (280-192407-19)[20x], Dup-01 (280-192407-19)[50x], MW-38C (280-192407-20)[10x] and MW-46B (280-192407-22)[5x] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Client Sample ID: MW-47B — Lab Sample ID: 280-192407-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	150		100	1.45	ug/L	1		6010D	Total/NA
Calcium	138000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	34.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.13	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	77.1		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	5.80		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	5.88		2.00	0.370	ug/L	1		6020B	Total/NA
Antimony	1.23	J	2.00	0.400	ug/L	1		6020B	Total/NA
Selenium	5.32		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	35.5		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.476	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	312		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	796		10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-45B — Lab Sample ID: 280-192407-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	202		100	1.45	ug/L	1		6010D	Total/NA
Calcium	162000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	41.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.32	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	48.6		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	1.44	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	7.25		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	8.04		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	51.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.858		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	363		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	936		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-44B — Lab Sample ID: 280-192407-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	109		100	1.45	ug/L	1		6010D	Total/NA
Calcium	190000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	44.4		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.67	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	54.6		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	4.75		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	7.34		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.14		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	61.7		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.383	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	450		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1170		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-43B — Lab Sample ID: 280-192407-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	263		100	1.45	ug/L	1		6010D	Total/NA
Calcium	214000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	45.1		20.0	9.10	ug/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample ID: MW-43B (Continued) — Lab Sample ID: 280-192407-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	3.24	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	58.9		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	1.50	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	8.93		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	3.40	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	134		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.598		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	782		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1630		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-42B — Lab Sample ID: 280-192407-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	825		100	1.45	ug/L	1		6010D	Total/NA
Calcium	577000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	95.4		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.56	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	35.3		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	3.66		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	43.6		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	9.69		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	327		60.0	20.4	mg/L	20		9056A	Total/NA
Fluoride	2.04		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	2470		100	20.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4150		40.0	18.8	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-41B — Lab Sample ID: 280-192407-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	922		100	1.45	ug/L	1		6010D	Total/NA
Calcium	117000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	52.0		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	4.78	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	24.1		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.648	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	5.78		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	87.4		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	6.48		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	72.4		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.592		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	579		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1290		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-37B — Lab Sample ID: 280-192407-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	191		100	1.45	ug/L	1		6010D	Total/NA
Calcium	208000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	45.1		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.43	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	70.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	3.19		3.00	0.500	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-37B (Continued) — Lab Sample ID: 280-192407-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	40.2		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	6.33		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	81.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.407	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	514		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	1220		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-39B — Lab Sample ID: 280-192407-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	194		100	1.45	ug/L	1		6010D	Total/NA
Calcium	211000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	69.5		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.96	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	33.5		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.530	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	3.57		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	1.03	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	48.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.521		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	566		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1360		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-32B — Lab Sample ID: 280-192407-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	334		100	1.45	ug/L	1		6010D	Total/NA
Calcium	255000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	93.3		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	1.29	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	36.2		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.821	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	2.75		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	2.48	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	125		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.502		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	1050		100	20.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	2180		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-14B — Lab Sample ID: 280-192407-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	169		100	1.45	ug/L	1		6010D	Total/NA
Calcium	210000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	38.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.91	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	53.9		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	6.20		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	12.1		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	20.1		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	93.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.335	J	0.500	0.165	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-14B (Continued) — Lab Sample ID: 280-192407-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	428		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1040		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-20B — Lab Sample ID: 280-192407-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	234		100	1.45	ug/L	1		6010D	Total/NA
Calcium	140000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	43.3		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.82	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	58.8		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.522	J F1	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	8.50		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	3.04	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	47.6		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.712		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	379		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	930		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-36B — Lab Sample ID: 280-192407-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	114		100	1.45	ug/L	1		6010D	Total/NA
Calcium	147000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	39.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.99	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	71.3		3.00	0.380	ug/L	1		6020B	Total/NA
Beryllium	0.492	J	1.00	0.303	ug/L	1		6020B	Total/NA
Cadmium	0.242	J	1.00	0.190	ug/L	1		6020B	Total/NA
Chromium	1.25	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	8.19		2.00	0.370	ug/L	1		6020B	Total/NA
Antimony	2.73		2.00	0.400	ug/L	1		6020B	Total/NA
Selenium	7.09		5.00	1.00	ug/L	1		6020B	Total/NA
Thallium	0.220	J	1.00	0.210	ug/L	1		6020B	Total/NA
Chloride	45.9		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.637		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	376		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	920		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-40B — Lab Sample ID: 280-192407-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	176		100	1.45	ug/L	1		6010D	Total/NA
Calcium	139000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	61.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	5.06		5.00	0.500	ug/L	1		6020B	Total/NA
Barium	29.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.658	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	5.48		2.00	0.370	ug/L	1		6020B	Total/NA
Antimony	0.703	J	2.00	0.400	ug/L	1		6020B	Total/NA
Selenium	4.70	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	32.8		3.00	1.02	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-40B (Continued) — Lab Sample ID: 280-192407-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.845		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	315		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	904		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-53B2 — Lab Sample ID: 280-192407-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	103		100	1.45	ug/L	1		6010D	Total/NA
Calcium	118000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	80.0		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	4.51	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	255		3.00	0.380	ug/L	1		6020B	Total/NA
Beryllium	0.911	J	1.00	0.303	ug/L	1		6020B	Total/NA
Cobalt	7.35		1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	18.5		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	9.29		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	8.11		1.00	0.230	ug/L	1		6020B	Total/NA
Selenium	1.03	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	33.1		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.771		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	171		5.00	1.03	mg/L	1		9056A	Total/NA
Total Dissolved Solids (TDS)	527		10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-52B — Lab Sample ID: 280-192407-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	185		100	1.45	ug/L	1		6010D	Total/NA
Calcium	184000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	59.7		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.03	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	100		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	2.01		1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	3.69		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	4.14		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	1.25		1.00	0.230	ug/L	1		6020B	Total/NA
Selenium	2.03	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	48.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.298	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	477		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1100		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-49B — Lab Sample ID: 280-192407-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	184		100	1.45	ug/L	1		6010D	Total/NA
Calcium	152000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	58.1		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.36	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	64.0		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.987	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	3.84		2.00	0.370	ug/L	1		6020B	Total/NA
Chloride	33.3		3.00	1.02	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-49B (Continued) — Lab Sample ID: 280-192407-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Fluoride	0.483	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	395		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	926		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-38B — Lab Sample ID: 280-192407-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3630		100	1.45	ug/L	1		6010D	Total/NA
Calcium	470000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	125		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	4.05	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	16.7		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.499	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	5.85		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	198		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.00		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	261		60.0	20.4	mg/L	20		9056A	Total/NA
Fluoride	1.12		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	5150		250	51.5	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	8490		100	47.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-21B — Lab Sample ID: 280-192407-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	327		100	1.45	ug/L	1		6010D	Total/NA
Calcium	728000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	76.9		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.60	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	51.8		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	4.43		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	87.4		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	12.4		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	648		60.0	20.4	mg/L	20		9056A	Total/NA
Fluoride	2.80		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	1910		100	20.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	4000		40.0	18.8	mg/L	1		SM 2540C	Total/NA

Client Sample ID: Dup-01 — Lab Sample ID: 280-192407-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3700		100	1.45	ug/L	1		6010D	Total/NA
Calcium	475000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	124		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.75	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	17.5		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.507	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	6.10		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	196		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.17		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	264		60.0	20.4	mg/L	20		9056A	Total/NA
Fluoride	1.15		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	4560		250	51.5	mg/L	50		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: Dup-01 (Continued)

Lab Sample ID: 280-192407-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Total Dissolved Solids (TDS)	8370		100	47.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-38C

Lab Sample ID: 280-192407-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	69.6	J	100	1.45	ug/L	1		6010D	Total/NA
Calcium	109000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	30.4		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.94	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	51.5		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.959	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	6.54		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	7.17		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	30.3		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.589		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	198		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	673		10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: Field Blank

Lab Sample ID: 280-192407-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	97.7	J B	200	24.1	ug/L	1		6010D	Total/NA
Total Dissolved Solids (TDS)	11.0		10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-46B

Lab Sample ID: 280-192407-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	68.1	J	100	1.45	ug/L	1		6010D	Total/NA
Calcium	129000	B	200	24.1	ug/L	1		6010D	Total/NA
Lithium	33.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.57	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	72.1		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	16.9	B	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	4.21		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.00	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	58.9		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.650		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	338		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	827		10.0	4.70	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET DEN
6020B	Metals (ICP/MS)	SW846	EET DEN
7470A	Mercury (CVAA)	SW846	EET DEN
9056A	Anions, Ion Chromatography	SW846	EET DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET DEN
3010A	Preparation, Total Metals	SW846	EET DEN
3020A	Preparation, Total Metals	SW846	EET DEN
7470A	Preparation, Mercury	SW846	EET 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:

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

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-192407-1	MW-47B	Water	06/04/24 10:42	06/06/24 12:10
280-192407-2	MW-45B	Water	06/04/24 11:12	06/06/24 12:10
280-192407-3	MW-44B	Water	06/04/24 11:42	06/06/24 12:10
280-192407-4	MW-43B	Water	06/04/24 12:39	06/06/24 12:10
280-192407-5	MW-42B	Water	06/04/24 13:24	06/06/24 12:10
280-192407-6	MW-41B	Water	06/04/24 14:29	06/06/24 12:10
280-192407-7	MW-37B	Water	06/04/24 15:12	06/06/24 12:10
280-192407-8	MW-39B	Water	06/04/24 17:10	06/06/24 12:10
280-192407-9	MW-32B	Water	06/04/24 16:18	06/06/24 12:10
280-192407-10	MW-14B	Water	06/05/24 09:21	06/06/24 12:10
280-192407-11	MW-20B	Water	06/05/24 10:49	06/06/24 12:10
280-192407-12	MW-36B	Water	06/05/24 11:36	06/06/24 12:10
280-192407-13	MW-40B	Water	06/05/24 12:22	06/06/24 12:10
280-192407-14	MW-53B2	Water	06/05/24 13:39	06/06/24 12:10
280-192407-15	MW-52B	Water	06/05/24 15:49	06/06/24 12:10
280-192407-16	MW-49B	Water	06/05/24 17:07	06/06/24 12:10
280-192407-17	MW-38B	Water	06/05/24 18:22	06/06/24 12:10
280-192407-18	MW-21B	Water	06/05/24 19:01	06/06/24 12:10
280-192407-19	Dup-01	Water	06/05/24 00:00	06/06/24 12:10
280-192407-20	MW-38C	Water	06/05/24 19:27	06/06/24 12:10
280-192407-21	Field Blank	Water	06/05/24 19:30	06/06/24 12:10
280-192407-22	MW-46B	Water	06/05/24 20:14	06/06/24 12:10

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	150		100	1.45	ug/L		06/07/24 08:24	06/07/24 22:52	1
Calcium	138000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 22:52	1
Lithium	34.8		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:15	1

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	202		100	1.45	ug/L		06/07/24 08:24	06/07/24 22:55	1
Calcium	162000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 22:55	1
Lithium	41.2		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:19	1

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	109		100	1.45	ug/L		06/07/24 08:24	06/07/24 22:59	1
Calcium	190000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 22:59	1
Lithium	44.4		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:23	1

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	263		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:03	1
Calcium	214000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:03	1
Lithium	45.1		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:27	1

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	825		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:07	1
Calcium	577000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:07	1
Lithium	95.4		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:31	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	922		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:11	1
Calcium	117000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:11	1
Lithium	52.0		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:35	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	191		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:15	1
Calcium	208000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:15	1
Lithium	45.1		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:39	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	194		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:19	1
Calcium	211000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:19	1
Lithium	69.5		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:54	1

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	334		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:34	1
Calcium	255000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:34	1
Lithium	93.3		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:58	1

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	169		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:38	1
Calcium	210000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:38	1
Lithium	38.8		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:02	1

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	234		100	1.45	ug/L		06/07/24 08:24	06/07/24 23:41	1
Calcium	140000	B	200	24.1	ug/L		06/07/24 08:24	06/07/24 23:41	1
Lithium	43.3		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:06	1

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	114		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:01	1
Calcium	147000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:01	1
Lithium	39.2		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:25	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	176		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:05	1
Calcium	139000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:05	1
Lithium	61.2		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:29	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	103		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:09	1
Calcium	118000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:09	1
Lithium	80.0		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:43	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	185		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:24	1
Calcium	184000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:24	1
Lithium	59.7		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:47	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	184		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:27	1
Calcium	152000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:27	1
Lithium	58.1		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:51	1

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3630		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:31	1
Calcium	470000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:31	1
Lithium	125		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:55	1

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	327		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:35	1
Calcium	728000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:35	1
Lithium	76.9		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 18:59	1

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3700		100	1.45	ug/L		06/07/24 08:24	06/08/24 00:39	1
Calcium	475000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:39	1
Lithium	124		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 19:03	1

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	69.6	J	100	1.45	ug/L		06/07/24 08:24	06/08/24 00:43	1
Calcium	109000	B	200	24.1	ug/L		06/07/24 08:24	06/08/24 00:43	1
Lithium	30.4		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 19:07	1

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	1.45	ug/L		06/06/24 17:11	06/10/24 21:09	1
Calcium	97.7	J B	200	24.1	ug/L		06/06/24 17:11	06/10/24 21:09	1
Lithium	ND		20.0	9.10	ug/L		06/06/24 17:11	06/13/24 15:57	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	68.1	J	100	1.45	ug/L		06/06/24 17:11	06/10/24 21:05	1
Calcium	129000	B	200	24.1	ug/L		06/06/24 17:11	06/10/24 21:05	1
Lithium	33.8		20.0	9.10	ug/L		06/06/24 17:11	06/13/24 15:52	1

Method: SW846 6020B - Metals (ICP/MS)

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.13	J	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:01	1
Barium	77.1		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:01	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:01	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:01	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:01	1
Chromium	5.80		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:01	1
Molybdenum	5.88		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:01	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:01	1
Antimony	1.23	J	2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:01	1
Selenium	5.32		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:01	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:01	1

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	3.32	J	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:04	1
Barium	48.6		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:04	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:04	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:04	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:04	1
Chromium	1.44	J	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:04	1
Molybdenum	7.25		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:04	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:04	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:04	1
Selenium	8.04		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:04	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:04	1

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	2.67	J	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:08	1
Barium	54.6		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:08	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:08	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:08	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:08	1
Chromium	4.75		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:08	1
Molybdenum	7.34		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:08	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:08	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:08	1
Selenium	**5.14**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:08	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:08	1

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.24**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:11	1
Barium	**58.9**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:11	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:11	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:11	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:11	1
Chromium	**1.50**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:11	1
Molybdenum	**8.93**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:11	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:11	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:11	1
Selenium	**3.40**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:11	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:11	1

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.56**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:15	1
Barium	**35.3**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:15	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:15	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:15	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:15	1
Chromium	**3.66**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:15	1
Molybdenum	**43.6**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:15	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:15	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:15	1
Selenium	**9.69**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:15	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:15	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.78**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:18	1
Barium	**24.1**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:18	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:18	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:18	1
Cobalt	**0.648**	**J**	1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:18	1
Chromium	**5.78**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:18	1
Molybdenum	**87.4**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:18	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:18	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:18	1
Selenium	**6.48**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:18	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:18	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.43**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:22	1
Barium	**70.4**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:22	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:22	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:22	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:22	1
Chromium	**3.19**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:22	1
Molybdenum	**40.2**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:22	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:22	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:22	1
Selenium	**6.33**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:22	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:22	1

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.96**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:25	1
Barium	**33.5**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:25	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:25	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:25	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:25	1
Chromium	**0.530**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:25	1
Molybdenum	**3.57**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:25	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:25	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:25	1
Selenium	**1.03**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:25	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:25	1

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.29**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:36	1
Barium	**36.2**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:36	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:36	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:36	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:36	1
Chromium	**0.821**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:36	1
Molybdenum	**2.75**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:36	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:36	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:36	1
Selenium	**2.48**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:36	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:36	1

Method: SW846 6020B - Metals (ICP/MS)

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.91**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:40	1
Barium	**53.9**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:40	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:40	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:40	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:40	1
Chromium	**6.20**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:40	1
Molybdenum	**12.1**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:40	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:40	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:40	1
Selenium	**20.1**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:40	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:40	1

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.82**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:43	1
Barium	**58.8**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 00:43	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 00:43	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 00:43	1
Cobalt	ND	F1	1.00	0.330	ug/L		06/07/24 08:24	06/12/24 00:43	1
Chromium	**0.522**	**J F1**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 00:43	1
Molybdenum	**8.50**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 00:43	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 00:43	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 00:43	1
Selenium	**3.04**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 00:43	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 00:43	1

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.99**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:01	1
Barium	**71.3**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:01	1
Beryllium	**0.492**	**J**	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:01	1
Cadmium	**0.242**	**J**	1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:01	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:01	1
Chromium	**1.25**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:01	1
Molybdenum	**8.19**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:01	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:01	1
Antimony	**2.73**		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:01	1
Selenium	**7.09**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:01	1
Thallium	**0.220**	**J**	1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:01	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.06**		5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:04	1
Barium	**29.4**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:04	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:04	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:04	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:04	1
Chromium	**0.658**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:04	1
Molybdenum	**5.48**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:04	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:04	1
Antimony	**0.703**	**J**	2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:04	1
Selenium	**4.70**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:04	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:04	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.51**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:15	1
Barium	**255**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:15	1
Beryllium	**0.911**	**J**	1.00	0.303	ug/L		06/07/24 08:24	06/14/24 10:42	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:15	1
Cobalt	**7.35**		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:15	1
Chromium	**18.5**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:15	1
Molybdenum	**9.29**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:15	1
Lead	**8.11**		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:15	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:15	1
Selenium	**1.03**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:15	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:15	1

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.03**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:19	1
Barium	**100**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:19	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/14/24 10:46	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:19	1
Cobalt	**2.01**		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:19	1
Chromium	**3.69**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:19	1
Molybdenum	**4.14**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:19	1
Lead	**1.25**		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:19	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:19	1
Selenium	**2.03**	**J**	5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:19	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:19	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.36**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:22	1
Barium	**64.0**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:22	1
Beryllium	ND	^+	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:22	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:22	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:22	1
Chromium	**0.987**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:22	1
Molybdenum	**3.84**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:22	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:22	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:22	1
Selenium	ND		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:22	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:22	1

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.05**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:26	1
Barium	**16.7**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:26	1
Beryllium	ND	^+	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:26	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:26	1
Cobalt	**0.499**	**J**	1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:26	1
Chromium	**5.85**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:26	1
Molybdenum	**198**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:26	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:26	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:26	1
Selenium	**5.00**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:26	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:26	1

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.60**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:29	1
Barium	**51.8**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:29	1
Beryllium	ND	^+	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:29	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:29	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:29	1
Chromium	**4.43**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:29	1
Molybdenum	**87.4**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:29	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:29	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:29	1
Selenium	**12.4**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:29	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:29	1

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.75**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:33	1
Barium	**17.5**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:33	1
Beryllium	ND	^+	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:33	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:33	1
Cobalt	**0.507**	**J**	1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:33	1
Chromium	**6.10**		3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:33	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	**196**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:33	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:33	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:33	1
Selenium	**5.17**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:33	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:33	1

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.94**	**J**	5.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:36	1
Barium	**51.5**		3.00	0.380	ug/L		06/07/24 08:24	06/12/24 01:36	1
Beryllium	ND	^+	1.00	0.303	ug/L		06/07/24 08:24	06/12/24 01:36	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/12/24 01:36	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/12/24 01:36	1
Chromium	**0.959**	**J**	3.00	0.500	ug/L		06/07/24 08:24	06/12/24 01:36	1
Molybdenum	**6.54**		2.00	0.370	ug/L		06/07/24 08:24	06/12/24 01:36	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/12/24 01:36	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/12/24 01:36	1
Selenium	**7.17**		5.00	1.00	ug/L		06/07/24 08:24	06/12/24 01:36	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/12/24 01:36	1

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		06/18/24 20:44	06/19/24 22:03	1
Barium	ND		3.00	0.380	ug/L		06/18/24 20:44	06/19/24 22:03	1
Beryllium	ND		1.00	0.303	ug/L		06/18/24 20:44	06/19/24 22:03	1
Cadmium	ND		1.00	0.190	ug/L		06/18/24 20:44	06/19/24 22:03	1
Cobalt	ND		1.00	0.330	ug/L		06/18/24 20:44	06/19/24 22:03	1
Chromium	ND		3.00	0.500	ug/L		06/18/24 20:44	06/19/24 22:03	1
Molybdenum	ND		2.00	0.370	ug/L		06/18/24 20:44	06/19/24 22:03	1
Lead	ND		1.00	0.230	ug/L		06/18/24 20:44	06/19/24 22:03	1
Antimony	ND		2.00	0.400	ug/L		06/18/24 20:44	06/19/24 22:03	1
Selenium	ND		5.00	1.00	ug/L		06/18/24 20:44	06/19/24 22:03	1
Thallium	ND		1.00	0.210	ug/L		06/18/24 20:44	06/19/24 22:03	1

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.57**	**J**	5.00	0.500	ug/L		06/06/24 17:11	06/10/24 21:28	1
Barium	**72.1**		3.00	0.380	ug/L		06/06/24 17:11	06/10/24 21:28	1
Beryllium	ND		1.00	0.303	ug/L		06/06/24 17:11	06/10/24 21:28	1
Cadmium	ND		1.00	0.190	ug/L		06/06/24 17:11	06/10/24 21:28	1
Cobalt	ND		1.00	0.330	ug/L		06/06/24 17:11	06/10/24 21:28	1
Chromium	**16.9**	**B**	3.00	0.500	ug/L		06/06/24 17:11	06/10/24 21:28	1
Molybdenum	**4.21**		2.00	0.370	ug/L		06/06/24 17:11	06/10/24 21:28	1
Lead	ND		1.00	0.230	ug/L		06/06/24 17:11	06/10/24 21:28	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.400	ug/L		06/06/24 17:11	06/10/24 21:28	1
Selenium	**4.00**	**J**	5.00	1.00	ug/L		06/06/24 17:11	06/10/24 21:28	1
Thallium	ND		1.00	0.210	ug/L		06/06/24 17:11	06/10/24 21:28	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:23	1

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:26	1

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:28	1

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:31	1

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:33	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:36	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:38	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:41	1

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:49	1

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:51	1

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:54	1

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:01	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:04	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:06	1

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:09	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:11	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:19	1

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:22	1

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:24	1

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 01:27	1

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 19:26	06/14/24 02:43	1

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 19:26	06/14/24 02:50	1

General Chemistry

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	35.5		3.00	1.02	mg/L			06/07/24 17:16	1
Fluoride (SW846 9056A)	0.476	J	0.500	0.165	mg/L			06/07/24 17:16	1
Sulfate (SW846 9056A)	312		25.0	5.15	mg/L			06/07/24 17:27	5
Total Dissolved Solids (TDS) (SM 2540C)	796		10.0	4.70	mg/L			06/07/24 10:26	1

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	51.8		3.00	1.02	mg/L			06/07/24 17:39	1
Fluoride (SW846 9056A)	0.858		0.500	0.165	mg/L			06/07/24 17:39	1
Sulfate (SW846 9056A)	363		25.0	5.15	mg/L			06/07/24 17:50	5

General Chemistry (Continued)

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS) (SM 2540C)	936		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	61.7		3.00	1.02	mg/L			06/08/24 04:38	1
Fluoride (SW846 9056A)	0.383	J	0.500	0.165	mg/L			06/08/24 04:38	1
Sulfate (SW846 9056A)	450		25.0	5.15	mg/L			06/08/24 04:49	5
Total Dissolved Solids (TDS) (SM 2540C)	1170		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	134		3.00	1.02	mg/L			06/07/24 18:01	1
Fluoride (SW846 9056A)	0.598		0.500	0.165	mg/L			06/07/24 18:01	1
Sulfate (SW846 9056A)	782		50.0	10.3	mg/L			06/07/24 18:12	10
Total Dissolved Solids (TDS) (SM 2540C)	1630		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	327		60.0	20.4	mg/L			06/07/24 18:34	20
Fluoride (SW846 9056A)	2.04		0.500	0.165	mg/L			06/07/24 18:23	1
Sulfate (SW846 9056A)	2470		100	20.6	mg/L			06/07/24 18:34	20
Total Dissolved Solids (TDS) (SM 2540C)	4150		40.0	18.8	mg/L			06/07/24 10:26	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	72.4		3.00	1.02	mg/L			06/07/24 19:06	1
Fluoride (SW846 9056A)	0.592		0.500	0.165	mg/L			06/07/24 19:06	1
Sulfate (SW846 9056A)	579		50.0	10.3	mg/L			06/07/24 19:17	10
Total Dissolved Solids (TDS) (SM 2540C)	1290		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	81.8		3.00	1.02	mg/L			06/08/24 03:54	1
Fluoride (SW846 9056A)	0.407	J	0.500	0.165	mg/L			06/08/24 03:54	1
Sulfate (SW846 9056A)	514		50.0	10.3	mg/L			06/08/24 04:05	10
Total Dissolved Solids (TDS) (SM 2540C)	1220		20.0	9.40	mg/L			06/07/24 10:26	1

General Chemistry

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	48.8		3.00	1.02	mg/L			06/07/24 19:28	1
Fluoride (SW846 9056A)	0.521		0.500	0.165	mg/L			06/07/24 19:28	1
Sulfate (SW846 9056A)	566		25.0	5.15	mg/L			06/07/24 19:39	5
Total Dissolved Solids (TDS) (SM 2540C)	1360		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	125		3.00	1.02	mg/L			06/07/24 19:50	1
Fluoride (SW846 9056A)	0.502		0.500	0.165	mg/L			06/07/24 19:50	1
Sulfate (SW846 9056A)	1050		100	20.6	mg/L			06/07/24 20:01	20
Total Dissolved Solids (TDS) (SM 2540C)	2180		20.0	9.40	mg/L			06/07/24 10:26	1

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	93.8		3.00	1.02	mg/L			06/07/24 20:12	1
Fluoride (SW846 9056A)	0.335	J	0.500	0.165	mg/L			06/07/24 20:12	1
Sulfate (SW846 9056A)	428		25.0	5.15	mg/L			06/07/24 20:23	5
Total Dissolved Solids (TDS) (SM 2540C)	1040		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	47.6		3.00	1.02	mg/L			06/07/24 20:34	1
Fluoride (SW846 9056A)	0.712		0.500	0.165	mg/L			06/07/24 20:34	1
Sulfate (SW846 9056A)	379		25.0	5.15	mg/L			06/07/24 21:18	5
Total Dissolved Solids (TDS) (SM 2540C)	930		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	45.9		3.00	1.02	mg/L			06/07/24 22:24	1
Fluoride (SW846 9056A)	0.637		0.500	0.165	mg/L			06/07/24 22:24	1
Sulfate (SW846 9056A)	376		25.0	5.15	mg/L			06/07/24 22:35	5
Total Dissolved Solids (TDS) (SM 2540C)	920		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	32.8		3.00	1.02	mg/L			06/07/24 22:46	1
Fluoride (SW846 9056A)	0.845		0.500	0.165	mg/L			06/07/24 22:46	1

General Chemistry (Continued)

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate (SW846 9056A)	315		25.0	5.15	mg/L			06/07/24 22:57	5
Total Dissolved Solids (TDS) (SM 2540C)	904		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	33.1		3.00	1.02	mg/L			06/08/24 04:59	1
Fluoride (SW846 9056A)	0.771		0.500	0.165	mg/L			06/08/24 04:59	1
Sulfate (SW846 9056A)	171		5.00	1.03	mg/L			06/08/24 04:59	1
Total Dissolved Solids (TDS) (SM 2540C)	527		10.0	4.70	mg/L			06/10/24 09:53	1

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	48.8		3.00	1.02	mg/L			06/08/24 05:21	1
Fluoride (SW846 9056A)	0.298	J	0.500	0.165	mg/L			06/08/24 05:21	1
Sulfate (SW846 9056A)	477		25.0	5.15	mg/L			06/08/24 05:32	5
Total Dissolved Solids (TDS) (SM 2540C)	1100		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	33.3		3.00	1.02	mg/L			06/08/24 06:05	1
Fluoride (SW846 9056A)	0.483	J	0.500	0.165	mg/L			06/08/24 06:05	1
Sulfate (SW846 9056A)	395		25.0	5.15	mg/L			06/08/24 06:16	5
Total Dissolved Solids (TDS) (SM 2540C)	926		20.0	9.40	mg/L			06/10/24 09:53	1

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	261		60.0	20.4	mg/L			06/08/24 00:03	20
Fluoride (SW846 9056A)	1.12		0.500	0.165	mg/L			06/07/24 23:52	1
Sulfate (SW846 9056A)	5150		250	51.5	mg/L			06/13/24 23:53	50
Total Dissolved Solids (TDS) (SM 2540C)	8490		100	47.0	mg/L			06/10/24 09:53	1

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	648		60.0	20.4	mg/L			06/08/24 00:47	20
Fluoride (SW846 9056A)	2.80		0.500	0.165	mg/L			06/08/24 00:36	1
Sulfate (SW846 9056A)	1910		100	20.6	mg/L			06/08/24 00:47	20

General Chemistry (Continued)

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS) (SM 2540C)	4000		40.0	18.8	mg/L			06/10/24 09:55	1

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	264		60.0	20.4	mg/L			06/08/24 01:09	20
Fluoride (SW846 9056A)	1.15		0.500	0.165	mg/L			06/08/24 00:58	1
Sulfate (SW846 9056A)	4560		250	51.5	mg/L			06/13/24 23:09	50
Total Dissolved Solids (TDS) (SM 2540C)	8370		100	47.0	mg/L			06/10/24 09:55	1

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	30.3		3.00	1.02	mg/L			06/07/24 23:08	1
Fluoride (SW846 9056A)	0.589		0.500	0.165	mg/L			06/07/24 23:08	1
Sulfate (SW846 9056A)	198		50.0	10.3	mg/L			06/14/24 01:53	10
Total Dissolved Solids (TDS) (SM 2540C)	673		10.0	4.70	mg/L			06/10/24 09:55	1

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	ND		3.00	1.02	mg/L			06/08/24 01:20	1
Fluoride (SW846 9056A)	ND		0.500	0.165	mg/L			06/08/24 01:20	1
Sulfate (SW846 9056A)	ND		5.00	1.03	mg/L			06/08/24 01:20	1
Total Dissolved Solids (TDS) (SM 2540C)	11.0		10.0	4.70	mg/L			06/10/24 09:55	1

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	58.9		3.00	1.02	mg/L			06/07/24 23:30	1
Fluoride (SW846 9056A)	0.650		0.500	0.165	mg/L			06/07/24 23:30	1
Sulfate (SW846 9056A)	338		25.0	5.15	mg/L			06/07/24 23:41	5
Total Dissolved Solids (TDS) (SM 2540C)	827		10.0	4.70	mg/L			06/10/24 09:55	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 280-656144/1-A
Matrix: Water
Analysis Batch: 656427

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656144

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	1.45	ug/L		06/07/24 08:24	06/07/24 22:44	1
Calcium	26.17	J	200	24.1	ug/L		06/07/24 08:24	06/07/24 22:44	1

Lab Sample ID: MB 280-656144/1-A
Matrix: Water
Analysis Batch: 656569

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656144

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		20.0	9.10	ug/L		06/07/24 08:24	06/10/24 17:08	1

Lab Sample ID: LCS 280-656144/2-A
Matrix: Water
Analysis Batch: 656427

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	2018		ug/L		101	86 - 110
Calcium	50000	51090		ug/L		102	90 - 111

Lab Sample ID: LCS 280-656144/2-A
Matrix: Water
Analysis Batch: 656569

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	1000	998.8		ug/L		100	90 - 112

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 656427

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	234		2000	2353		ug/L		106	87 - 113
Calcium	140000	B	50000	192700		ug/L		105	75 - 125

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 656569

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	43.3		1000	1057		ug/L		101	89 - 114

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 656427

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	234		2000	2338		ug/L		105	87 - 113	1	20
Calcium	140000	B	50000	196200		ug/L		112	75 - 125	2	20

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 656569

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Lithium	43.3		1000	1048		ug/L		101	89 - 114	1	20

Lab Sample ID: MB 280-656150/1-A
Matrix: Water
Analysis Batch: 656568

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656150

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	1.45	ug/L		06/06/24 17:11	06/10/24 20:43	1
Calcium	37.45	J	200	24.1	ug/L		06/06/24 17:11	06/10/24 20:43	1

Lab Sample ID: MB 280-656150/1-A
Matrix: Water
Analysis Batch: 657037

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656150

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lithium	ND		20.0	9.10	ug/L		06/06/24 17:11	06/13/24 15:44	1

Lab Sample ID: LCS 280-656150/2-A
Matrix: Water
Analysis Batch: 656568

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656150

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	2111		ug/L		106	86 - 110
Calcium	50000	51170		ug/L		102	90 - 111

Lab Sample ID: LCS 280-656150/2-A
Matrix: Water
Analysis Batch: 657037

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656150

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Lithium	1000	1002		ug/L		100	90 - 112

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 280-656144/1-A
Matrix: Water
Analysis Batch: 656703

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656144

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		06/07/24 08:24	06/11/24 23:54	1
Barium	ND		3.00	0.380	ug/L		06/07/24 08:24	06/11/24 23:54	1
Beryllium	ND		1.00	0.303	ug/L		06/07/24 08:24	06/11/24 23:54	1
Cadmium	ND		1.00	0.190	ug/L		06/07/24 08:24	06/11/24 23:54	1
Cobalt	ND		1.00	0.330	ug/L		06/07/24 08:24	06/11/24 23:54	1
Chromium	ND		3.00	0.500	ug/L		06/07/24 08:24	06/11/24 23:54	1
Molybdenum	ND		2.00	0.370	ug/L		06/07/24 08:24	06/11/24 23:54	1
Lead	ND		1.00	0.230	ug/L		06/07/24 08:24	06/11/24 23:54	1
Antimony	ND		2.00	0.400	ug/L		06/07/24 08:24	06/11/24 23:54	1
Selenium	ND		5.00	1.00	ug/L		06/07/24 08:24	06/11/24 23:54	1
Thallium	ND		1.00	0.210	ug/L		06/07/24 08:24	06/11/24 23:54	1

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: LCS 280-656144/25-A
Matrix: Water
Analysis Batch: 656703

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	40.0	40.15		ug/L		100	85 - 117
Barium	40.0	41.05		ug/L		103	85 - 118
Beryllium	40.0	39.18		ug/L		98	80 - 125
Cadmium	40.0	38.64		ug/L		97	85 - 115
Cobalt	40.0	38.58		ug/L		96	85 - 120
Chromium	40.0	38.52		ug/L		96	84 - 121
Molybdenum	40.0	38.81		ug/L		97	85 - 119
Lead	40.0	40.23		ug/L		101	85 - 118
Antimony	40.0	40.41		ug/L		101	85 - 115
Selenium	40.0	39.01		ug/L		98	77 - 122
Thallium	40.0	39.05		ug/L		98	85 - 118

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 656703

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	2.82	J	40.0	43.54		ug/L		102	92 - 112
Barium	58.8		40.0	101.2		ug/L		106	92 - 117
Beryllium	ND		40.0	40.72		ug/L		102	87 - 118
Cadmium	ND		40.0	37.62		ug/L		94	91 - 114
Cobalt	ND	F1	40.0	36.14	F1	ug/L		90	94 - 115
Chromium	0.522	J F1	40.0	36.51	F1	ug/L		90	91 - 114
Molybdenum	8.50		40.0	47.08		ug/L		96	84 - 117
Lead	ND		40.0	39.31		ug/L		98	95 - 116
Antimony	ND		40.0	42.57		ug/L		106	80 - 111
Selenium	3.04	J	40.0	41.89		ug/L		97	90 - 115
Thallium	ND		40.0	38.53		ug/L		96	94 - 115

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 656703

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656144

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	2.82	J	40.0	43.61		ug/L		102	92 - 112	0	20
Barium	58.8		40.0	101.4		ug/L		106	92 - 117	0	20
Beryllium	ND		40.0	42.45		ug/L		106	87 - 118	4	20
Cadmium	ND		40.0	38.05		ug/L		95	91 - 114	1	20
Cobalt	ND	F1	40.0	36.30	F1	ug/L		91	94 - 115	0	20
Chromium	0.522	J F1	40.0	36.57	F1	ug/L		90	91 - 114	0	20
Molybdenum	8.50		40.0	47.76		ug/L		98	84 - 117	1	20
Lead	ND		40.0	39.46		ug/L		99	95 - 116	0	20
Antimony	ND		40.0	43.20		ug/L		108	80 - 111	1	20
Selenium	3.04	J	40.0	44.79		ug/L		104	90 - 115	7	20
Thallium	ND		40.0	38.92		ug/L		97	94 - 115	1	20

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

Lab Sample ID: MB 280-656150/1-A
Matrix: Water
Analysis Batch: 656522

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656150

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		06/06/24 17:11	06/10/24 21:23	1
Barium	ND		3.00	0.380	ug/L		06/06/24 17:11	06/10/24 21:23	1
Beryllium	ND		1.00	0.303	ug/L		06/06/24 17:11	06/10/24 21:23	1
Cadmium	ND		1.00	0.190	ug/L		06/06/24 17:11	06/10/24 21:23	1
Cobalt	ND		1.00	0.330	ug/L		06/06/24 17:11	06/10/24 21:23	1
Chromium	1.180	J	3.00	0.500	ug/L		06/06/24 17:11	06/10/24 21:23	1
Molybdenum	ND		2.00	0.370	ug/L		06/06/24 17:11	06/10/24 21:23	1
Lead	ND		1.00	0.230	ug/L		06/06/24 17:11	06/10/24 21:23	1
Antimony	ND		2.00	0.400	ug/L		06/06/24 17:11	06/10/24 21:23	1
Selenium	ND		5.00	1.00	ug/L		06/06/24 17:11	06/10/24 21:23	1
Thallium	ND		1.00	0.210	ug/L		06/06/24 17:11	06/10/24 21:23	1

Lab Sample ID: LCS 280-656150/23-A
Matrix: Water
Analysis Batch: 656522

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656150

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	40.0	39.76		ug/L		99	85 - 117
Barium	40.0	39.65		ug/L		99	85 - 118
Beryllium	40.0	39.64		ug/L		99	80 - 125
Cadmium	40.0	38.92		ug/L		97	85 - 115
Cobalt	40.0	39.07		ug/L		98	85 - 120
Chromium	40.0	39.71		ug/L		99	84 - 121
Molybdenum	40.0	39.02		ug/L		98	85 - 119
Lead	40.0	38.02		ug/L		95	85 - 118
Antimony	40.0	39.05		ug/L		98	85 - 115
Selenium	40.0	39.64		ug/L		99	77 - 122
Thallium	40.0	38.29		ug/L		96	85 - 118

Lab Sample ID: MB 280-657489/1-A
Matrix: Water
Analysis Batch: 657669

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 657489

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		06/18/24 20:44	06/19/24 21:22	1
Barium	ND		3.00	0.380	ug/L		06/18/24 20:44	06/19/24 21:22	1
Beryllium	ND		1.00	0.303	ug/L		06/18/24 20:44	06/19/24 21:22	1
Cadmium	ND		1.00	0.190	ug/L		06/18/24 20:44	06/19/24 21:22	1
Cobalt	ND		1.00	0.330	ug/L		06/18/24 20:44	06/19/24 21:22	1
Chromium	ND		3.00	0.500	ug/L		06/18/24 20:44	06/19/24 21:22	1
Molybdenum	ND		2.00	0.370	ug/L		06/18/24 20:44	06/19/24 21:22	1
Lead	ND		1.00	0.230	ug/L		06/18/24 20:44	06/19/24 21:22	1
Antimony	ND		2.00	0.400	ug/L		06/18/24 20:44	06/19/24 21:22	1
Selenium	ND		5.00	1.00	ug/L		06/18/24 20:44	06/19/24 21:22	1
Thallium	ND		1.00	0.210	ug/L		06/18/24 20:44	06/19/24 21:22	1

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

Lab Sample ID: LCS 280-657489/16-A
Matrix: Water
Analysis Batch: 657669

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 657489

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	40.0	36.14		ug/L		90	85 - 117
Barium	40.0	37.78		ug/L		94	85 - 118
Beryllium	40.0	35.90		ug/L		90	80 - 125
Cadmium	40.0	36.45		ug/L		91	85 - 115
Cobalt	40.0	35.58		ug/L		89	85 - 120
Chromium	40.0	35.80		ug/L		90	84 - 121
Molybdenum	40.0	37.79		ug/L		94	85 - 119
Lead	40.0	37.85		ug/L		95	85 - 118
Antimony	40.0	38.22		ug/L		96	85 - 115
Selenium	40.0	39.21		ug/L		98	77 - 122
Thallium	40.0	36.47		ug/L		91	85 - 118

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-656992/1-A
Matrix: Water
Analysis Batch: 657128

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656992

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 17:16	06/14/24 00:18	1

Lab Sample ID: LCS 280-656992/2-A
Matrix: Water
Analysis Batch: 657128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656992

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.005007		mg/L		100	84 - 120

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 657128

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656992

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		0.00500	0.004985		mg/L		100	75 - 125

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 657128

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 656992

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		0.00500	0.005049		mg/L		101	75 - 125	1	20

Lab Sample ID: MB 280-656994/1-A
Matrix: Water
Analysis Batch: 657128

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 656994

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		06/13/24 19:26	06/14/24 02:38	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 280-656994/2-A
Matrix: Water
Analysis Batch: 657128

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 656994

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.005155		mg/L		103	84 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-656218/6
Matrix: Water
Analysis Batch: 656218

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			06/07/24 14:17	1
Fluoride	ND		0.500	0.165	mg/L			06/07/24 14:17	1
Sulfate	ND		5.00	1.03	mg/L			06/07/24 14:17	1

Lab Sample ID: MB 280-656218/61
Matrix: Water
Analysis Batch: 656218

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			06/08/24 02:15	1
Fluoride	ND		0.500	0.165	mg/L			06/08/24 02:15	1
Sulfate	ND		5.00	1.03	mg/L			06/08/24 02:15	1

Lab Sample ID: LCS 280-656218/4
Matrix: Water
Analysis Batch: 656218

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	100	99.95		mg/L		100	90 - 110
Fluoride	5.00	4.729		mg/L		95	90 - 110
Sulfate	100	100.1		mg/L		100	90 - 110

Lab Sample ID: LCS 280-656218/59
Matrix: Water
Analysis Batch: 656218

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	100	100.3		mg/L		100	90 - 110
Fluoride	5.00	4.686		mg/L		94	90 - 110
Sulfate	100	100.5		mg/L		101	90 - 110

Lab Sample ID: LCSD 280-656218/5
Matrix: Water
Analysis Batch: 656218

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	100	99.89		mg/L		100	90 - 110	0	10
Fluoride	5.00	4.674		mg/L		93	90 - 110	1	10
Sulfate	100	100.1		mg/L		100	90 - 110	0	10

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

Lab Sample ID: LCSD 280-656218/60
Matrix: Water
Analysis Batch: 656218

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			100	100.3		mg/L		100	90 - 110	0	10
Fluoride			5.00	4.640		mg/L		93	90 - 110	1	10
Sulfate			100	99.99		mg/L		100	90 - 110	1	10

Lab Sample ID: MRL 280-656218/3
Matrix: Water
Analysis Batch: 656218

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

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			5.00	4.710		mg/L		94	50 - 150		
Fluoride			0.500	0.4019	J	mg/L		80	50 - 150		
Sulfate			5.00	4.659	J	mg/L		93	50 - 150		

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	47.6		50.0	99.26		mg/L		103	80 - 120		
Fluoride	0.712		5.00	5.777		mg/L		101	80 - 120		

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate	379		250	635.3		mg/L		103	80 - 120		

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	47.6		50.0	100.3		mg/L		106	80 - 120	1	20
Fluoride	0.712		5.00	5.891		mg/L		104	80 - 120	2	20

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate	379		250	642.6		mg/L		106	80 - 120	1	20

Lab Sample ID: 280-192407-11 DU
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	47.6		47.41		mg/L		0.3	15
Fluoride	0.712		0.7088		mg/L		0.5	15

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: 280-192407-11 DU
Matrix: Water
Analysis Batch: 656218

Client Sample ID: MW-20B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Sulfate	379			373.3		mg/L				1	15

Lab Sample ID: MB 280-656899/46
Matrix: Water
Analysis Batch: 656899

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			06/13/24 23:42	1
Fluoride	ND		0.500	0.165	mg/L			06/13/24 23:42	1
Sulfate	ND		5.00	1.03	mg/L			06/13/24 23:42	1

Lab Sample ID: MB 280-656899/6
Matrix: Water
Analysis Batch: 656899

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			06/13/24 11:33	1
Fluoride	ND		0.500	0.165	mg/L			06/13/24 11:33	1
Sulfate	ND		5.00	1.03	mg/L			06/13/24 11:33	1

Lab Sample ID: LCS 280-656899/4
Matrix: Water
Analysis Batch: 656899

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			100	99.50		mg/L		99	90 - 110		
Fluoride			5.00	4.760		mg/L		95	90 - 110		
Sulfate			100	99.37		mg/L		99	90 - 110		

Lab Sample ID: LCS 280-656899/44
Matrix: Water
Analysis Batch: 656899

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			100	99.61		mg/L		100	90 - 110		
Fluoride			5.00	4.896		mg/L		98	90 - 110		
Sulfate			100	100.1		mg/L		100	90 - 110		

Lab Sample ID: LCSD 280-656899/45
Matrix: Water
Analysis Batch: 656899

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			100	99.67		mg/L		100	90 - 110	0	10
Fluoride			5.00	4.865		mg/L		97	90 - 110	1	10
Sulfate			100	100.1		mg/L		100	90 - 110	0	10

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

Lab Sample ID: LCSD 280-656899/5
Matrix: Water
Analysis Batch: 656899

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			100	99.74		mg/L		100	90 - 110	0	10
Fluoride			5.00	4.764		mg/L		95	90 - 110	0	10
Sulfate			100	99.57		mg/L		100	90 - 110	0	10

Lab Sample ID: MRL 280-656899/3
Matrix: Water
Analysis Batch: 656899

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

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			5.00	4.818		mg/L		96	50 - 150		
Fluoride			0.500	0.4009	J	mg/L		80	50 - 150		
Sulfate			5.00	4.659	J	mg/L		93	50 - 150		

Lab Sample ID: 280-192407-17 MS
Matrix: Water
Analysis Batch: 656899

Client Sample ID: MW-38B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	245		2500	2656		mg/L		96	80 - 120		
Fluoride	ND		250	239.4		mg/L		96	80 - 120		
Sulfate	5150		2500	7650		mg/L		100	80 - 120		

Lab Sample ID: 280-192407-17 MSD
Matrix: Water
Analysis Batch: 656899

Client Sample ID: MW-38B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	245		2500	2723		mg/L		99	80 - 120	2	20
Fluoride	ND		250	246.3		mg/L		99	80 - 120	3	20
Sulfate	5150		2500	7833		mg/L		107	80 - 120	2	20

Lab Sample ID: 280-192407-17 DU
Matrix: Water
Analysis Batch: 656899

Client Sample ID: MW-38B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Chloride	245			251.9		mg/L				3	15
Fluoride	ND			ND		mg/L				NC	15
Sulfate	5150			5307		mg/L				3	15

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

Lab Sample ID: MB 280-656228/1
Matrix: Water
Analysis Batch: 656228

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			06/07/24 10:26	1

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

Lab Sample ID: LCS 280-656228/2
Matrix: Water
Analysis Batch: 656228

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			501	500.0		mg/L		100	88 - 114		

Lab Sample ID: MB 280-656409/1
Matrix: Water
Analysis Batch: 656409

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			06/10/24 09:53	1

Lab Sample ID: LCS 280-656409/2
Matrix: Water
Analysis Batch: 656409

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			501	494.0		mg/L		99	88 - 114		

Lab Sample ID: 280-192407-17 DU
Matrix: Water
Analysis Batch: 656409

Client Sample ID: MW-38B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids (TDS)	8490			8530		mg/L				0.5	10

Lab Sample ID: MB 280-656410/1
Matrix: Water
Analysis Batch: 656410

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			06/10/24 09:55	1

Lab Sample ID: LCS 280-656410/2
Matrix: Water
Analysis Batch: 656410

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			501	506.0		mg/L		101	88 - 114		

Lab Sample ID: 280-192407-18 DU
Matrix: Water
Analysis Batch: 656410

Client Sample ID: MW-21B
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Total Dissolved Solids (TDS)	4000			3868		mg/L				3	10

Metals

Prep Batch: 656144

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	3020A	
280-192407-2	MW-45B	Total/NA	Water	3020A	
280-192407-3	MW-44B	Total/NA	Water	3020A	
280-192407-4	MW-43B	Total/NA	Water	3020A	
280-192407-5	MW-42B	Total/NA	Water	3020A	
280-192407-6	MW-41B	Total/NA	Water	3020A	
280-192407-7	MW-37B	Total/NA	Water	3020A	
280-192407-8	MW-39B	Total/NA	Water	3020A	
280-192407-9	MW-32B	Total/NA	Water	3020A	
280-192407-10	MW-14B	Total/NA	Water	3020A	
280-192407-11	MW-20B	Total/NA	Water	3010A	
280-192407-11	MW-20B	Total/NA	Water	3020A	
280-192407-12	MW-36B	Total/NA	Water	3020A	
280-192407-13	MW-40B	Total/NA	Water	3020A	
280-192407-14	MW-53B2	Total/NA	Water	3020A	
280-192407-15	MW-52B	Total/NA	Water	3020A	
280-192407-16	MW-49B	Total/NA	Water	3020A	
280-192407-17	MW-38B	Total/NA	Water	3020A	
280-192407-18	MW-21B	Total/NA	Water	3020A	
280-192407-19	Dup-01	Total/NA	Water	3020A	
280-192407-20	MW-38C	Total/NA	Water	3020A	
MB 280-656144/1-A	Method Blank	Total/NA	Water	3010A	
LCS 280-656144/25-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 280-656144/2-A	Lab Control Sample	Total/NA	Water	3010A	
280-192407-11 MS	MW-20B	Total/NA	Water	3010A	
280-192407-11 MS	MW-20B	Total/NA	Water	3020A	
280-192407-11 MSD	MW-20B	Total/NA	Water	3010A	
280-192407-11 MSD	MW-20B	Total/NA	Water	3020A	

Prep Batch: 656150

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	3020A	
280-192407-22	MW-46B	Total/NA	Water	3020A	
MB 280-656150/1-A	Method Blank	Total/NA	Water	3010A	
LCS 280-656150/23-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 280-656150/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 656427

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	6010D	656144
280-192407-2	MW-45B	Total/NA	Water	6010D	656144
280-192407-3	MW-44B	Total/NA	Water	6010D	656144
280-192407-4	MW-43B	Total/NA	Water	6010D	656144
280-192407-5	MW-42B	Total/NA	Water	6010D	656144
280-192407-6	MW-41B	Total/NA	Water	6010D	656144
280-192407-7	MW-37B	Total/NA	Water	6010D	656144
280-192407-8	MW-39B	Total/NA	Water	6010D	656144
280-192407-9	MW-32B	Total/NA	Water	6010D	656144
280-192407-10	MW-14B	Total/NA	Water	6010D	656144
280-192407-11	MW-20B	Total/NA	Water	6010D	656144
280-192407-12	MW-36B	Total/NA	Water	6010D	656144

Metals (Continued)

Analysis Batch: 656427 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-13	MW-40B	Total/NA	Water	6010D	656144
280-192407-14	MW-53B2	Total/NA	Water	6010D	656144
280-192407-15	MW-52B	Total/NA	Water	6010D	656144
280-192407-16	MW-49B	Total/NA	Water	6010D	656144
280-192407-17	MW-38B	Total/NA	Water	6010D	656144
280-192407-18	MW-21B	Total/NA	Water	6010D	656144
280-192407-19	Dup-01	Total/NA	Water	6010D	656144
280-192407-20	MW-38C	Total/NA	Water	6010D	656144
MB 280-656144/1-A	Method Blank	Total/NA	Water	6010D	656144
LCS 280-656144/2-A	Lab Control Sample	Total/NA	Water	6010D	656144
280-192407-11 MS	MW-20B	Total/NA	Water	6010D	656144
280-192407-11 MSD	MW-20B	Total/NA	Water	6010D	656144

Analysis Batch: 656522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-22	MW-46B	Total/NA	Water	6020B	656150
MB 280-656150/1-A	Method Blank	Total/NA	Water	6020B	656150
LCS 280-656150/23-A	Lab Control Sample	Total/NA	Water	6020B	656150

Analysis Batch: 656568

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	6010D	656150
280-192407-22	MW-46B	Total/NA	Water	6010D	656150
MB 280-656150/1-A	Method Blank	Total/NA	Water	6010D	656150
LCS 280-656150/2-A	Lab Control Sample	Total/NA	Water	6010D	656150

Analysis Batch: 656569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	6010D	656144
280-192407-2	MW-45B	Total/NA	Water	6010D	656144
280-192407-3	MW-44B	Total/NA	Water	6010D	656144
280-192407-4	MW-43B	Total/NA	Water	6010D	656144
280-192407-5	MW-42B	Total/NA	Water	6010D	656144
280-192407-6	MW-41B	Total/NA	Water	6010D	656144
280-192407-7	MW-37B	Total/NA	Water	6010D	656144
280-192407-8	MW-39B	Total/NA	Water	6010D	656144
280-192407-9	MW-32B	Total/NA	Water	6010D	656144
280-192407-10	MW-14B	Total/NA	Water	6010D	656144
280-192407-11	MW-20B	Total/NA	Water	6010D	656144
280-192407-12	MW-36B	Total/NA	Water	6010D	656144
280-192407-13	MW-40B	Total/NA	Water	6010D	656144
280-192407-14	MW-53B2	Total/NA	Water	6010D	656144
280-192407-15	MW-52B	Total/NA	Water	6010D	656144
280-192407-16	MW-49B	Total/NA	Water	6010D	656144
280-192407-17	MW-38B	Total/NA	Water	6010D	656144
280-192407-18	MW-21B	Total/NA	Water	6010D	656144
280-192407-19	Dup-01	Total/NA	Water	6010D	656144
280-192407-20	MW-38C	Total/NA	Water	6010D	656144
MB 280-656144/1-A	Method Blank	Total/NA	Water	6010D	656144
LCS 280-656144/2-A	Lab Control Sample	Total/NA	Water	6010D	656144
280-192407-11 MS	MW-20B	Total/NA	Water	6010D	656144

Metals (Continued)

Analysis Batch: 656569 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-11 MSD	MW-20B	Total/NA	Water	6010D	656144

Analysis Batch: 656703

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	6020B	656144
280-192407-2	MW-45B	Total/NA	Water	6020B	656144
280-192407-3	MW-44B	Total/NA	Water	6020B	656144
280-192407-4	MW-43B	Total/NA	Water	6020B	656144
280-192407-5	MW-42B	Total/NA	Water	6020B	656144
280-192407-6	MW-41B	Total/NA	Water	6020B	656144
280-192407-7	MW-37B	Total/NA	Water	6020B	656144
280-192407-8	MW-39B	Total/NA	Water	6020B	656144
280-192407-9	MW-32B	Total/NA	Water	6020B	656144
280-192407-10	MW-14B	Total/NA	Water	6020B	656144
280-192407-11	MW-20B	Total/NA	Water	6020B	656144
280-192407-12	MW-36B	Total/NA	Water	6020B	656144
280-192407-13	MW-40B	Total/NA	Water	6020B	656144
280-192407-14	MW-53B2	Total/NA	Water	6020B	656144
280-192407-15	MW-52B	Total/NA	Water	6020B	656144
280-192407-16	MW-49B	Total/NA	Water	6020B	656144
280-192407-17	MW-38B	Total/NA	Water	6020B	656144
280-192407-18	MW-21B	Total/NA	Water	6020B	656144
280-192407-19	Dup-01	Total/NA	Water	6020B	656144
280-192407-20	MW-38C	Total/NA	Water	6020B	656144
MB 280-656144/1-A	Method Blank	Total/NA	Water	6020B	656144
LCS 280-656144/25-A	Lab Control Sample	Total/NA	Water	6020B	656144
280-192407-11 MS	MW-20B	Total/NA	Water	6020B	656144
280-192407-11 MSD	MW-20B	Total/NA	Water	6020B	656144

Prep Batch: 656992

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	7470A	
280-192407-2	MW-45B	Total/NA	Water	7470A	
280-192407-3	MW-44B	Total/NA	Water	7470A	
280-192407-4	MW-43B	Total/NA	Water	7470A	
280-192407-5	MW-42B	Total/NA	Water	7470A	
280-192407-6	MW-41B	Total/NA	Water	7470A	
280-192407-7	MW-37B	Total/NA	Water	7470A	
280-192407-8	MW-39B	Total/NA	Water	7470A	
280-192407-9	MW-32B	Total/NA	Water	7470A	
280-192407-10	MW-14B	Total/NA	Water	7470A	
280-192407-11	MW-20B	Total/NA	Water	7470A	
280-192407-12	MW-36B	Total/NA	Water	7470A	
280-192407-13	MW-40B	Total/NA	Water	7470A	
280-192407-14	MW-53B2	Total/NA	Water	7470A	
280-192407-15	MW-52B	Total/NA	Water	7470A	
280-192407-16	MW-49B	Total/NA	Water	7470A	
280-192407-17	MW-38B	Total/NA	Water	7470A	
280-192407-18	MW-21B	Total/NA	Water	7470A	
280-192407-19	Dup-01	Total/NA	Water	7470A	
280-192407-20	MW-38C	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 656992 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 280-656992/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-656992/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-192407-11 MS	MW-20B	Total/NA	Water	7470A	
280-192407-11 MSD	MW-20B	Total/NA	Water	7470A	

Prep Batch: 656994

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	7470A	
280-192407-22	MW-46B	Total/NA	Water	7470A	
MB 280-656994/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-656994/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 657037

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	6010D	656150
280-192407-22	MW-46B	Total/NA	Water	6010D	656150
MB 280-656150/1-A	Method Blank	Total/NA	Water	6010D	656150
LCS 280-656150/2-A	Lab Control Sample	Total/NA	Water	6010D	656150

Analysis Batch: 657111

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-14	MW-53B2	Total/NA	Water	6020B	656144
280-192407-15	MW-52B	Total/NA	Water	6020B	656144

Analysis Batch: 657128

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	7470A	656992
280-192407-2	MW-45B	Total/NA	Water	7470A	656992
280-192407-3	MW-44B	Total/NA	Water	7470A	656992
280-192407-4	MW-43B	Total/NA	Water	7470A	656992
280-192407-5	MW-42B	Total/NA	Water	7470A	656992
280-192407-6	MW-41B	Total/NA	Water	7470A	656992
280-192407-7	MW-37B	Total/NA	Water	7470A	656992
280-192407-8	MW-39B	Total/NA	Water	7470A	656992
280-192407-9	MW-32B	Total/NA	Water	7470A	656992
280-192407-10	MW-14B	Total/NA	Water	7470A	656992
280-192407-11	MW-20B	Total/NA	Water	7470A	656992
280-192407-12	MW-36B	Total/NA	Water	7470A	656992
280-192407-13	MW-40B	Total/NA	Water	7470A	656992
280-192407-14	MW-53B2	Total/NA	Water	7470A	656992
280-192407-15	MW-52B	Total/NA	Water	7470A	656992
280-192407-16	MW-49B	Total/NA	Water	7470A	656992
280-192407-17	MW-38B	Total/NA	Water	7470A	656992
280-192407-18	MW-21B	Total/NA	Water	7470A	656992
280-192407-19	Dup-01	Total/NA	Water	7470A	656992
280-192407-20	MW-38C	Total/NA	Water	7470A	656992
280-192407-21	Field Blank	Total/NA	Water	7470A	656994
280-192407-22	MW-46B	Total/NA	Water	7470A	656994
MB 280-656992/1-A	Method Blank	Total/NA	Water	7470A	656992
MB 280-656994/1-A	Method Blank	Total/NA	Water	7470A	656994
LCS 280-656992/2-A	Lab Control Sample	Total/NA	Water	7470A	656992

Metals (Continued)

Analysis Batch: 657128 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-656994/2-A	Lab Control Sample	Total/NA	Water	7470A	656994
280-192407-11 MS	MW-20B	Total/NA	Water	7470A	656992
280-192407-11 MSD	MW-20B	Total/NA	Water	7470A	656992

Prep Batch: 657489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	3020A	
MB 280-657489/1-A	Method Blank	Total/NA	Water	3010A	
LCS 280-657489/16-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 657669

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	6020B	657489
MB 280-657489/1-A	Method Blank	Total/NA	Water	6020B	657489
LCS 280-657489/16-A	Lab Control Sample	Total/NA	Water	6020B	657489

General Chemistry

Analysis Batch: 656218

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	9056A	
280-192407-1	MW-47B	Total/NA	Water	9056A	
280-192407-2	MW-45B	Total/NA	Water	9056A	
280-192407-2	MW-45B	Total/NA	Water	9056A	
280-192407-3	MW-44B	Total/NA	Water	9056A	
280-192407-3	MW-44B	Total/NA	Water	9056A	
280-192407-4	MW-43B	Total/NA	Water	9056A	
280-192407-4	MW-43B	Total/NA	Water	9056A	
280-192407-5	MW-42B	Total/NA	Water	9056A	
280-192407-5	MW-42B	Total/NA	Water	9056A	
280-192407-6	MW-41B	Total/NA	Water	9056A	
280-192407-6	MW-41B	Total/NA	Water	9056A	
280-192407-7	MW-37B	Total/NA	Water	9056A	
280-192407-7	MW-37B	Total/NA	Water	9056A	
280-192407-8	MW-39B	Total/NA	Water	9056A	
280-192407-8	MW-39B	Total/NA	Water	9056A	
280-192407-9	MW-32B	Total/NA	Water	9056A	
280-192407-9	MW-32B	Total/NA	Water	9056A	
280-192407-10	MW-14B	Total/NA	Water	9056A	
280-192407-10	MW-14B	Total/NA	Water	9056A	
280-192407-11	MW-20B	Total/NA	Water	9056A	
280-192407-11	MW-20B	Total/NA	Water	9056A	
280-192407-12	MW-36B	Total/NA	Water	9056A	
280-192407-12	MW-36B	Total/NA	Water	9056A	
280-192407-13	MW-40B	Total/NA	Water	9056A	
280-192407-13	MW-40B	Total/NA	Water	9056A	
280-192407-14	MW-53B2	Total/NA	Water	9056A	
280-192407-15	MW-52B	Total/NA	Water	9056A	
280-192407-15	MW-52B	Total/NA	Water	9056A	
280-192407-16	MW-49B	Total/NA	Water	9056A	
280-192407-16	MW-49B	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 656218 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-17	MW-38B	Total/NA	Water	9056A	
280-192407-17	MW-38B	Total/NA	Water	9056A	
280-192407-18	MW-21B	Total/NA	Water	9056A	
280-192407-18	MW-21B	Total/NA	Water	9056A	
280-192407-19	Dup-01	Total/NA	Water	9056A	
280-192407-19	Dup-01	Total/NA	Water	9056A	
280-192407-20	MW-38C	Total/NA	Water	9056A	
280-192407-21	Field Blank	Total/NA	Water	9056A	
280-192407-22	MW-46B	Total/NA	Water	9056A	
280-192407-22	MW-46B	Total/NA	Water	9056A	
MB 280-656218/6	Method Blank	Total/NA	Water	9056A	
MB 280-656218/61	Method Blank	Total/NA	Water	9056A	
LCS 280-656218/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-656218/59	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-656218/5	Lab Control Sample Dup	Total/NA	Water	9056A	
LCSD 280-656218/60	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-656218/3	Lab Control Sample	Total/NA	Water	9056A	
280-192407-11 MS	MW-20B	Total/NA	Water	9056A	
280-192407-11 MS	MW-20B	Total/NA	Water	9056A	
280-192407-11 MSD	MW-20B	Total/NA	Water	9056A	
280-192407-11 MSD	MW-20B	Total/NA	Water	9056A	
280-192407-11 DU	MW-20B	Total/NA	Water	9056A	
280-192407-11 DU	MW-20B	Total/NA	Water	9056A	

Analysis Batch: 656228

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	SM 2540C	
280-192407-2	MW-45B	Total/NA	Water	SM 2540C	
280-192407-3	MW-44B	Total/NA	Water	SM 2540C	
280-192407-4	MW-43B	Total/NA	Water	SM 2540C	
280-192407-5	MW-42B	Total/NA	Water	SM 2540C	
280-192407-6	MW-41B	Total/NA	Water	SM 2540C	
280-192407-7	MW-37B	Total/NA	Water	SM 2540C	
280-192407-8	MW-39B	Total/NA	Water	SM 2540C	
280-192407-9	MW-32B	Total/NA	Water	SM 2540C	
MB 280-656228/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-656228/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 656409

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-10	MW-14B	Total/NA	Water	SM 2540C	
280-192407-11	MW-20B	Total/NA	Water	SM 2540C	
280-192407-12	MW-36B	Total/NA	Water	SM 2540C	
280-192407-13	MW-40B	Total/NA	Water	SM 2540C	
280-192407-14	MW-53B2	Total/NA	Water	SM 2540C	
280-192407-15	MW-52B	Total/NA	Water	SM 2540C	
280-192407-16	MW-49B	Total/NA	Water	SM 2540C	
280-192407-17	MW-38B	Total/NA	Water	SM 2540C	
MB 280-656409/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-656409/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-192407-17 DU	MW-38B	Total/NA	Water	SM 2540C	

General Chemistry

Analysis Batch: 656410

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-18	MW-21B	Total/NA	Water	SM 2540C	
280-192407-19	Dup-01	Total/NA	Water	SM 2540C	
280-192407-20	MW-38C	Total/NA	Water	SM 2540C	
280-192407-21	Field Blank	Total/NA	Water	SM 2540C	
280-192407-22	MW-46B	Total/NA	Water	SM 2540C	
MB 280-656410/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-656410/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-192407-18 DU	MW-21B	Total/NA	Water	SM 2540C	

Analysis Batch: 656899

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-17	MW-38B	Total/NA	Water	9056A	
280-192407-19	Dup-01	Total/NA	Water	9056A	
280-192407-20	MW-38C	Total/NA	Water	9056A	
MB 280-656899/46	Method Blank	Total/NA	Water	9056A	
MB 280-656899/6	Method Blank	Total/NA	Water	9056A	
LCS 280-656899/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-656899/44	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-656899/45	Lab Control Sample Dup	Total/NA	Water	9056A	
LCSD 280-656899/5	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-656899/3	Lab Control Sample	Total/NA	Water	9056A	
280-192407-17 MS	MW-38B	Total/NA	Water	9056A	
280-192407-17 MSD	MW-38B	Total/NA	Water	9056A	
280-192407-17 DU	MW-38B	Total/NA	Water	9056A	

Client Sample ID: MW-47B

Lab Sample ID: 280-192407-1

Date Collected: 06/04/24 10:42

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 22:52	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:15	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:01	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:23	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 17:16	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 17:27	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-45B

Lab Sample ID: 280-192407-2

Date Collected: 06/04/24 11:12

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 22:55	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:19	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:04	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:26	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 17:39	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 17:50	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-44B

Lab Sample ID: 280-192407-3

Date Collected: 06/04/24 11:42

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 22:59	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:23	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:08	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:28	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 04:38	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/08/24 04:49	EJS	EET DEN

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:03	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:27	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:11	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:31	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 18:01	EJS	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	656218	06/07/24 18:12	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:07	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:31	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:15	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:33	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 18:23	EJS	EET DEN
Total/NA	Analysis	9056A		20	10 mL	10 mL	656218	06/07/24 18:34	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:11	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:35	NKC	EET DEN

Client Sample ID: MW-41B

Lab Sample ID: 280-192407-6

Date Collected: 06/04/24 14:29

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:18	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:36	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 19:06	EJS	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	656218	06/07/24 19:17	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-37B

Lab Sample ID: 280-192407-7

Date Collected: 06/04/24 15:12

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:15	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:39	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:22	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:38	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 03:54	EJS	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	656218	06/08/24 04:05	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-39B

Lab Sample ID: 280-192407-8

Date Collected: 06/04/24 17:10

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:19	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:54	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:25	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:41	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 19:28	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 19:39	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-32B

Lab Sample ID: 280-192407-9

Date Collected: 06/04/24 16:18

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:34	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 17:58	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:36	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:49	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 19:50	EJS	EET DEN
Total/NA	Analysis	9056A		20	10 mL	10 mL	656218	06/07/24 20:01	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656228	06/07/24 10:26	MF	EET DEN

Client Sample ID: MW-14B

Lab Sample ID: 280-192407-10

Date Collected: 06/05/24 09:21

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:38	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:02	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:40	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:51	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 20:12	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 20:23	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-20B

Lab Sample ID: 280-192407-11

Date Collected: 06/05/24 10:49

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/07/24 23:41	ADL	EET DEN
Total/NA	Prep	3010A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:06	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 00:43	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 00:54	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 20:34	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 21:18	EJS	EET DEN

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:01	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:25	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:01	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:01	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 22:24	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 22:35	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:05	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:29	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:04	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:04	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 22:46	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 22:57	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:09	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:43	NKC	EET DEN

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Client Sample ID: MW-53B2

Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:15	LMT	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			657111	06/14/24 10:42	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:06	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 04:59	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-52B

Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:24	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:47	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:19	LMT	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			657111	06/14/24 10:46	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:09	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 05:21	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/08/24 05:32	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-49B

Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:27	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:51	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:22	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:11	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 06:05	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/08/24 06:16	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-38B

Lab Sample ID: 280-192407-17

Date Collected: 06/05/24 18:22

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:31	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:55	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:26	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:19	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 23:52	EJS	EET DEN
Total/NA	Analysis	9056A		20	10 mL	10 mL	656218	06/08/24 00:03	EJS	EET DEN
Total/NA	Analysis	9056A		50	10 mL	10 mL	656899	06/13/24 23:53	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	656409	06/10/24 09:53	MF	EET DEN

Client Sample ID: MW-21B

Lab Sample ID: 280-192407-18

Date Collected: 06/05/24 19:01

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:35	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 18:59	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:29	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:22	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 00:36	EJS	EET DEN
Total/NA	Analysis	9056A		20	10 mL	10 mL	656218	06/08/24 00:47	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	25 mL	100 mL	656410	06/10/24 09:55	MF	EET DEN

Client Sample ID: Dup-01

Lab Sample ID: 280-192407-19

Date Collected: 06/05/24 00:00

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:39	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 19:03	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:33	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:24	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 00:58	EJS	EET DEN

Client Sample ID: Dup-01

Lab Sample ID: 280-192407-19

Date Collected: 06/05/24 00:00

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9056A		20	10 mL	10 mL	656218	06/08/24 01:09	EJS	EET DEN
Total/NA	Analysis	9056A		50	10 mL	10 mL	656899	06/13/24 23:09	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	656410	06/10/24 09:55	MF	EET DEN

Client Sample ID: MW-38C

Lab Sample ID: 280-192407-20

Date Collected: 06/05/24 19:27

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656427	06/08/24 00:43	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6010D		1			656569	06/10/24 19:07	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656144	06/07/24 08:24	SLH	EET DEN
Total/NA	Analysis	6020B		1			656703	06/12/24 01:36	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656992	06/13/24 17:16	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 01:27	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 23:08	EJS	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	656899	06/14/24 01:53	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	656410	06/10/24 09:55	MF	EET DEN

Client Sample ID: Field Blank

Lab Sample ID: 280-192407-21

Date Collected: 06/05/24 19:30

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656150	06/06/24 17:11	KO	EET DEN
Total/NA	Analysis	6010D		1			656568	06/10/24 21:09	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656150	06/06/24 17:11	KO	EET DEN
Total/NA	Analysis	6010D		1			657037	06/13/24 15:57	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	657489	06/18/24 20:44	CAF	EET DEN
Total/NA	Analysis	6020B		1			657669	06/19/24 22:03	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656994	06/13/24 19:26	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 02:43	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/08/24 01:20	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	656410	06/10/24 09:55	MF	EET DEN

Client Sample ID: MW-46B

Lab Sample ID: 280-192407-22

Date Collected: 06/05/24 20:14

Matrix: Water

Date Received: 06/06/24 12:10

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656150	06/06/24 17:11	KO	EET DEN
Total/NA	Analysis	6010D		1			656568	06/10/24 21:05	NKC	EET DEN

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-1

Client Sample ID: MW-46B

Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	656150	06/06/24 17:11	KO	EET DEN
Total/NA	Analysis	6010D		1			657037	06/13/24 15:52	NKC	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	656150	06/06/24 17:11	KO	EET DEN
Total/NA	Analysis	6020B		1			656522	06/10/24 21:28	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	656994	06/13/24 19:26	CAF	EET DEN
Total/NA	Analysis	7470A		1			657128	06/14/24 02:50	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	656218	06/07/24 23:30	EJS	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	656218	06/07/24 23:41	EJS	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	656410	06/10/24 09:55	MF	EET DEN

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM Technical Services Inc.
Job ID: 280-192407-1
Project/Site: Basin 2024 Support

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025-020	01-08-25

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

Chain of Custody Record

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Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-140846-38645.5
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:	Page:
Company: AECOM Technical Services Inc.	PWSID:	Analysis Requested		Job #:

Address: 6200 S. Quebec Street	Due Date Requested:	Preservation Codes: D - HNO3 N - None
City: Greenwood Village	TAT Requested (days):	
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No	
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145	
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474	
Project Name: Basin 2024 Support	Project #: 28020759	
Site:	SSOW#:	Other:

280-192407 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A Total Metals	2540C_Calcd - Solids, Total Dissolved (TDS)	Total Number of contai	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-47B	6/4/24	1042	G	W			X	X	X	X	X	5	
MW-45B		1112					X	X	X	X	X	5	
MW-44B		1142					X	X	X	X	X	5	
MW-43B		1239					X	X	X	X	X	5	
MW-42B		1324					X	X	X	X	X	5	
MW-41B		1429					X	X	X	X	X	5	
MW-37B		1512					X	X	X	X	X	5	
MW-39B		1710					X	X	X	X	X	5	
MW-32B		1618					X	X	X	X	X	5	
MW-14B	6/5/24	0921					X	X	X	X	X	5	
MW-30B		1049				Y	X	X	X	X	X	5	MS/MSD

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6/6/24 1210	AECOM		6/6/24 1210	EDF
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.2, 3.4, 4.3, 4.4, 4.4 IR Naga CF 0.2

Ver: 04/02/2024

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

Chain of Custody Record

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Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-140846-38645.4
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:	Page:
Company: AECOM Technical Services Inc.	PWSID:			Job #:
Address: 6200 S. Quebec Street	Due Date Requested:			
City: Greenwood Village	TAT Requested (days):			
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No			
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145			
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:
D - HNO3
N - None

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A Total Metals	2540C_Calcd - Solids, Total Dissolved (TDS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-36B	6/5/24	1136	G	W			X	X	X	X	X	5	
MW-40B		1222					X	X	X	X	X	5	
MW-53BR		1339					X	X	X	X	X	5	
MW-52B		1549					X	X	X	X	X	5	
MW-49B		1717					X	X	X	X	X	5	
MW-38B		1822					X	X	X	X	X	5	
MW-31B		1906 ~~1901~~					X	X	X	X	X	5	
Dup-01		—					X	X	X	X	X	5	
MW-38C		1927					X	X	X	X	X	5	
Field Blank		1930					X	X	X	X	X	5	
MW-46B		2014					X	X	X	X	X	5	

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
[signature]	6/6/24 1210	AECOM	[signature]	06/06/24 1210	EETDEN

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.2, 3.4, 4.3, 4.4, 4.4 IR Naga CF 0.2

Ver: 04/02/2024

6/20/2024

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 280-192407-1

Login Number: 192407
List Number: 1
Creator: Held, Wesley

List Source: Eurofins Denver

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

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

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Katie Abbott
AECOM Technical Services Inc.
6200 S. Quebec Street
Greenwood Village, Colorado 80111

Generated 7/10/2024 4:14:53 PM

JOB DESCRIPTION

Basin 2024 Support

JOB NUMBER

280-192407-2

Eurofins Denver
4955 Yarrow Street
Arvada CO 80002

See page two for job notes and contact information.

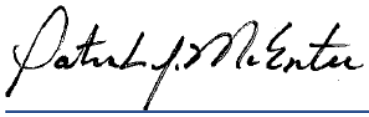
myEOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



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Authorized for release by
Patrick McEntee, Client Service Manager
Patrick.McEntee@et.eurofinsus.com
(303)736-0107

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Definitions/Glossary

Client: AECOM Technical Services Inc.
Job ID: 280-192407-2
Project/Site: Basin 2024 Support

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

Job Narrative
280-192407-2

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.

Eurofins Environment Testing attests to the validity of the laboratory data generated by Eurofins facilities reported herein. All analyses performed by Eurofins Environment Testing facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins Environment Testing's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report.

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

Proper preservation was noted for the methods performed on these samples, unless otherwise detailed below.

All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy or unless requested as wet weight by the client.

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 matrix for the Method Blank and LCS/LCSD is as close to the samples as can be reasonably achieved. Detailed information can be found in the most current revision of the associated SOP.

The method blank (MB) z-score is within limits, unless stated otherwise below, and is stored in the level IV raw data.

This laboratory report is confidential and is intended for the sole use of Eurofins Environment Testing and its client.

Receipt
The samples were received on 6/6/2024 12:10 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 2.4°C, 3.6°C, 4.5°C, 4.6°C and 4.6°C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

Receipt Exceptions
Radium 226 and Radium 228 results are reported in SDG 280-192407-2. All other requested analyses are reported in SDG 280-192407-1. 280-192407-1, 280-192407-2, 280-192407-3, 280-192407-4, 280-192407-5, 280-192407-6, 280-192407-7, 280-192407-8, 280-192407-9, 280-192407-10, 280-192407-11, 280-192407-11[MS], 280-192407-11[MSD], 280-192407-12, 280-192407-13, 280-192407-14, 280-192407-15, 280-192407-16, 280-192407-17, 280-192407-18, 280-192407-19, 280-192407-20, 280-192407-21 and 280-192407-22

Method 9315 - Radium-226 (GFPC)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Radium-226 (GFPC). The samples were prepared on

Job ID: 280-192407-2 (Continued) Eurofins Denver

6/13/2024 and analyzed on 7/8/2024 and 7/9/2024.

Radium-226 prep batch 160-666170. The following sample(s) were prepared at a reduced aliquot due to matrix. MW-53B2 (280-192407-14), MW-52B (280-192407-15). The sample(s): were cloudy

Method 9320 - Radium-228 (GFPC)
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-20B (280-192407-11MS), MW-20B (280-192407-11MSD), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Radium-228 (GFPC). The samples were prepared on 6/13/2024 and analyzed on 7/3/2024.

Radium-228 prep batch 160-666171. The following sample(s) were prepared at a reduced aliquot due to matrix. MW-53B2 (280-192407-14), MW-52B (280-192407-15). The sample(s): were cloudy

Method Ra226_Ra228 - Combined Radium-226 and Radium-228
Samples MW-47B (280-192407-1), MW-45B (280-192407-2), MW-44B (280-192407-3), MW-43B (280-192407-4), MW-42B (280-192407-5), MW-41B (280-192407-6), MW-37B (280-192407-7), MW-39B (280-192407-8), MW-32B (280-192407-9), MW-14B (280-192407-10), MW-20B (280-192407-11), MW-36B (280-192407-12), MW-40B (280-192407-13), MW-53B2 (280-192407-14), MW-52B (280-192407-15), MW-49B (280-192407-16), MW-38B (280-192407-17), MW-21B (280-192407-18), Dup-01 (280-192407-19), MW-38C (280-192407-20), Field Blank (280-192407-21) and MW-46B (280-192407-22) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 7/9/2024 and 7/10/2024.

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-47B — Lab Sample ID: 280-192407-1

No Detections.

Client Sample ID: MW-45B — Lab Sample ID: 280-192407-2

No Detections.

Client Sample ID: MW-44B — Lab Sample ID: 280-192407-3

No Detections.

Client Sample ID: MW-43B — Lab Sample ID: 280-192407-4

No Detections.

Client Sample ID: MW-42B — Lab Sample ID: 280-192407-5

No Detections.

Client Sample ID: MW-41B — Lab Sample ID: 280-192407-6

No Detections.

Client Sample ID: MW-37B — Lab Sample ID: 280-192407-7

No Detections.

Client Sample ID: MW-39B — Lab Sample ID: 280-192407-8

No Detections.

Client Sample ID: MW-32B — Lab Sample ID: 280-192407-9

No Detections.

Client Sample ID: MW-14B — Lab Sample ID: 280-192407-10

No Detections.

Client Sample ID: MW-20B — Lab Sample ID: 280-192407-11

No Detections.

Client Sample ID: MW-36B — Lab Sample ID: 280-192407-12

No Detections.

Client Sample ID: MW-40B — Lab Sample ID: 280-192407-13

No Detections.

Client Sample ID: MW-53B2 — Lab Sample ID: 280-192407-14

No Detections.

Client Sample ID: MW-52B — Lab Sample ID: 280-192407-15

No Detections.

Client Sample ID: MW-49B — Lab Sample ID: 280-192407-16

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins Denver

Detection Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-38B — Lab Sample ID: 280-192407-17

No Detections.

Client Sample ID: MW-21B — Lab Sample ID: 280-192407-18

No Detections.

Client Sample ID: Dup-01 — Lab Sample ID: 280-192407-19

No Detections.

Client Sample ID: MW-38C — Lab Sample ID: 280-192407-20

No Detections.

Client Sample ID: Field Blank — Lab Sample ID: 280-192407-21

No Detections.

Client Sample ID: MW-46B — Lab Sample ID: 280-192407-22

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

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

Sample Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-192407-1	MW-47B	Water	06/04/24 10:42	06/06/24 12:10
280-192407-2	MW-45B	Water	06/04/24 11:12	06/06/24 12:10
280-192407-3	MW-44B	Water	06/04/24 11:42	06/06/24 12:10
280-192407-4	MW-43B	Water	06/04/24 12:39	06/06/24 12:10
280-192407-5	MW-42B	Water	06/04/24 13:24	06/06/24 12:10
280-192407-6	MW-41B	Water	06/04/24 14:29	06/06/24 12:10
280-192407-7	MW-37B	Water	06/04/24 15:12	06/06/24 12:10
280-192407-8	MW-39B	Water	06/04/24 17:10	06/06/24 12:10
280-192407-9	MW-32B	Water	06/04/24 16:18	06/06/24 12:10
280-192407-10	MW-14B	Water	06/05/24 09:21	06/06/24 12:10
280-192407-11	MW-20B	Water	06/05/24 10:49	06/06/24 12:10
280-192407-12	MW-36B	Water	06/05/24 11:36	06/06/24 12:10
280-192407-13	MW-40B	Water	06/05/24 12:22	06/06/24 12:10
280-192407-14	MW-53B2	Water	06/05/24 13:39	06/06/24 12:10
280-192407-15	MW-52B	Water	06/05/24 15:49	06/06/24 12:10
280-192407-16	MW-49B	Water	06/05/24 17:07	06/06/24 12:10
280-192407-17	MW-38B	Water	06/05/24 18:22	06/06/24 12:10
280-192407-18	MW-21B	Water	06/05/24 19:01	06/06/24 12:10
280-192407-19	Dup-01	Water	06/05/24 00:00	06/06/24 12:10
280-192407-20	MW-38C	Water	06/05/24 19:27	06/06/24 12:10
280-192407-21	Field Blank	Water	06/05/24 19:30	06/06/24 12:10
280-192407-22	MW-46B	Water	06/05/24 20:14	06/06/24 12:10

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0727	U	0.0691	0.0694	1.00	0.105	pCi/L	06/13/24 08:19	07/09/24 07:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:40*	*1*

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0887	U	0.0738	0.0743	1.00	0.107	pCi/L	06/13/24 08:19	07/09/24 07:40	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.8*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:40*	*1*

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0450	U	0.0630	0.0631	1.00	0.107	pCi/L	06/13/24 08:19	07/09/24 07:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:41*	*1*

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0610	U	0.0591	0.0594	1.00	0.0885	pCi/L	06/13/24 08:19	07/09/24 07:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:41*	*1*

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.102	U	0.0830	0.0835	1.00	0.121	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0302	U	0.0739	0.0739	1.00	0.135	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.138	U	0.0996	0.100	1.00	0.143	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.1*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0716	U	0.0805	0.0807	1.00	0.130	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.0*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.149**		0.0947	0.0956	1.00	0.130	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0384	U	0.0621	0.0622	1.00	0.109	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0890	U	0.0754	0.0758	1.00	0.111	pCi/L	06/13/24 08:19	07/09/24 07:59	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.5*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:59*	*1*

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0445	U	0.0698	0.0699	1.00	0.160	pCi/L	06/13/24 08:19	07/09/24 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:58*	*1*

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.120**		0.0854	0.0861	1.00	0.120	pCi/L	06/13/24 08:19	07/09/24 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.8*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:58*	*1*

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.952**		0.270	0.284	1.00	0.228	pCi/L	06/13/24 08:19	07/09/24 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.5*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:58*	*1*

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.190**		0.123	0.124	1.00	0.167	pCi/L	06/13/24 08:19	07/09/24 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.8*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:58*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.0237	U	0.0716	0.0716	1.00	0.152	pCi/L	06/13/24 08:19	07/09/24 07:58	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.0*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:58*	*1*

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0576	U	0.0835	0.0836	1.00	0.142	pCi/L	06/13/24 08:19	07/09/24 07:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.6*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:50*	*1*

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.102	U	0.0948	0.0953	1.00	0.147	pCi/L	06/13/24 08:19	07/09/24 07:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.9*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:50*	*1*

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0818	U	0.0796	0.0800	1.00	0.124	pCi/L	06/13/24 08:19	07/09/24 07:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:50*	*1*

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.00890	U	0.0540	0.0540	1.00	0.117	pCi/L	06/13/24 08:19	07/09/24 07:50	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.3*		*30 - 110*	*06/13/24 08:19*	*07/09/24 07:50*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0336	U	0.0560	0.0561	1.00	0.0988	pCi/L	06/13/24 08:24	07/08/24 21:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.5*		*30 - 110*	*06/13/24 08:24*	*07/08/24 21:06*	*1*

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0889	U	0.0755	0.0759	1.00	0.111	pCi/L	06/13/24 08:24	07/08/24 21:06	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.8*		*30 - 110*	*06/13/24 08:24*	*07/08/24 21:06*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.351	U	0.291	0.293	1.00	0.448	pCi/L	06/13/24 08:22	07/03/24 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.8*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:10*	*1*
Y Carrier	*86.0*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:10*	*1*

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.497	U	0.343	0.346	1.00	0.514	pCi/L	06/13/24 08:22	07/03/24 12:10	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.8*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:10*	*1*
Y Carrier	*83.4*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:10*	*1*

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.543**		0.334	0.338	1.00	0.483	pCi/L	06/13/24 08:22	07/03/24 12:10	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		30 - 110	06/13/24 08:22	07/03/24 12:10	1
Y Carrier	82.6		30 - 110	06/13/24 08:22	07/03/24 12:10	1

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.378	U	0.299	0.301	1.00	0.456	pCi/L	06/13/24 08:22	07/03/24 12:10	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	98.3		30 - 110	06/13/24 08:22	07/03/24 12:10	1
Y Carrier	83.4		30 - 110	06/13/24 08:22	07/03/24 12:10	1

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.218	U	0.322	0.323	1.00	0.546	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		30 - 110	06/13/24 08:22	07/03/24 12:11	1
Y Carrier	81.5		30 - 110	06/13/24 08:22	07/03/24 12:11	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.144	U	0.303	0.303	1.00	0.530	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.3		30 - 110	06/13/24 08:22	07/03/24 12:11	1
Y Carrier	84.5		30 - 110	06/13/24 08:22	07/03/24 12:11	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.269	U	0.315	0.316	1.00	0.518	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.1		30 - 110	06/13/24 08:22	07/03/24 12:11	1
Y Carrier	84.5		30 - 110	06/13/24 08:22	07/03/24 12:11	1

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.304	U	0.318	0.319	1.00	0.516	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.0*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*
Y Carrier	*83.0*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.109	U	0.251	0.251	1.00	0.445	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.3*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*
Y Carrier	*82.6*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.225	U	0.270	0.271	1.00	0.445	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.3*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*
Y Carrier	*83.7*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.294	U	0.295	0.296	1.00	0.473	pCi/L	06/13/24 08:22	07/03/24 12:11	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*99.5*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*
Y Carrier	*83.7*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:11*	*1*

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.525**		0.347	0.350	1.00	0.512	pCi/L	06/13/24 08:22	07/03/24 12:17	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.3		30 - 110	06/13/24 08:22	07/03/24 12:17	1
Y Carrier	83.0		30 - 110	06/13/24 08:22	07/03/24 12:17	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.486	U	0.399	0.401	1.00	0.624	pCi/L	06/13/24 08:22	07/03/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	91.8		30 - 110	06/13/24 08:22	07/03/24 12:17	1
Y Carrier	84.1		30 - 110	06/13/24 08:22	07/03/24 12:17	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.62**		0.725	0.740	1.00	0.950	pCi/L	06/13/24 08:22	07/03/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		30 - 110	06/13/24 08:22	07/03/24 12:17	1
Y Carrier	83.7		30 - 110	06/13/24 08:22	07/03/24 12:17	1

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.07**		0.485	0.494	1.00	0.632	pCi/L	06/13/24 08:22	07/03/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	94.8		30 - 110	06/13/24 08:22	07/03/24 12:17	1
Y Carrier	84.9		30 - 110	06/13/24 08:22	07/03/24 12:17	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.325	U	0.324	0.326	1.00	0.521	pCi/L	06/13/24 08:22	07/03/24 12:15	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.0		30 - 110	06/13/24 08:22	07/03/24 12:15	1
Y Carrier	82.2		30 - 110	06/13/24 08:22	07/03/24 12:15	1

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.256	U	0.366	0.367	1.00	0.616	pCi/L	06/13/24 08:22	07/03/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.6*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:15*	*1*
Y Carrier	*79.6*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:15*	*1*

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.338	U	0.422	0.423	1.00	0.700	pCi/L	06/13/24 08:22	07/03/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*81.9*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:15*	*1*
Y Carrier	*84.9*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:15*	*1*

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.507	U	0.355	0.358	1.00	0.535	pCi/L	06/13/24 08:22	07/03/24 12:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.3*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:16*	*1*
Y Carrier	*85.6*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:16*	*1*

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.256	U	0.317	0.318	1.00	0.526	pCi/L	06/13/24 08:22	07/03/24 12:16	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.3*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:16*	*1*
Y Carrier	*84.1*		*30 - 110*	*06/13/24 08:22*	*07/03/24 12:16*	*1*

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.338	U	0.383	0.385	1.00	0.629	pCi/L	06/13/24 08:26	07/03/24 12:29	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.5		30 - 110	06/13/24 08:26	07/03/24 12:29	1
Y Carrier	84.9		30 - 110	06/13/24 08:26	07/03/24 12:29	1

Client Sample ID: MW-46B — **Lab Sample ID: 280-192407-22**
Date Collected: 06/05/24 20:14 — **Matrix: Water**
Date Received: 06/06/24 12:10

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.242	U	0.388	0.388	1.00	0.657	pCi/L	06/13/24 08:26	07/03/24 12:29	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.8		30 - 110	06/13/24 08:26	07/03/24 12:29	1
Y Carrier	85.6		30 - 110	06/13/24 08:26	07/03/24 12:29	1

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

Client Sample ID: MW-47B — **Lab Sample ID: 280-192407-1**
Date Collected: 06/04/24 10:42 — **Matrix: Water**
Date Received: 06/06/24 12:10

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.423	U	0.299	0.301	5.00	0.448	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-45B — **Lab Sample ID: 280-192407-2**
Date Collected: 06/04/24 11:12 — **Matrix: Water**
Date Received: 06/06/24 12:10

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.585**		0.351	0.354	5.00	0.514	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-44B — **Lab Sample ID: 280-192407-3**
Date Collected: 06/04/24 11:42 — **Matrix: Water**
Date Received: 06/06/24 12:10

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.588**		0.340	0.344	5.00	0.483	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-43B — **Lab Sample ID: 280-192407-4**
Date Collected: 06/04/24 12:39 — **Matrix: Water**
Date Received: 06/06/24 12:10

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.439	U	0.305	0.307	5.00	0.456	pCi/L		07/09/24 13:46	1

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

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.320	U	0.333	0.334	5.00	0.546	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.174	U	0.312	0.312	5.00	0.530	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.407	U	0.330	0.331	5.00	0.518	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.375	U	0.328	0.329	5.00	0.516	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.258	U	0.268	0.269	5.00	0.445	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.264	U	0.277	0.278	5.00	0.445	pCi/L		07/09/24 13:46	1

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

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.383	U	0.304	0.306	5.00	0.473	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.481	U	0.354	0.357	5.00	0.512	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.606	U	0.408	0.410	5.00	0.624	pCi/L		07/09/24 13:46	1

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**2.57**		0.774	0.793	5.00	0.950	pCi/L		07/10/24 14:26	1

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.26**		0.500	0.509	5.00	0.632	pCi/L		07/10/24 14:26	1

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.301	U	0.332	0.334	5.00	0.521	pCi/L		07/10/24 14:26	1

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

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.314	U	0.375	0.376	5.00	0.616	pCi/L		07/10/24 14:26	1

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.440	U	0.433	0.434	5.00	0.700	pCi/L		07/10/24 14:26	1

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.589**		0.364	0.367	5.00	0.535	pCi/L		07/10/24 14:26	1

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.247	U	0.322	0.323	5.00	0.526	pCi/L		07/10/24 14:26	1

Client Sample ID: Field Blank
Date Collected: 06/05/24 19:30
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.372	U	0.387	0.389	5.00	0.629	pCi/L		07/10/24 14:26	1

Client Sample ID: MW-46B
Date Collected: 06/05/24 20:14
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-22
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.331	U	0.395	0.395	5.00	0.657	pCi/L		07/10/24 14:26	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-666170/1-A
Matrix: Water
Analysis Batch: 669704

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 666170

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.03832	U	0.0552	0.0553	1.00	0.132	pCi/L	06/13/24 08:19	07/08/24 23:53	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.0*		*30 - 110*	*06/13/24 08:19*	*07/08/24 23:53*	*1*

Lab Sample ID: LCS 160-666170/2-A
Matrix: Water
Analysis Batch: 669704

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666170

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.26		1.10	1.00	0.129	pCi/L	91	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*95.8*		*30 - 110*

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 669786

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 666170

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226	0.0890	U	11.3	9.626		1.03	1.00	0.106	pCi/L	84	60 - 140		

Carrier	*MS %Yield*	*MS Qualifier*	*Limits*
Ba Carrier	*99.5*		*30 - 110*

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 669786

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 666170

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	0.0890	U	11.4	9.786		1.05	1.00	0.111	pCi/L	85	60 - 140	0.08	1

Carrier	*MSD %Yield*	*MSD Qualifier*	*Limits*
Ba Carrier	*98.0*		*30 - 110*

Lab Sample ID: MB 160-666173/1-A
Matrix: Water
Analysis Batch: 669598

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 666173

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.07284	U	0.0693	0.0696	1.00	0.105	pCi/L	06/13/24 08:24	07/08/24 21:06	1

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

Lab Sample ID: MB 160-666173/1-A
Matrix: Water
Analysis Batch: 669598

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 666173

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.8		30 - 110	06/13/24 08:24	07/08/24 21:06	1

Lab Sample ID: LCS 160-666173/2-A
Matrix: Water
Analysis Batch: 669598

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666173

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	9.878		1.06	1.00	0.150	pCi/L	87	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	100		30 - 110

Lab Sample ID: 280-192407-22 DU
Matrix: Water
Analysis Batch: 669702

Client Sample ID: MW-46B
Prep Type: Total/NA
Prep Batch: 666173

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.0889	U		0.05802	U	0.0726	1.00	0.120	pCi/L			0.21	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	97.3		30 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-666171/1-A
Matrix: Water
Analysis Batch: 669231

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 666171

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.3776	U	0.307	0.309	1.00	0.473	pCi/L	06/13/24 08:22	07/03/24 12:10	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.0		30 - 110	06/13/24 08:22	07/03/24 12:10	1
Y Carrier	83.4		30 - 110	06/13/24 08:22	07/03/24 12:10	1

Lab Sample ID: LCS 160-666171/2-A
Matrix: Water
Analysis Batch: 669231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666171

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.80	9.199		1.25	1.00	0.461	pCi/L	105	75 - 125		

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

Lab Sample ID: LCS 160-666171/2-A
Matrix: Water
Analysis Batch: 669231

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666171

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	95.8		30 - 110
Y Carrier	84.5		30 - 110

Lab Sample ID: 280-192407-11 MS
Matrix: Water
Analysis Batch: 669100

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 666171

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228	0.294	U	8.80	8.302		1.17	1.00	0.539	pCi/L	91	60 - 140		

Carrier	MS %Yield	MS Qualifier	Limits
Ba Carrier	99.5		30 - 110
Y Carrier	85.6		30 - 110

Lab Sample ID: 280-192407-11 MSD
Matrix: Water
Analysis Batch: 669100

Client Sample ID: MW-20B
Prep Type: Total/NA
Prep Batch: 666171

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228	0.294	U	8.83	9.318		1.28	1.00	0.534	pCi/L	102	60 - 140	0.42	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Ba Carrier	98.0		30 - 110
Y Carrier	83.4		30 - 110

Lab Sample ID: MB 160-666175/1-A
Matrix: Water
Analysis Batch: 669230

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 666175

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.1955	U	0.310	0.310	1.00	0.528	pCi/L	06/13/24 08:26	07/03/24 12:29	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.8		30 - 110	06/13/24 08:26	07/03/24 12:29	1
Y Carrier	86.7		30 - 110	06/13/24 08:26	07/03/24 12:29	1

Lab Sample ID: LCS 160-666175/2-A
Matrix: Water
Analysis Batch: 669230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666175

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.80	9.050		1.23	1.00	0.471	pCi/L	103	75 - 125		

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

Lab Sample ID: LCS 160-666175/2-A
Matrix: Water
Analysis Batch: 669230

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 666175

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	100		30 - 110
Y Carrier	88.6		30 - 110

Lab Sample ID: 280-192407-22 DU
Matrix: Water
Analysis Batch: 669232

Client Sample ID: MW-46B
Prep Type: Total/NA
Prep Batch: 666175

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.242	U		0.2153	U	0.332	1.00	0.561	pCi/L			0.04	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	97.3		30 - 110
Y Carrier	86.0		30 - 110

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Prep Batch: 666170

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	PrecSep-21	
280-192407-2	MW-45B	Total/NA	Water	PrecSep-21	
280-192407-3	MW-44B	Total/NA	Water	PrecSep-21	
280-192407-4	MW-43B	Total/NA	Water	PrecSep-21	
280-192407-5	MW-42B	Total/NA	Water	PrecSep-21	
280-192407-6	MW-41B	Total/NA	Water	PrecSep-21	
280-192407-7	MW-37B	Total/NA	Water	PrecSep-21	
280-192407-8	MW-39B	Total/NA	Water	PrecSep-21	
280-192407-9	MW-32B	Total/NA	Water	PrecSep-21	
280-192407-10	MW-14B	Total/NA	Water	PrecSep-21	
280-192407-11	MW-20B	Total/NA	Water	PrecSep-21	
280-192407-12	MW-36B	Total/NA	Water	PrecSep-21	
280-192407-13	MW-40B	Total/NA	Water	PrecSep-21	
280-192407-14	MW-53B2	Total/NA	Water	PrecSep-21	
280-192407-15	MW-52B	Total/NA	Water	PrecSep-21	
280-192407-16	MW-49B	Total/NA	Water	PrecSep-21	
280-192407-17	MW-38B	Total/NA	Water	PrecSep-21	
280-192407-18	MW-21B	Total/NA	Water	PrecSep-21	
280-192407-19	Dup-01	Total/NA	Water	PrecSep-21	
280-192407-20	MW-38C	Total/NA	Water	PrecSep-21	
MB 160-666170/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-666170/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
280-192407-11 MS	MW-20B	Total/NA	Water	PrecSep-21	
280-192407-11 MSD	MW-20B	Total/NA	Water	PrecSep-21	

Prep Batch: 666171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-1	MW-47B	Total/NA	Water	PrecSep_0	
280-192407-2	MW-45B	Total/NA	Water	PrecSep_0	
280-192407-3	MW-44B	Total/NA	Water	PrecSep_0	
280-192407-4	MW-43B	Total/NA	Water	PrecSep_0	
280-192407-5	MW-42B	Total/NA	Water	PrecSep_0	
280-192407-6	MW-41B	Total/NA	Water	PrecSep_0	
280-192407-7	MW-37B	Total/NA	Water	PrecSep_0	
280-192407-8	MW-39B	Total/NA	Water	PrecSep_0	
280-192407-9	MW-32B	Total/NA	Water	PrecSep_0	
280-192407-10	MW-14B	Total/NA	Water	PrecSep_0	
280-192407-11	MW-20B	Total/NA	Water	PrecSep_0	
280-192407-12	MW-36B	Total/NA	Water	PrecSep_0	
280-192407-13	MW-40B	Total/NA	Water	PrecSep_0	
280-192407-14	MW-53B2	Total/NA	Water	PrecSep_0	
280-192407-15	MW-52B	Total/NA	Water	PrecSep_0	
280-192407-16	MW-49B	Total/NA	Water	PrecSep_0	
280-192407-17	MW-38B	Total/NA	Water	PrecSep_0	
280-192407-18	MW-21B	Total/NA	Water	PrecSep_0	
280-192407-19	Dup-01	Total/NA	Water	PrecSep_0	
280-192407-20	MW-38C	Total/NA	Water	PrecSep_0	
MB 160-666171/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-666171/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
280-192407-11 MS	MW-20B	Total/NA	Water	PrecSep_0	
280-192407-11 MSD	MW-20B	Total/NA	Water	PrecSep_0	

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Prep Batch: 666173

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	PrecSep-21	
280-192407-22	MW-46B	Total/NA	Water	PrecSep-21	
MB 160-666173/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-666173/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
280-192407-22 DU	MW-46B	Total/NA	Water	PrecSep-21	

Prep Batch: 666175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-192407-21	Field Blank	Total/NA	Water	PrecSep_0	
280-192407-22	MW-46B	Total/NA	Water	PrecSep_0	
MB 160-666175/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-666175/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
280-192407-22 DU	MW-46B	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-47B
Date Collected: 06/04/24 10:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.02 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669775	07/09/24 07:40	SCB	EET SL
Total/NA	Prep	PrecSep_0			998.02 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:10	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-45B
Date Collected: 06/04/24 11:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			999.77 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669775	07/09/24 07:40	SCB	EET SL
Total/NA	Prep	PrecSep_0			999.77 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:10	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-44B
Date Collected: 06/04/24 11:42
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			997.23 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669775	07/09/24 07:41	SCB	EET SL
Total/NA	Prep	PrecSep_0			997.23 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:10	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-43B
Date Collected: 06/04/24 12:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1001.08 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669775	07/09/24 07:41	SCB	EET SL
Total/NA	Prep	PrecSep_0			1001.08 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:10	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-42B
Date Collected: 06/04/24 13:24
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-5
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.14 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			998.14 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-41B
Date Collected: 06/04/24 14:29
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-6
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			997.96 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			997.96 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-37B
Date Collected: 06/04/24 15:12
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-7
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.61 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			998.61 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-39B
Date Collected: 06/04/24 17:10
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-8
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			996.18 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			996.18 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-32B
Date Collected: 06/04/24 16:18
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-9
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			996.46 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			996.46 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-14B
Date Collected: 06/05/24 09:21
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-10
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.96 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			998.96 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-20B
Date Collected: 06/05/24 10:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-11
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.09 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:59	SCB	EET SL
Total/NA	Prep	PrecSep_0			998.09 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669231	07/03/24 12:11	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-36B
Date Collected: 06/05/24 11:36
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-12
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.90 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:58	SCB	EET SL
Total/NA	Prep	PrecSep_0			1000.90 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:17	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-40B
Date Collected: 06/05/24 12:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-13
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.47 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:58	SCB	EET SL
Total/NA	Prep	PrecSep_0			1000.47 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:17	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/09/24 13:46	SCB	EET SL

Client Sample ID: MW-53B2
Date Collected: 06/05/24 13:39
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-14
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			511.96 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:58	SCB	EET SL
Total/NA	Prep	PrecSep_0			511.96 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:17	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: MW-52B
Date Collected: 06/05/24 15:49
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-15
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			752.84 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:58	SCB	EET SL
Total/NA	Prep	PrecSep_0			752.84 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:17	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: MW-49B
Date Collected: 06/05/24 17:07
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-16
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			999.52 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669786	07/09/24 07:58	SCB	EET SL
Total/NA	Prep	PrecSep_0			999.52 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:15	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: MW-38B
Date Collected: 06/05/24 18:22
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-17
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			999.73 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669788	07/09/24 07:50	SCB	EET SL
Total/NA	Prep	PrecSep_0			999.73 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:15	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: MW-21B
Date Collected: 06/05/24 19:01
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-18
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.78 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669788	07/09/24 07:50	SCB	EET SL
Total/NA	Prep	PrecSep_0			1000.78 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:15	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: Dup-01
Date Collected: 06/05/24 00:00
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-19
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.70 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669788	07/09/24 07:50	SCB	EET SL
Total/NA	Prep	PrecSep_0			1000.70 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:16	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: MW-38C
Date Collected: 06/05/24 19:27
Date Received: 06/06/24 12:10

Lab Sample ID: 280-192407-20
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			997.66 mL	1.0 g	666170	06/13/24 08:19	MLT	EET SL
Total/NA	Analysis	9315		1			669788	07/09/24 07:50	SCB	EET SL
Total/NA	Prep	PrecSep_0			997.66 mL	1.0 g	666171	06/13/24 08:22	MLT	EET SL
Total/NA	Analysis	9320		1			669100	07/03/24 12:16	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Client Sample ID: Field Blank

Lab Sample ID: 280-192407-21

Date Collected: 06/05/24 19:30
Matrix: Water
Date Received: 06/06/24 12:10

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			999.29 mL	1.0 g	666173	06/13/24 08:24	MLT	EET SL
Total/NA	Analysis	9315		1			669598	07/08/24 21:06	SCB	EET SL
Total/NA	Prep	PrecSep_0			999.29 mL	1.0 g	666175	06/13/24 08:26	MLT	EET SL
Total/NA	Analysis	9320		1			669230	07/03/24 12:29	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Client Sample ID: MW-46B

Lab Sample ID: 280-192407-22

Date Collected: 06/05/24 20:14
Matrix: Water
Date Received: 06/06/24 12:10

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			999.39 mL	1.0 g	666173	06/13/24 08:24	MLT	EET SL
Total/NA	Analysis	9315		1			669598	07/08/24 21:06	SCB	EET SL
Total/NA	Prep	PrecSep_0			999.39 mL	1.0 g	666175	06/13/24 08:26	MLT	EET SL
Total/NA	Analysis	9320		1			669230	07/03/24 12:29	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			669483	07/10/24 14:26	SCB	EET SL

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM Technical Services Inc. Job ID: 280-192407-2
Project/Site: Basin 2024 Support

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	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
Connecticut	State	PH-0241	03-31-25
Illinois	NELAP	200023	11-30-24
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-24
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-24
New Jersey	NELAP	MO002	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-24
Oklahoma	NELAP	9997	08-31-24
Oregon	NELAP	4157	09-01-24
Pennsylvania	NELAP	68-00540	02-28-25
Texas	NELAP	T104704193	07-31-24
US Fish & Wildlife	US Federal Programs	058448	07-31-24
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-24
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-24
West Virginia DEP	State	381	10-31-24

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

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

Chain of Custody Record

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Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-140846-38645.5
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:	Page:
Company: AECOM Technical Services Inc.	PWSID:	Analysis Requested		Job #:

Address: 6200 S. Quebec Street	Due Date Requested:	Preservation Codes: D - HNO3 N - None
City: Greenwood Village	TAT Requested (days):	
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No	
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145	
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474	
Project Name: Basin 2024 Support	Project #: 28020759	
Site:	SSOW#:	Other:

280-192407 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A Total Metals	2540C_Calcd - Solids, Total Dissolved (TDS)	Total Number of contai	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-47B	6/4/24	1042	G	W			X	X	X	X	X	5	
MW-45B		1112					X	X	X	X	X	5	
MW-44B		1142					X	X	X	X	X	5	
MW-43B		1239					X	X	X	X	X	5	
MW-42B		1324					X	X	X	X	X	5	
MW-41B		1429					X	X	X	X	X	5	
MW-37B		1512					X	X	X	X	X	5	
MW-39B		1710					X	X	X	X	X	5	
MW-32B		1618					X	X	X	X	X	5	
MW-14B	6/5/24	0921					X	X	X	X	X	5	
MW-20B		1049				Y	X	X	X	X	X	5	MS/MSD

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

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

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

Special Instructions/QC Requirements:

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

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	6/6/24 1210	AECOM		06/06/24 1210	EFDEN
Relinquished by:			Received by:		
Relinquished by:			Received by:		

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.2, 3.4, 4.3, 4.4, 4.4 IR Naga CF 0.2

Ver: 04/02/2024

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

Chain of Custody Record

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Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-140846-38645.4
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:	Page:

Company: AECOM Technical Services Inc.	PWSID:	Analysis Requested	Job #:
Address: 6200 S. Quebec Street	Due Date Requested:		Preservation Codes: D - HNO3 N - None
City: Greenwood Village	TAT Requested (days):		
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No		
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145		
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474		Other:
Project Name: Basin 2024 Support	Project #: 28020759		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	90056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A Total Metals	2540C_Calcd - Solids, Total Dissolved (TDS)	Total Number of containers	Special Instructions/Note:
			Preservation Code:				D	D	N	D	N		
MW-36B	6/5/24	1136	G	W			X	X	X	X	X	5	
MW-40B		1222					X	X	X	X	X	5	
MW-53BR		1339					X	X	X	X	X	5	
MW-52B		1549					X	X	X	X	X	5	
MW-49B		1717					X	X	X	X	X	5	
MW-35B		1822					X	X	X	X	X	5	
MW-31B		1906 1901					X	X	X	X	X	5	
DUP-01		—					X	X	X	X	X	5	
MW-35C		1927					X	X	X	X	X	5	
Field Blank		1930					X	X	X	X	X	5	
MW-46B		2014					X	X	X	X	X	5	

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

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

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

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6/6/24 1210	AECOM		6/6/24	EET DEN
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 2.2, 3.4, 4.3, 4.4, 4.4 IR Noga GF 0.2

Ver: 04/02/2024

7/10/2024

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-705333.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin: Colorado	Page: Page 1 of 3
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-192407-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 7/11/2024			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-47B (280-192407-1)	6/4/24	10:42 Mountain		Water			X	X	X	2	
MW-45B (280-192407-2)	6/4/24	11:12 Mountain		Water			X	X	X	2	
MW-44B (280-192407-3)	6/4/24	11:42 Mountain		Water			X	X	X	2	
MW-43B (280-192407-4)	6/4/24	12:39 Mountain		Water			X	X	X	2	
MW-42B (280-192407-5)	6/4/24	13:24 Mountain		Water			X	X	X	2	
MW-41B (280-192407-6)	6/4/24	14:29 Mountain		Water			X	X	X	2	
MW-37B (280-192407-7)	6/4/24	15:12 Mountain		Water			X	X	X	2	
MW-39B (280-192407-8)	6/4/24	17:10 Mountain		Water			X	X	X	2	
MW-32B (280-192407-9)	6/4/24	16:18 Mountain		Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/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 attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	6/7/24 1405	EETDEN	Richard Thornley	JUN 12 2024 1008	ETA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 04/02/2024

7/10/2024

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-705333.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin: Colorado	Page: Page 2 of 3
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-192407-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 7/11/2024	Analysis Requested		Preservation Codes:
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC										Total Number of containers	Special Instructions/Note:
			Preservation Code:																	
MW-14B (280-192407-10)	6/5/24	09:21 Mountain		Water			X	X	X										2	
MW-20B (280-192407-11)	6/5/24	10:49 Mountain		Water			X	X	X										2	
MW-20B (280-192407-11MS)	6/5/24	10:49 Mountain	MS	Water			X	X											2	
MW-20B (280-192407-11MSD)	6/5/24	10:49 Mountain	MSD	Water			X	X											2	
MW-36B (280-192407-12)	6/5/24	11:36 Mountain		Water			X	X	X										2	
MW-40B (280-192407-13)	6/5/24	12:22 Mountain		Water			X	X	X										2	
MW-53B2 (280-192407-14)	6/5/24	13:39 Mountain		Water			X	X	X										2	
MW-52B (280-192407-15)	6/5/24	15:49 Mountain		Water			X	X	X										2	
MW-49B (280-192407-16)	6/5/24	17:07 Mountain		Water			X	X	X										2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/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 attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:				
Relinquished by:	Date/Time: 6/7/24 1405	Company: EDEN	Received by: Richard Thornley	Date/Time: JUN 12 2024 1008	Company: FTA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 04/02/2024

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-705333.3
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin: Colorado	Page: Page 3 of 3
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-192407-2
Address: 13715 Rider Trail North, ,	Due Date Requested: 7/11/2024			Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-38B (280-192407-17)	6/5/24	18:22 Mountain		Water			X	X	X	2	
MW-21B (280-192407-18)	6/5/24	19:01 Mountain		Water			X	X	X	2	
Dup-01 (280-192407-19)	6/5/24	Mountain		Water			X	X	X	2	
MW-38C (280-192407-20)	6/5/24	19:27 Mountain		Water			X	X	X	2	
Field Blank (280-192407-21)	6/5/24	19:30 Mountain		Water			X	X	X	2	
MW-46B (280-192407-22)	6/5/24	20:14 Mountain		Water			X	X	X	2	

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Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time: 6/7/24 1405	Company: EET DEN	Received by: Richard Thornley	Date/Time: JUN 12 2024 1008	Company: ETA STL
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 04/02/2024

7/10/2024

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 280-192407-2

Login Number: 192407
List Number: 1
Creator: Held, Wesley

List Source: Eurofins Denver

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

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 280-192407-2

Login Number: 192407
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 06/10/24 03:12 PM

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

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc.

Job Number: 280-192407-2

Login Number: 192407
List Number: 3
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 06/12/24 01:44 PM

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

Tracer/Carrier Summary

Client: AECOM Technical Services Inc.
Project/Site: Basin 2024 Support

Job ID: 280-192407-2

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
280-192407-1	MW-47B	92.8
280-192407-2	MW-45B	94.8
280-192407-3	MW-44B	96.8
280-192407-4	MW-43B	98.3
280-192407-5	MW-42B	92.3
280-192407-6	MW-41B	92.3
280-192407-7	MW-37B	92.1
280-192407-8	MW-39B	99.0
280-192407-9	MW-32B	99.3
280-192407-10	MW-14B	96.3
280-192407-11	MW-20B	99.5
280-192407-11 MS	MW-20B	99.5
280-192407-11 MSD	MW-20B	98.0
280-192407-12	MW-36B	95.3
280-192407-13	MW-40B	91.8
280-192407-14	MW-53B2	97.5
280-192407-15	MW-52B	94.8
280-192407-16	MW-49B	95.0
280-192407-17	MW-38B	91.6
280-192407-18	MW-21B	81.9
280-192407-19	Dup-01	94.3
280-192407-20	MW-38C	96.3
280-192407-21	Field Blank	97.5
280-192407-22	MW-46B	96.8
280-192407-22 DU	MW-46B	97.3
LCS 160-666170/2-A	Lab Control Sample	95.8
LCS 160-666173/2-A	Lab Control Sample	100
MB 160-666170/1-A	Method Blank	96.0
MB 160-666173/1-A	Method Blank	95.8

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
280-192407-1	MW-47B	92.8	86.0
280-192407-2	MW-45B	94.8	83.4
280-192407-3	MW-44B	96.8	82.6
280-192407-4	MW-43B	98.3	83.4
280-192407-5	MW-42B	92.3	81.5
280-192407-6	MW-41B	92.3	84.5
280-192407-7	MW-37B	92.1	84.5
280-192407-8	MW-39B	99.0	83.0
280-192407-9	MW-32B	99.3	82.6
280-192407-10	MW-14B	96.3	83.7
280-192407-11	MW-20B	99.5	83.7

Tracer/Carrier Summary

Client: AECOM Technical Services Inc.
Job ID: 280-192407-2
Project/Site: Basin 2024 Support

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

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)									
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)								
280-192407-11 MS	MW-20B	99.5	85.6								
280-192407-11 MSD	MW-20B	98.0	83.4								
280-192407-12	MW-36B	95.3	83.0								
280-192407-13	MW-40B	91.8	84.1								
280-192407-14	MW-53B2	97.5	83.7								
280-192407-15	MW-52B	94.8	84.9								
280-192407-16	MW-49B	95.0	82.2								
280-192407-17	MW-38B	91.6	79.6								
280-192407-18	MW-21B	81.9	84.9								
280-192407-19	Dup-01	94.3	85.6								
280-192407-20	MW-38C	96.3	84.1								
280-192407-21	Field Blank	97.5	84.9								
280-192407-22	MW-46B	96.8	85.6								
280-192407-22 DU	MW-46B	97.3	86.0								
LCS 160-666171/2-A	Lab Control Sample	95.8	84.5								
LCS 160-666175/2-A	Lab Control Sample	100	88.6								
MB 160-666171/1-A	Method Blank	96.0	83.4								
MB 160-666175/1-A	Method Blank	95.8	86.7								

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

eurofins | Environment Testing

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

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Katie Abbott
AECOM Technical Services Inc
6200 S. Quebec Street
Greenwood Village, Colorado 80111

Generated 10/10/2024 3:10:52 PM

JOB DESCRIPTION

Basin 2024 Support

JOB NUMBER

280-197290-2

Eurofins Denver
4955 Yarrow Street
Arvada CO 80002

See page two for job notes and contact information.

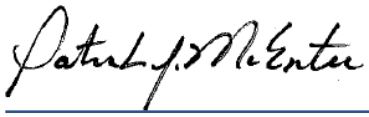
my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



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Authorized for release by
Patrick McEntee, Client Service Manager
Patrick.McEntee@et.eurofinsus.com
(303)736-0107

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Definitions/Glossary

Client: AECOM Technical Services Inc
Job ID: 280-197290-2
Project/Site: Basin 2024 Support

Qualifiers

Metals

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

General Chemistry

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
☼	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job Narrative
280-197290-2

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/27/2024 4:30 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 1.4°C, 1.9°C, 2.7°C, 3.4°C, 3.9°C and 4.3°C.

Receipt Exceptions
Client canceled the request for pH analysis indicating that this is a field method and should not have been included on the COC. 280-197290-1, 280-197290-2, 280-197290-3, 280-197290-4, 280-197290-5, 280-197290-6, 280-197290-7, 280-197290-8, 280-197290-9, 280-197290-10, 280-197290-11, 280-197290-12, 280-197290-13, 280-197290-14, 280-197290-15, 280-197290-16, 280-197290-17, 280-197290-18, 280-197290-18[MS], 280-197290-18[MSD], 280-197290-19, 280-197290-20, 280-197290-21 and 280-197290-22

Method 6010D - Metals (ICP)
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Metals (ICP). The samples were prepared on 10/1/2024 and 10/2/2024 and analyzed on 10/1/2024 and 10/3/2024.

Due to the high concentration of Ca, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 280-669233 and analytical batch 280-669422 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria. 280-197290-18[MSD]

Method 6020B - Metals (ICP/MS)
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Metals (ICP/MS). The samples were prepared on 10/1/2024 and 10/2/2024 and analyzed on 10/1/2024, 10/2/2024 and 10/3/2024.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 280-669233 and analytical batch 280-669419 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits.280-197290-18[MS]

Method 7470A - Mercury (CVAA)

Job ID: 280-197290-2 (Continued) Eurofins Denver

Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Mercury (CVAA). The samples were prepared on 10/2/2024 and analyzed on 10/2/2024 and 10/3/2024.

Method SM 2540C - Solids, Total Dissolved (TDS)
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Solids, Total Dissolved (TDS). The samples were analyzed on 9/30/2024, 10/1/2024 and 10/4/2024.

The method blank for 669287 contained Total Dissolved Solids (TDS) above the method detection limit (MDL). Associated samples were not re-analyzed because results were greater than 10X the value found in the method blank.

Method 9056A - Anions, Ion Chromatography
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Anions, Ion Chromatography. The samples were analyzed on 10/2/2024, 10/3/2024 and 10/4/2024.

Samples MW-14B-09252024 (280-197290-1)[5x], MW-20B-09252024 (280-197290-2)[5x], MW-37B-09252024 (280-197290-3)[5x], MW-49B-09252024 (280-197290-4)[5x], MW-53BR-09262024 (280-197290-5)[5x], MW-52B-09262024 (280-197290-6)[5x], MW-32B-09262024 (280-197290-7)[10x], MW-39B-09262024 (280-197290-8)[5x], MW-40B-09262024 (280-197290-9)[5x], MW-41B-09262024 (280-197290-10)[5x], MW-47B-09262024 (280-197290-11)[5x], MW-45B-09262024 (280-197290-12)[5x], MW-44B-09262024 (280-197290-13)[5x], MW-42B-09262024 (280-197290-14)[10x], MW-43B-09262024 (280-197290-15)[5x], MW-46B-09272024 (280-197290-16)[5x], MW-36B-09272024 (280-197290-17)[5x], MW-21B-09272024 (280-197290-18)[20x], MW-21B-09272024 (280-197290-18MS)[20x], MW-21B-09272024 (280-197290-18MSD)[20x], MW-38B-09272024 (280-197290-19)[10x], MW-38B-09272024 (280-197290-19)[50x], DUP-01-09272024 (280-197290-20)[10x], DUP-01-09272024 (280-197290-20)[50x] and MW-38C-09272024 (280-197290-21)[5x] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-669489 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits. The associated samples are: 280-197290-18[MS] and 280-197290-18[MSD].

The matrix spike / matrix spike duplicate (MS/MSD) recoveries for analytical batch 280-669489 were outside control limits for one or more analytes. See QC Sample Results for detail. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery is within acceptance limits. The associated samples are: 280-197290-E-9 MS and 280-197290-E-9 MSD.

Detection Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-2

Client Sample ID: MW-14B-09252024 — Lab Sample ID: 280-197290-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	186		100	1.45	ug/L	1		6010D	Total/NA
Calcium	161000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	32.1		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.87	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	52.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	4.84		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	7.74		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	0.284	J	1.00	0.230	ug/L	1		6020B	Total/NA
Selenium	10.2		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	70.7		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.593		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	363		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	958		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-20B-09252024 — Lab Sample ID: 280-197290-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	254		100	1.45	ug/L	1		6010D	Total/NA
Calcium	149000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	44.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.27	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	55.8		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.572	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	8.92		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	2.58	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	48.4		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.794		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	411		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	957		10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-37B-09252024 — Lab Sample ID: 280-197290-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	186		100	1.45	ug/L	1		6010D	Total/NA
Calcium	207000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	41.6		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.33	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	62.1		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	2.47	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	37.6		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.58		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	80.7		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.603		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	554		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1200		20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-49B-09252024 — Lab Sample ID: 280-197290-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	204		100	1.45	ug/L	1		6010D	Total/NA
Calcium	143000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	48.1		20.0	9.10	ug/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins Denver

Client Sample ID: MW-49B-09252024 (Continued) — Lab Sample ID: 280-197290-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	2.89	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	56.1		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.688	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	2.96		2.00	0.370	ug/L	1		6020B	Total/NA
Chloride	27.7		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.609		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	358		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	820	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-53BR-09262024 — Lab Sample ID: 280-197290-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	125		100	1.45	ug/L	1		6010D	Total/NA
Calcium	121000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	59.7		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	1.58	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	88.4		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	3.14		1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	3.08		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	11.1		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	0.619	J	1.00	0.230	ug/L	1		6020B	Total/NA
Selenium	8.48		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	39.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	1.03		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	261		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	753	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-52B-09262024 — Lab Sample ID: 280-197290-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	167		100	1.45	ug/L	1		6010D	Total/NA
Calcium	141000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	65.1		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.92	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	116		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	5.84		1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	4.58		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	9.94		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	0.924	J	1.00	0.230	ug/L	1		6020B	Total/NA
Antimony	1.18	J	2.00	0.400	ug/L	1		6020B	Total/NA
Selenium	1.17	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	53.3		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.378	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	466		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	928	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-32B-09262024 — Lab Sample ID: 280-197290-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	324		100	1.45	ug/L	1		6010D	Total/NA
Calcium	249000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	85.9		20.0	9.10	ug/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-32B-09262024 (Continued) — Lab Sample ID: 280-197290-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	1.49	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	31.9		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.846	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	2.78		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	2.18	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	126		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.530		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	1090		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2050	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-39B-09262024 — Lab Sample ID: 280-197290-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	183		100	1.45	ug/L	1		6010D	Total/NA
Calcium	151000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	66.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.20	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	30.1		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.840	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	4.18		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.54	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	51.6		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.704		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	530		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1180	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-40B-09262024 — Lab Sample ID: 280-197290-9

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	176		100	1.45	ug/L	1		6010D	Total/NA
Calcium	138000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	55.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	5.52		5.00	0.500	ug/L	1		6020B	Total/NA
Barium	27.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.603	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	6.57		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.53		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	35.9		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.936		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	277		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	874	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-41B-09262024 — Lab Sample ID: 280-197290-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	893		100	1.45	ug/L	1		6010D	Total/NA
Calcium	102000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	44.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	4.60	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	20.0		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.586	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	5.66		3.00	0.500	ug/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-41B-09262024 (Continued) — Lab Sample ID: 280-197290-10

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Molybdenum	84.3		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.85		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	66.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.638		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	569		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1130	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-47B-09262024 — Lab Sample ID: 280-197290-11

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	150		100	1.45	ug/L	1		6010D	Total/NA
Calcium	130000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	36.1		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.97	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	75.6		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	6.26		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	5.70		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.15	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	36.8		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.480	J	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	340		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	756	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-45B-09262024 — Lab Sample ID: 280-197290-12

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	204		100	1.45	ug/L	1		6010D	Total/NA
Calcium	162000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	44.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.52	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	46.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	1.29	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	7.08		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	8.03		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	54.7		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.858		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	391		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	852	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-44B-09262024 — Lab Sample ID: 280-197290-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	115		100	1.45	ug/L	1		6010D	Total/NA
Calcium	186000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	40.0		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.09	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	50.5		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	4.57		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	6.20		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	7.85		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	64.4		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.811		0.500	0.165	mg/L	1		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-44B-09262024 (Continued) — Lab Sample ID: 280-197290-13

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	466		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1060	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-42B-09262024 — Lab Sample ID: 280-197290-14

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	742		100	1.45	ug/L	1		6010D	Total/NA
Calcium	309000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	63.5		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	4.49	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	20.0		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	2.09	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	27.0		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	16.2		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	219		30.0	10.2	mg/L	10		9056A	Total/NA
Fluoride	0.632		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	1310		50.0	10.3	mg/L	10		9056A	Total/NA
Total Dissolved Solids (TDS)	2280	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-43B-09262024 — Lab Sample ID: 280-197290-15

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	264		100	1.45	ug/L	1		6010D	Total/NA
Calcium	227000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	53.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.12	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	58.8		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	2.78	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	9.88		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	3.14	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	126		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.552		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	920		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	1680	B	20.0	9.40	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-46B-09272024 — Lab Sample ID: 280-197290-16

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	85.6	J	100	1.45	ug/L	1		6010D	Total/NA
Calcium	113000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	37.9		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.76	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	59.2		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	10.3		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	3.40		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.31	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	46.6		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.763		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	298		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	702	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-2

Client Sample ID: MW-36B-09272024 — Lab Sample ID: 280-197290-17

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	128		100	1.45	ug/L	1		6010D	Total/NA
Calcium	131000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	43.8		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.09	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	70.4		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	0.841	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	7.62		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	9.80		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	48.5		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.734		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	378		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	848	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-21B-09272024 — Lab Sample ID: 280-197290-18

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	283		100	1.45	ug/L	1		6010D	Total/NA
Calcium	689000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	78.2		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.51	J F1	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	49.2		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	5.34		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	88.0		2.00	0.370	ug/L	1		6020B	Total/NA
Lead	0.246	J	1.00	0.230	ug/L	1		6020B	Total/NA
Selenium	11.7	F1	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	636		60.0	20.4	mg/L	20		9056A	Total/NA
Fluoride	0.665	F1	0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	1970		100	20.6	mg/L	20		9056A	Total/NA
Total Dissolved Solids (TDS)	3690		100	47.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-38B-09272024 — Lab Sample ID: 280-197290-19

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3080		100	1.45	ug/L	1		6010D	Total/NA
Calcium	476000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	115		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.80	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	15.8		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.508	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	6.94		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	189		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.66	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	275		30.0	10.2	mg/L	10		9056A	Total/NA
Fluoride	0.538		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	5560		250	51.5	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7330	B	100	47.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: DUP-01-09272024 — Lab Sample ID: 280-197290-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	3120		100	1.45	ug/L	1		6010D	Total/NA
Calcium	486000		200	24.1	ug/L	1		6010D	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: DUP-01-09272024 (Continued) — Lab Sample ID: 280-197290-20

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Lithium	113		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	3.82	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	15.5		3.00	0.380	ug/L	1		6020B	Total/NA
Cobalt	0.469	J	1.00	0.330	ug/L	1		6020B	Total/NA
Chromium	7.02		3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	188		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	4.31	J	5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	279		30.0	10.2	mg/L	10		9056A	Total/NA
Fluoride	0.548		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	5730		250	51.5	mg/L	50		9056A	Total/NA
Total Dissolved Solids (TDS)	7290	B	100	47.0	mg/L	1		SM 2540C	Total/NA

Client Sample ID: MW-38C-09272024 — Lab Sample ID: 280-197290-21

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	62.7	J B	100	1.45	ug/L	1		6010D	Total/NA
Calcium	102000		200	24.1	ug/L	1		6010D	Total/NA
Lithium	31.9		20.0	9.10	ug/L	1		6010D	Total/NA
Arsenic	2.58	J	5.00	0.500	ug/L	1		6020B	Total/NA
Barium	40.9		3.00	0.380	ug/L	1		6020B	Total/NA
Chromium	1.15	J	3.00	0.500	ug/L	1		6020B	Total/NA
Molybdenum	5.18		2.00	0.370	ug/L	1		6020B	Total/NA
Selenium	5.07		5.00	1.00	ug/L	1		6020B	Total/NA
Chloride	33.1		3.00	1.02	mg/L	1		9056A	Total/NA
Fluoride	0.669		0.500	0.165	mg/L	1		9056A	Total/NA
Sulfate	257		25.0	5.15	mg/L	5		9056A	Total/NA
Total Dissolved Solids (TDS)	653	B	10.0	4.70	mg/L	1		SM 2540C	Total/NA

Client Sample ID: EB-09272024 — Lab Sample ID: 280-197290-22

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Calcium	137	J	200	24.1	ug/L	1		6010D	Total/NA
Barium	1.01	J	3.00	0.380	ug/L	1		6020B	Total/NA
Total Dissolved Solids (TDS)	20.0		10.0	4.70	mg/L	1		SM 2540C	Total/NA

This Detection Summary does not include radiochemical test results.

Method Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-2

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET DEN
6020B	Metals (ICP/MS)	SW846	EET DEN
7470A	Mercury (CVAA)	SW846	EET DEN
9056A	Anions, Ion Chromatography	SW846	EET DEN
SM 2540C	Solids, Total Dissolved (TDS)	SM	EET DEN
3010A	Preparation, Total Metals	SW846	EET DEN
3020A	Preparation, Total Metals	SW846	EET DEN
7470A	Preparation, Mercury	SW846	EET 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:

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

Sample Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-197290-1	MW-14B-09252024	Water	09/25/24 14:45	09/27/24 16:30
280-197290-2	MW-20B-09252024	Water	09/25/24 15:40	09/27/24 16:30
280-197290-3	MW-37B-09252024	Water	09/25/24 16:20	09/27/24 16:30
280-197290-4	MW-49B-09252024	Water	09/25/24 17:30	09/27/24 16:30
280-197290-5	MW-53BR-09262024	Water	09/26/24 12:45	09/27/24 16:30
280-197290-6	MW-52B-09262024	Water	09/26/24 13:20	09/27/24 16:30
280-197290-7	MW-32B-09262024	Water	09/26/24 14:30	09/27/24 16:30
280-197290-8	MW-39B-09262024	Water	09/26/24 15:15	09/27/24 16:30
280-197290-9	MW-40B-09262024	Water	09/26/24 15:50	09/27/24 16:30
280-197290-10	MW-41B-09262024	Water	09/26/24 16:40	09/27/24 16:30
280-197290-11	MW-47B-09262024	Water	09/26/24 17:20	09/27/24 16:30
280-197290-12	MW-45B-09262024	Water	09/26/24 18:00	09/27/24 16:30
280-197290-13	MW-44B-09262024	Water	09/26/24 18:35	09/27/24 16:30
280-197290-14	MW-42B-09262024	Water	09/26/24 09:20	09/27/24 16:30
280-197290-15	MW-43B-09262024	Water	09/26/24 10:00	09/27/24 16:30
280-197290-16	MW-46B-09272024	Water	09/27/24 09:00	09/27/24 16:30
280-197290-17	MW-36B-09272024	Water	09/27/24 09:35	09/27/24 16:30
280-197290-18	MW-21B-09272024	Water	09/27/24 10:00	09/27/24 16:30
280-197290-19	MW-38B-09272024	Water	09/27/24 11:00	09/27/24 16:30
280-197290-20	DUP-01-09272024	Water	09/27/24 00:00	09/27/24 16:30
280-197290-21	MW-38C-09272024	Water	09/27/24 11:45	09/27/24 16:30
280-197290-22	EB-09272024	Water	09/27/24 12:00	09/27/24 16:30

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	186		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:09	1
Calcium	161000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:09	1
Lithium	32.1		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:09	1

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	254		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:28	1
Calcium	149000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:28	1
Lithium	44.2		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:28	1

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	186		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:32	1
Calcium	207000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:32	1
Lithium	41.6		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:32	1

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	204		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:36	1
Calcium	143000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:36	1
Lithium	48.1		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:36	1

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	125		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:40	1
Calcium	121000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:40	1
Lithium	59.7		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:40	1

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	167		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:44	1
Calcium	141000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:44	1
Lithium	65.1		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:44	1

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	324		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:48	1
Calcium	249000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:48	1
Lithium	85.9		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:48	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	183		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:51	1
Calcium	151000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:51	1
Lithium	66.8		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:51	1

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	176		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:55	1
Calcium	138000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:55	1
Lithium	55.8		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:55	1

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	893		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:59	1
Calcium	102000		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:59	1
Lithium	44.8		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:59	1

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	150		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:03	1
Calcium	130000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:03	1
Lithium	36.1		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:03	1

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	204		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:23	1
Calcium	162000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:23	1
Lithium	44.2		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:23	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	115		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:27	1
Calcium	186000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:27	1
Lithium	40.0		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:27	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	742		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:30	1
Calcium	309000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:30	1
Lithium	63.5		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:30	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	264		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:34	1
Calcium	227000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:34	1
Lithium	53.8		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:34	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	85.6	J	100	1.45	ug/L		10/01/24 08:13	10/01/24 20:38	1
Calcium	113000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:38	1
Lithium	37.9		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:38	1

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	128		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:42	1
Calcium	131000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:42	1
Lithium	43.8		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:42	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	283		100	1.45	ug/L		10/01/24 08:13	10/01/24 20:46	1
Calcium	689000		200	24.1	ug/L		10/01/24 08:13	10/01/24 20:46	1
Lithium	78.2		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 20:46	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3080		100	1.45	ug/L		10/01/24 08:13	10/01/24 21:20	1
Calcium	476000		200	24.1	ug/L		10/01/24 08:13	10/01/24 21:20	1
Lithium	115		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 21:20	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3120		100	1.45	ug/L		10/01/24 08:13	10/01/24 21:25	1
Calcium	486000		200	24.1	ug/L		10/01/24 08:13	10/01/24 21:25	1
Lithium	113		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 21:25	1

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	62.7	J B	100	1.45	ug/L		10/02/24 15:02	10/03/24 18:46	1
Calcium	102000		200	24.1	ug/L		10/02/24 15:02	10/03/24 18:46	1
Lithium	31.9		20.0	9.10	ug/L		10/02/24 15:02	10/03/24 18:46	1

Method: SW846 6010D - Metals (ICP)

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	1.45	ug/L		10/02/24 15:02	10/03/24 18:50	1
Calcium	**137**	**J**	200	24.1	ug/L		10/02/24 15:02	10/03/24 18:50	1
Lithium	ND		20.0	9.10	ug/L		10/02/24 15:02	10/03/24 18:50	1

Method: SW846 6020B - Metals (ICP/MS)

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.87**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:25	1
Barium	**52.4**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:25	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:25	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:25	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:25	1
Chromium	**4.84**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:25	1
Molybdenum	**7.74**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:25	1
Lead	**0.284**	**J**	1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:25	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:25	1
Selenium	**10.2**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:25	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:25	1

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.27**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:27	1
Barium	**55.8**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:27	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:27	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:27	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:27	1
Chromium	**0.572**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:27	1
Molybdenum	**8.92**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:27	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:27	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:27	1
Selenium	**2.58**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:27	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:27	1

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.33**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:29	1
Barium	**62.1**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:29	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:29	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:29	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:29	1
Chromium	**2.47**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:29	1
Molybdenum	**37.6**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:29	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:29	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:29	1
Selenium	**5.58**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:29	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:29	1

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.89**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:32	1
Barium	**56.1**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:32	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:32	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:32	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:32	1
Chromium	**0.688**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:32	1
Molybdenum	**2.96**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:32	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:32	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:32	1
Selenium	ND		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:32	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:32	1

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.58**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:34	1
Barium	**88.4**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:34	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:34	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:34	1
Cobalt	**3.14**		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:34	1
Chromium	**3.08**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:34	1
Molybdenum	**11.1**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:34	1
Lead	**0.619**	**J**	1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:34	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:34	1
Selenium	**8.48**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:34	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:34	1

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.92**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:37	1
Barium	**116**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:37	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:37	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:37	1
Cobalt	**5.84**		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:37	1
Chromium	**4.58**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:37	1
Molybdenum	**9.94**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:37	1
Lead	**0.924**	**J**	1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:37	1
Antimony	**1.18**	**J**	2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:37	1
Selenium	**1.17**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:37	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:37	1

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**1.49**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:39	1
Barium	**31.9**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:39	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:39	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:39	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:39	1
Chromium	**0.846**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:39	1
Molybdenum	**2.78**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:39	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:39	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:39	1
Selenium	**2.18**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:39	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:39	1

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.20**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:41	1
Barium	**30.1**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:41	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:41	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:41	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:41	1
Chromium	**0.840**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:41	1
Molybdenum	**4.18**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:41	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:41	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:41	1
Selenium	**4.54**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:41	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:41	1

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**5.52**		5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:48	1
Barium	**27.4**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:48	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:48	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:48	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:48	1
Chromium	**0.603**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:48	1
Molybdenum	**6.57**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:48	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:48	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:48	1
Selenium	**5.53**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:48	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:48	1

Method: SW846 6020B - Metals (ICP/MS)

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.60**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:51	1
Barium	**20.0**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:51	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:51	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:51	1
Cobalt	**0.586**	**J**	1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:51	1
Chromium	**5.66**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:51	1
Molybdenum	**84.3**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:51	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:51	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:51	1
Selenium	**5.85**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:51	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:51	1

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.97**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:53	1
Barium	**75.6**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:53	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:53	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:53	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:53	1
Chromium	**6.26**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:53	1
Molybdenum	**5.70**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:53	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:53	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:53	1
Selenium	**4.15**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:53	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:53	1

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.52**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:55	1
Barium	**46.4**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:55	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:55	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:55	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:55	1
Chromium	**1.29**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:55	1
Molybdenum	**7.08**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:55	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:55	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:55	1
Selenium	**8.03**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:55	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:55	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.09**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:58	1
Barium	**50.5**		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:58	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:58	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:58	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:58	1
Chromium	**4.57**		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:58	1
Molybdenum	**6.20**		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:58	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:58	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:58	1
Selenium	**7.85**		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:58	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:58	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**4.49**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:00	1
Barium	**20.0**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:00	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 00:00	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:00	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:00	1
Chromium	**2.09**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:00	1
Molybdenum	**27.0**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:00	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:00	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:00	1
Selenium	**16.2**		5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:00	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:00	1

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.12**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:02	1
Barium	**58.8**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:02	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 00:02	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:02	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:02	1
Chromium	**2.78**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:02	1
Molybdenum	**9.88**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:02	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:02	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:02	1
Selenium	**3.14**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:02	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:02	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.76**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:05	1
Barium	**59.2**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:05	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 00:05	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:05	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:05	1
Chromium	**10.3**		3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:05	1
Molybdenum	**3.40**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:05	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:05	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:05	1
Selenium	**4.31**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:05	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:05	1

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.09**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:07	1
Barium	**70.4**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:07	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 00:07	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:07	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:07	1
Chromium	**0.841**	**J**	3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:07	1
Molybdenum	**7.62**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:07	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:07	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:07	1
Selenium	**9.80**		5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:07	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:07	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.51**	**J F1**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:14	1
Barium	**49.2**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:14	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 11:33	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:14	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:14	1
Chromium	**5.34**		3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:14	1
Molybdenum	**88.0**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:14	1
Lead	**0.246**	**J**	1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:14	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:14	1
Selenium	**11.7**	**F1**	5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:14	1
Thallium	ND	F1	1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:14	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.80**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:26	1
Barium	**15.8**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:26	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 11:44	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:26	1
Cobalt	**0.508**	**J**	1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:26	1
Chromium	**6.94**		3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:26	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Molybdenum	**189**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:26	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:26	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:26	1
Selenium	**4.66**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:26	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:26	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**3.82**	**J**	5.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:28	1
Barium	**15.5**		3.00	0.380	ug/L		10/01/24 08:13	10/02/24 00:28	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/02/24 11:47	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/02/24 00:28	1
Cobalt	**0.469**	**J**	1.00	0.330	ug/L		10/01/24 08:13	10/02/24 00:28	1
Chromium	**7.02**		3.00	0.500	ug/L		10/01/24 08:13	10/02/24 00:28	1
Molybdenum	**188**		2.00	0.370	ug/L		10/01/24 08:13	10/02/24 00:28	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/02/24 00:28	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/02/24 00:28	1
Selenium	**4.31**	**J**	5.00	1.00	ug/L		10/01/24 08:13	10/02/24 00:28	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/02/24 00:28	1

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**2.58**	**J**	5.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:54	1
Barium	**40.9**		3.00	0.380	ug/L		10/02/24 15:02	10/03/24 09:54	1
Beryllium	ND		1.00	0.303	ug/L		10/02/24 15:02	10/03/24 09:54	1
Cadmium	ND		1.00	0.190	ug/L		10/02/24 15:02	10/03/24 09:54	1
Cobalt	ND		1.00	0.330	ug/L		10/02/24 15:02	10/03/24 09:54	1
Chromium	**1.15**	**J**	3.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:54	1
Molybdenum	**5.18**		2.00	0.370	ug/L		10/02/24 15:02	10/03/24 09:54	1
Lead	ND		1.00	0.230	ug/L		10/02/24 15:02	10/03/24 09:54	1
Antimony	ND		2.00	0.400	ug/L		10/02/24 15:02	10/03/24 09:54	1
Selenium	**5.07**		5.00	1.00	ug/L		10/02/24 15:02	10/03/24 09:54	1
Thallium	ND		1.00	0.210	ug/L		10/02/24 15:02	10/03/24 09:54	1

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:56	1
Barium	**1.01**	**J**	3.00	0.380	ug/L		10/02/24 15:02	10/03/24 09:56	1
Beryllium	ND		1.00	0.303	ug/L		10/02/24 15:02	10/03/24 09:56	1
Cadmium	ND		1.00	0.190	ug/L		10/02/24 15:02	10/03/24 09:56	1
Cobalt	ND		1.00	0.330	ug/L		10/02/24 15:02	10/03/24 09:56	1
Chromium	ND		3.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:56	1
Molybdenum	ND		2.00	0.370	ug/L		10/02/24 15:02	10/03/24 09:56	1
Lead	ND		1.00	0.230	ug/L		10/02/24 15:02	10/03/24 09:56	1

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	ND		2.00	0.400	ug/L		10/02/24 15:02	10/03/24 09:56	1
Selenium	ND		5.00	1.00	ug/L		10/02/24 15:02	10/03/24 09:56	1
Thallium	ND		1.00	0.210	ug/L		10/02/24 15:02	10/03/24 09:56	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 22:59	1

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:02	1

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:04	1

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:07	1

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:10	1

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:12	1

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:15	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:17	1

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:25	1

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:27	1

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:30	1

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:32	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:35	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:37	1

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:40	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30
Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:43	1

Method: SW846 7470A - Mercury (CVAA)

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:45	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 23:48	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/03/24 00:00	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/03/24 00:03	1

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 17:14	10/03/24 00:10	1

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 17:14	10/03/24 00:13	1

General Chemistry

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	70.7		3.00	1.02	mg/L			10/02/24 22:51	1
Fluoride (SW846 9056A)	0.593		0.500	0.165	mg/L			10/02/24 22:51	1
Sulfate (SW846 9056A)	363		25.0	5.15	mg/L			10/02/24 23:02	5
Total Dissolved Solids (TDS) (SM 2540C)	958		20.0	9.40	mg/L			09/30/24 09:36	1

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	48.4		3.00	1.02	mg/L			10/02/24 23:13	1
Fluoride (SW846 9056A)	0.794		0.500	0.165	mg/L			10/02/24 23:13	1
Sulfate (SW846 9056A)	411		25.0	5.15	mg/L			10/02/24 23:24	5

General Chemistry (Continued)

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS) (SM 2540C)	957		10.0	4.70	mg/L			09/30/24 09:36	1

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	80.7		3.00	1.02	mg/L			10/02/24 23:35	1
Fluoride (SW846 9056A)	0.603		0.500	0.165	mg/L			10/02/24 23:35	1
Sulfate (SW846 9056A)	554		25.0	5.15	mg/L			10/03/24 00:08	5
Total Dissolved Solids (TDS) (SM 2540C)	1200		20.0	9.40	mg/L			09/30/24 09:36	1

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	27.7		3.00	1.02	mg/L			10/03/24 00:19	1
Fluoride (SW846 9056A)	0.609		0.500	0.165	mg/L			10/03/24 00:19	1
Sulfate (SW846 9056A)	358		25.0	5.15	mg/L			10/03/24 00:30	5
Total Dissolved Solids (TDS) (SM 2540C)	820	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	39.8		3.00	1.02	mg/L			10/03/24 00:41	1
Fluoride (SW846 9056A)	1.03		0.500	0.165	mg/L			10/03/24 00:41	1
Sulfate (SW846 9056A)	261		25.0	5.15	mg/L			10/03/24 00:52	5
Total Dissolved Solids (TDS) (SM 2540C)	753	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	53.3		3.00	1.02	mg/L			10/03/24 01:03	1
Fluoride (SW846 9056A)	0.378	J	0.500	0.165	mg/L			10/03/24 01:03	1
Sulfate (SW846 9056A)	466		25.0	5.15	mg/L			10/03/24 01:14	5
Total Dissolved Solids (TDS) (SM 2540C)	928	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	126		3.00	1.02	mg/L			10/03/24 01:25	1
Fluoride (SW846 9056A)	0.530		0.500	0.165	mg/L			10/03/24 01:25	1
Sulfate (SW846 9056A)	1090		50.0	10.3	mg/L			10/03/24 01:36	10
Total Dissolved Solids (TDS) (SM 2540C)	2050	B	20.0	9.40	mg/L			10/01/24 09:12	1

General Chemistry

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	51.6		3.00	1.02	mg/L			10/03/24 03:37	1
Fluoride (SW846 9056A)	0.704		0.500	0.165	mg/L			10/03/24 03:37	1
Sulfate (SW846 9056A)	530		25.0	5.15	mg/L			10/03/24 03:48	5
Total Dissolved Solids (TDS) (SM 2540C)	1180	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	35.9		3.00	1.02	mg/L			10/02/24 21:23	1
Fluoride (SW846 9056A)	0.936		0.500	0.165	mg/L			10/02/24 21:23	1
Sulfate (SW846 9056A)	277		25.0	5.15	mg/L			10/04/24 23:29	5
Total Dissolved Solids (TDS) (SM 2540C)	874	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	66.8		3.00	1.02	mg/L			10/03/24 03:59	1
Fluoride (SW846 9056A)	0.638		0.500	0.165	mg/L			10/03/24 03:59	1
Sulfate (SW846 9056A)	569		25.0	5.15	mg/L			10/03/24 04:10	5
Total Dissolved Solids (TDS) (SM 2540C)	1130	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	36.8		3.00	1.02	mg/L			10/03/24 04:21	1
Fluoride (SW846 9056A)	0.480	J	0.500	0.165	mg/L			10/03/24 04:21	1
Sulfate (SW846 9056A)	340		25.0	5.15	mg/L			10/03/24 04:32	5
Total Dissolved Solids (TDS) (SM 2540C)	756	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	54.7		3.00	1.02	mg/L			10/03/24 04:43	1
Fluoride (SW846 9056A)	0.858		0.500	0.165	mg/L			10/03/24 04:43	1
Sulfate (SW846 9056A)	391		25.0	5.15	mg/L			10/03/24 04:54	5
Total Dissolved Solids (TDS) (SM 2540C)	852	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	64.4		3.00	1.02	mg/L			10/03/24 05:05	1
Fluoride (SW846 9056A)	0.811		0.500	0.165	mg/L			10/03/24 05:05	1

General Chemistry (Continued)

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate (SW846 9056A)	466		25.0	5.15	mg/L			10/03/24 05:38	5
Total Dissolved Solids (TDS) (SM 2540C)	1060	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	219		30.0	10.2	mg/L			10/03/24 05:59	10
Fluoride (SW846 9056A)	0.632		0.500	0.165	mg/L			10/03/24 05:49	1
Sulfate (SW846 9056A)	1310		50.0	10.3	mg/L			10/03/24 05:59	10
Total Dissolved Solids (TDS) (SM 2540C)	2280	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	126		3.00	1.02	mg/L			10/03/24 06:10	1
Fluoride (SW846 9056A)	0.552		0.500	0.165	mg/L			10/03/24 06:10	1
Sulfate (SW846 9056A)	920		25.0	5.15	mg/L			10/03/24 06:21	5
Total Dissolved Solids (TDS) (SM 2540C)	1680	B	20.0	9.40	mg/L			10/01/24 09:12	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	46.6		3.00	1.02	mg/L			10/03/24 06:32	1
Fluoride (SW846 9056A)	0.763		0.500	0.165	mg/L			10/03/24 06:32	1
Sulfate (SW846 9056A)	298		25.0	5.15	mg/L			10/03/24 06:43	5
Total Dissolved Solids (TDS) (SM 2540C)	702	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	48.5		3.00	1.02	mg/L			10/03/24 06:54	1
Fluoride (SW846 9056A)	0.734		0.500	0.165	mg/L			10/03/24 06:54	1
Sulfate (SW846 9056A)	378		25.0	5.15	mg/L			10/03/24 07:05	5
Total Dissolved Solids (TDS) (SM 2540C)	848	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	636		60.0	20.4	mg/L			10/03/24 02:53	20
Fluoride (SW846 9056A)	0.665	F1	0.500	0.165	mg/L			10/03/24 01:47	1
Sulfate (SW846 9056A)	1970		100	20.6	mg/L			10/03/24 02:53	20

General Chemistry (Continued)

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS) (SM 2540C)	3690		100	47.0	mg/L			10/04/24 09:07	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	275		30.0	10.2	mg/L			10/03/24 09:17	10
Fluoride (SW846 9056A)	0.538		0.500	0.165	mg/L			10/03/24 09:06	1
Sulfate (SW846 9056A)	5560		250	51.5	mg/L			10/03/24 09:28	50
Total Dissolved Solids (TDS) (SM 2540C)	7330	B	100	47.0	mg/L			10/01/24 09:12	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	279		30.0	10.2	mg/L			10/03/24 09:50	10
Fluoride (SW846 9056A)	0.548		0.500	0.165	mg/L			10/03/24 09:39	1
Sulfate (SW846 9056A)	5730		250	51.5	mg/L			10/03/24 10:01	50
Total Dissolved Solids (TDS) (SM 2540C)	7290	B	100	47.0	mg/L			10/01/24 09:12	1

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	33.1		3.00	1.02	mg/L			10/03/24 10:12	1
Fluoride (SW846 9056A)	0.669		0.500	0.165	mg/L			10/03/24 10:12	1
Sulfate (SW846 9056A)	257		25.0	5.15	mg/L			10/03/24 10:23	5
Total Dissolved Solids (TDS) (SM 2540C)	653	B	10.0	4.70	mg/L			10/01/24 09:12	1

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride (SW846 9056A)	ND		3.00	1.02	mg/L			10/03/24 07:49	1
Fluoride (SW846 9056A)	ND		0.500	0.165	mg/L			10/03/24 07:49	1
Sulfate (SW846 9056A)	ND		5.00	1.03	mg/L			10/03/24 07:49	1
Total Dissolved Solids (TDS) (SM 2540C)	20.0		10.0	4.70	mg/L			10/01/24 09:14	1

Method: 6010D - Metals (ICP)

Lab Sample ID: MB 280-669233/1-A
Matrix: Water
Analysis Batch: 669422

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	ND		100	1.45	ug/L		10/01/24 08:13	10/01/24 19:01	1
Calcium	ND		200	24.1	ug/L		10/01/24 08:13	10/01/24 19:01	1
Lithium	ND		20.0	9.10	ug/L		10/01/24 08:13	10/01/24 19:01	1

Lab Sample ID: LCS 280-669233/2-A
Matrix: Water
Analysis Batch: 669422

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	2077		ug/L		104	86 - 110
Calcium	50000	52370		ug/L		105	90 - 111
Lithium	1000	1011		ug/L		101	90 - 112

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669422

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	283		2000	2466		ug/L		109	87 - 113
Calcium	689000		50000	715900	4	ug/L		54	75 - 125
Lithium	78.2		1000	1108		ug/L		103	89 - 114

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669422

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Boron	283		2000	2470		ug/L		109	87 - 113	0	20
Calcium	689000		50000	732400	4	ug/L		87	75 - 125	2	20
Lithium	78.2		1000	1109		ug/L		103	89 - 114	0	20

Lab Sample ID: MB 280-669240/1-A
Matrix: Water
Analysis Batch: 669773

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669240

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	3.486	J	100	1.45	ug/L		10/02/24 15:02	10/03/24 17:47	1
Calcium	ND		200	24.1	ug/L		10/02/24 15:02	10/03/24 17:47	1
Lithium	ND		20.0	9.10	ug/L		10/02/24 15:02	10/03/24 17:47	1

Lab Sample ID: LCS 280-669240/2-A
Matrix: Water
Analysis Batch: 669773

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669240

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Boron	2000	1989		ug/L		99	86 - 110
Calcium	50000	50080		ug/L		100	90 - 111
Lithium	1000	946.9		ug/L		95	90 - 112

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 280-669233/1-A
Matrix: Water
Analysis Batch: 669419

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669233

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:20	1
Barium	ND		3.00	0.380	ug/L		10/01/24 08:13	10/01/24 23:20	1
Beryllium	ND		1.00	0.303	ug/L		10/01/24 08:13	10/01/24 23:20	1
Cadmium	ND		1.00	0.190	ug/L		10/01/24 08:13	10/01/24 23:20	1
Cobalt	ND		1.00	0.330	ug/L		10/01/24 08:13	10/01/24 23:20	1
Chromium	ND		3.00	0.500	ug/L		10/01/24 08:13	10/01/24 23:20	1
Molybdenum	ND		2.00	0.370	ug/L		10/01/24 08:13	10/01/24 23:20	1
Lead	ND		1.00	0.230	ug/L		10/01/24 08:13	10/01/24 23:20	1
Antimony	ND		2.00	0.400	ug/L		10/01/24 08:13	10/01/24 23:20	1
Selenium	ND		5.00	1.00	ug/L		10/01/24 08:13	10/01/24 23:20	1
Thallium	ND		1.00	0.210	ug/L		10/01/24 08:13	10/01/24 23:20	1

Lab Sample ID: LCS 280-669233/25-A
Matrix: Water
Analysis Batch: 669419

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	40.0	36.45		ug/L		91	85 - 117
Barium	40.0	38.99		ug/L		97	85 - 118
Beryllium	40.0	36.43		ug/L		91	80 - 125
Cadmium	40.0	38.32		ug/L		96	85 - 115
Cobalt	40.0	40.80		ug/L		102	85 - 120
Chromium	40.0	40.96		ug/L		102	84 - 121
Molybdenum	40.0	37.83		ug/L		95	85 - 119
Lead	40.0	38.54		ug/L		96	85 - 118
Antimony	40.0	37.41		ug/L		94	85 - 115
Selenium	40.0	39.63		ug/L		99	77 - 122
Thallium	40.0	38.40		ug/L		96	85 - 118

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669419

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	2.51	J F1	40.0	38.83	F1	ug/L		91	92 - 112
Barium	49.2		40.0	87.93		ug/L		97	92 - 117
Cadmium	ND		40.0	36.93		ug/L		92	91 - 114
Cobalt	ND		40.0	38.92		ug/L		97	94 - 115
Chromium	5.34		40.0	44.21		ug/L		97	91 - 114
Molybdenum	88.0		40.0	126.3		ug/L		96	84 - 117
Lead	0.246	J	40.0	38.24		ug/L		95	95 - 116
Antimony	ND		40.0	37.30		ug/L		93	80 - 111
Selenium	11.7	F1	40.0	45.80	F1	ug/L		85	90 - 115
Thallium	ND	F1	40.0	37.13	F1	ug/L		93	94 - 115

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

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669498

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	ND		40.0	39.00		ug/L		98	87 - 118

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669419

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	2.51	J F1	40.0	39.08	F1	ug/L		91	92 - 112	1	20
Barium	49.2		40.0	89.02		ug/L		100	92 - 117	1	20
Cadmium	ND		40.0	37.59		ug/L		94	91 - 114	2	20
Cobalt	ND		40.0	39.28		ug/L		98	94 - 115	1	20
Chromium	5.34		40.0	45.46		ug/L		100	91 - 114	3	20
Molybdenum	88.0		40.0	127.4		ug/L		98	84 - 117	1	20
Lead	0.246	J	40.0	38.55		ug/L		96	95 - 116	1	20
Antimony	ND		40.0	37.46		ug/L		94	80 - 111	0	20
Selenium	11.7	F1	40.0	51.25		ug/L		99	90 - 115	11	20
Thallium	ND	F1	40.0	38.13		ug/L		95	94 - 115	3	20

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669498

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669233

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Beryllium	ND		40.0	38.87		ug/L		97	87 - 118	0	20

Lab Sample ID: MB 280-669240/1-A
Matrix: Water
Analysis Batch: 669658

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669240

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	ND		5.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:11	1
Barium	ND		3.00	0.380	ug/L		10/02/24 15:02	10/03/24 09:11	1
Beryllium	ND		1.00	0.303	ug/L		10/02/24 15:02	10/03/24 09:11	1
Cadmium	ND		1.00	0.190	ug/L		10/02/24 15:02	10/03/24 09:11	1
Cobalt	ND		1.00	0.330	ug/L		10/02/24 15:02	10/03/24 09:11	1
Chromium	ND		3.00	0.500	ug/L		10/02/24 15:02	10/03/24 09:11	1
Molybdenum	ND		2.00	0.370	ug/L		10/02/24 15:02	10/03/24 09:11	1
Lead	ND		1.00	0.230	ug/L		10/02/24 15:02	10/03/24 09:11	1
Antimony	ND		2.00	0.400	ug/L		10/02/24 15:02	10/03/24 09:11	1
Selenium	ND		5.00	1.00	ug/L		10/02/24 15:02	10/03/24 09:11	1
Thallium	ND		1.00	0.210	ug/L		10/02/24 15:02	10/03/24 09:11	1

Lab Sample ID: LCS 280-669240/22-A
Matrix: Water
Analysis Batch: 669658

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669240

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	40.0	38.10		ug/L		95	85 - 117
Barium	40.0	37.28		ug/L		93	85 - 118

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

Lab Sample ID: LCS 280-669240/22-A
Matrix: Water
Analysis Batch: 669658

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669240

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Beryllium	40.0	36.29		ug/L		91	80 - 125
Cadmium	40.0	37.38		ug/L		93	85 - 115
Cobalt	40.0	36.70		ug/L		92	85 - 120
Chromium	40.0	38.00		ug/L		95	84 - 121
Molybdenum	40.0	37.12		ug/L		93	85 - 119
Lead	40.0	36.73		ug/L		92	85 - 118
Antimony	40.0	37.33		ug/L		93	85 - 115
Selenium	40.0	39.66		ug/L		99	77 - 122
Thallium	40.0	37.36		ug/L		93	85 - 118

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 280-669530/1-A
Matrix: Water
Analysis Batch: 669715

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669530

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 19:27	10/02/24 22:54	1

Lab Sample ID: LCS 280-669530/2-A
Matrix: Water
Analysis Batch: 669715

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669530

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.004952		mg/L		99	84 - 120

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669715

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669530

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	ND		0.00500	0.004710		mg/L		94	75 - 125

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669715

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 669530

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	ND		0.00500	0.004750		mg/L		95	75 - 125	1	20

Lab Sample ID: MB 280-669533/1-A
Matrix: Water
Analysis Batch: 669715

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 669533

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	ND		0.000200	0.0000610	mg/L		10/02/24 17:14	10/03/24 00:05	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 280-669533/2-A
Matrix: Water
Analysis Batch: 669715

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 669533

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.004997		mg/L		100	84 - 120

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 280-669489/13
Matrix: Water
Analysis Batch: 669489

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			10/02/24 21:12	1
Fluoride	ND		0.500	0.165	mg/L			10/02/24 21:12	1
Sulfate	ND		5.00	1.03	mg/L			10/02/24 21:12	1

Lab Sample ID: MB 280-669489/70
Matrix: Water
Analysis Batch: 669489

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	ND		3.00	1.02	mg/L			10/03/24 07:38	1
Fluoride	ND		0.500	0.165	mg/L			10/03/24 07:38	1
Sulfate	ND		5.00	1.03	mg/L			10/03/24 07:38	1

Lab Sample ID: LCS 280-669489/11
Matrix: Water
Analysis Batch: 669489

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	100	103.9		mg/L		104	90 - 110
Fluoride	5.00	4.947		mg/L		99	90 - 110
Sulfate	100	103.6		mg/L		104	90 - 110

Lab Sample ID: LCS 280-669489/68
Matrix: Water
Analysis Batch: 669489

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	100	107.6		mg/L		108	90 - 110
Fluoride	5.00	5.474		mg/L		109	90 - 110
Sulfate	100	109.0		mg/L		109	90 - 110

Lab Sample ID: LCSD 280-669489/12
Matrix: Water
Analysis Batch: 669489

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	100	104.0		mg/L		104	90 - 110	0	10
Fluoride	5.00	4.940		mg/L		99	90 - 110	0	10
Sulfate	100	103.5		mg/L		103	90 - 110	0	10

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

Lab Sample ID: LCSD 280-669489/69
Matrix: Water
Analysis Batch: 669489

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride			100	107.9		mg/L		108	90 - 110	0	10
Fluoride			5.00	5.387		mg/L		108	90 - 110	2	10
Sulfate			100	108.8		mg/L		109	90 - 110	0	10

Lab Sample ID: MRL 280-669489/10
Matrix: Water
Analysis Batch: 669489

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

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride			5.00	4.995		mg/L		100	50 - 150		
Fluoride			0.500	0.4400	J	mg/L		88	50 - 150		
Sulfate			5.00	4.482	J	mg/L		90	50 - 150		

Lab Sample ID: 280-197290-9 MS
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-40B-09262024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	35.9		50.0	87.85		mg/L		104	80 - 120		
Fluoride	0.936		5.00	5.939		mg/L		100	80 - 120		

Lab Sample ID: 280-197290-9 MSD
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-40B-09262024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	35.9		50.0	88.90		mg/L		106	80 - 120	1	20
Fluoride	0.936		5.00	6.045		mg/L		102	80 - 120	2	20

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride	0.665	F1	5.00	4.617	F1	mg/L		79	80 - 120		

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chloride	636		1000	1687		mg/L		105	80 - 120		
Sulfate	1970		1000	2989		mg/L		102	80 - 120		

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	0.665	F1	5.00	4.625	F1	mg/L		79	80 - 120	0	20

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	636		1000	1701		mg/L		106	80 - 120	1	20
Sulfate	1970		1000	2991		mg/L		102	80 - 120	0	20

Lab Sample ID: 280-197290-22 MS
Matrix: Water
Analysis Batch: 669489

Client Sample ID: EB-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	ND		50.0	51.89		mg/L		104	80 - 120
Fluoride	ND		5.00	4.861		mg/L		97	80 - 120
Sulfate	ND		50.0	51.32		mg/L		103	80 - 120

Lab Sample ID: 280-197290-22 MSD
Matrix: Water
Analysis Batch: 669489

Client Sample ID: EB-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chloride	ND		50.0	50.83		mg/L		102	80 - 120	2	20
Fluoride	ND		5.00	4.744		mg/L		95	80 - 120	2	20
Sulfate	ND		50.0	50.26		mg/L		101	80 - 120	2	20

Lab Sample ID: 280-197290-9 DU
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-40B-09262024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	35.9		35.80		mg/L		0.2	15
Fluoride	0.936		0.9395		mg/L		0.4	15

Lab Sample ID: 280-197290-18 DU
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Fluoride	0.665	F1	0.6674		mg/L		0.4	15

Lab Sample ID: 280-197290-18 DU
Matrix: Water
Analysis Batch: 669489

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	636		624.7		mg/L		2	15
Sulfate	1970		1935		mg/L		2	15

Lab Sample ID: 280-197290-22 DU
Matrix: Water
Analysis Batch: 669489

Client Sample ID: EB-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Chloride	ND		ND		mg/L		NC	15

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

Lab Sample ID: 280-197290-22 DU
Matrix: Water
Analysis Batch: 669489

Client Sample ID: EB-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Fluoride	ND			ND		mg/L				NC	15
Sulfate	ND			ND		mg/L				NC	15

Lab Sample ID: MB 280-669803/6
Matrix: Water
Analysis Batch: 669803

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.00	1.03	mg/L			10/04/24 11:06	1

Lab Sample ID: MB 280-669803/61
Matrix: Water
Analysis Batch: 669803

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	ND		5.00	1.03	mg/L			10/05/24 03:31	1

Lab Sample ID: LCS 280-669803/4
Matrix: Water
Analysis Batch: 669803

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			100	103.5		mg/L		103	90 - 110		

Lab Sample ID: LCS 280-669803/59
Matrix: Water
Analysis Batch: 669803

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfate			100	105.5		mg/L		105	90 - 110		

Lab Sample ID: LCSD 280-669803/5
Matrix: Water
Analysis Batch: 669803

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate			100	103.6		mg/L		104	90 - 110	0	10

Lab Sample ID: LCSD 280-669803/60
Matrix: Water
Analysis Batch: 669803

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

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfate			100	105.5		mg/L		106	90 - 110	0	10

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

Lab Sample ID: MRL 280-669803/3
Matrix: Water
Analysis Batch: 669803

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

Analyte	Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits
Sulfate	5.00	4.588	J	mg/L		92	50 - 150

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

Lab Sample ID: MB 280-669129/1
Matrix: Water
Analysis Batch: 669129

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			09/30/24 09:36	1

Lab Sample ID: LCS 280-669129/2
Matrix: Water
Analysis Batch: 669129

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids (TDS)	501	493.0		mg/L		98	88 - 114

Lab Sample ID: MB 280-669287/1
Matrix: Water
Analysis Batch: 669287

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	5.000	J	10.0	4.70	mg/L			10/01/24 09:12	1

Lab Sample ID: LCS 280-669287/2
Matrix: Water
Analysis Batch: 669287

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Dissolved Solids (TDS)	501	492.0		mg/L		98	88 - 114

Lab Sample ID: 280-197290-21 DU
Matrix: Water
Analysis Batch: 669287

Client Sample ID: MW-38C-09272024
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Dissolved Solids (TDS)	653	B	642.0		mg/L		2	10

Lab Sample ID: MB 280-669288/1
Matrix: Water
Analysis Batch: 669288

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			10/01/24 09:14	1

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

Lab Sample ID: LCS 280-669288/2
Matrix: Water
Analysis Batch: 669288

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			501	517.0		mg/L		103	88 - 114		

Lab Sample ID: MB 280-669782/1
Matrix: Water
Analysis Batch: 669782

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Dissolved Solids (TDS)	ND		10.0	4.70	mg/L			10/04/24 09:07	1

Lab Sample ID: LCS 280-669782/2
Matrix: Water
Analysis Batch: 669782

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Dissolved Solids (TDS)			503	509.0		mg/L		101	88 - 114		

Metals

Prep Batch: 669233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	3020A	
280-197290-2	MW-20B-09252024	Total/NA	Water	3020A	
280-197290-3	MW-37B-09252024	Total/NA	Water	3020A	
280-197290-4	MW-49B-09252024	Total/NA	Water	3020A	
280-197290-5	MW-53BR-09262024	Total/NA	Water	3020A	
280-197290-6	MW-52B-09262024	Total/NA	Water	3020A	
280-197290-7	MW-32B-09262024	Total/NA	Water	3020A	
280-197290-8	MW-39B-09262024	Total/NA	Water	3020A	
280-197290-9	MW-40B-09262024	Total/NA	Water	3020A	
280-197290-10	MW-41B-09262024	Total/NA	Water	3020A	
280-197290-11	MW-47B-09262024	Total/NA	Water	3020A	
280-197290-12	MW-45B-09262024	Total/NA	Water	3020A	
280-197290-13	MW-44B-09262024	Total/NA	Water	3020A	
280-197290-14	MW-42B-09262024	Total/NA	Water	3020A	
280-197290-15	MW-43B-09262024	Total/NA	Water	3020A	
280-197290-16	MW-46B-09272024	Total/NA	Water	3020A	
280-197290-17	MW-36B-09272024	Total/NA	Water	3020A	
280-197290-18	MW-21B-09272024	Total/NA	Water	3010A	
280-197290-18	MW-21B-09272024	Total/NA	Water	3020A	
280-197290-19	MW-38B-09272024	Total/NA	Water	3020A	
280-197290-20	DUP-01-09272024	Total/NA	Water	3020A	
MB 280-669233/1-A	Method Blank	Total/NA	Water	3010A	
LCS 280-669233/25-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 280-669233/2-A	Lab Control Sample	Total/NA	Water	3010A	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	3010A	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	3020A	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	3010A	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	3020A	

Prep Batch: 669240

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	3020A	
280-197290-22	EB-09272024	Total/NA	Water	3020A	
MB 280-669240/1-A	Method Blank	Total/NA	Water	3010A	
LCS 280-669240/22-A	Lab Control Sample	Total/NA	Water	3010A	
LCS 280-669240/2-A	Lab Control Sample	Total/NA	Water	3010A	

Analysis Batch: 669419

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	6020B	669233
280-197290-2	MW-20B-09252024	Total/NA	Water	6020B	669233
280-197290-3	MW-37B-09252024	Total/NA	Water	6020B	669233
280-197290-4	MW-49B-09252024	Total/NA	Water	6020B	669233
280-197290-5	MW-53BR-09262024	Total/NA	Water	6020B	669233
280-197290-6	MW-52B-09262024	Total/NA	Water	6020B	669233
280-197290-7	MW-32B-09262024	Total/NA	Water	6020B	669233
280-197290-8	MW-39B-09262024	Total/NA	Water	6020B	669233
280-197290-9	MW-40B-09262024	Total/NA	Water	6020B	669233
280-197290-10	MW-41B-09262024	Total/NA	Water	6020B	669233
280-197290-11	MW-47B-09262024	Total/NA	Water	6020B	669233
280-197290-12	MW-45B-09262024	Total/NA	Water	6020B	669233

Metals (Continued)

Analysis Batch: 669419 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-13	MW-44B-09262024	Total/NA	Water	6020B	669233
280-197290-14	MW-42B-09262024	Total/NA	Water	6020B	669233
280-197290-15	MW-43B-09262024	Total/NA	Water	6020B	669233
280-197290-16	MW-46B-09272024	Total/NA	Water	6020B	669233
280-197290-17	MW-36B-09272024	Total/NA	Water	6020B	669233
280-197290-18	MW-21B-09272024	Total/NA	Water	6020B	669233
280-197290-19	MW-38B-09272024	Total/NA	Water	6020B	669233
280-197290-20	DUP-01-09272024	Total/NA	Water	6020B	669233
MB 280-669233/1-A	Method Blank	Total/NA	Water	6020B	669233
LCS 280-669233/25-A	Lab Control Sample	Total/NA	Water	6020B	669233
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	6020B	669233
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	6020B	669233

Analysis Batch: 669422

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	6010D	669233
280-197290-2	MW-20B-09252024	Total/NA	Water	6010D	669233
280-197290-3	MW-37B-09252024	Total/NA	Water	6010D	669233
280-197290-4	MW-49B-09252024	Total/NA	Water	6010D	669233
280-197290-5	MW-53BR-09262024	Total/NA	Water	6010D	669233
280-197290-6	MW-52B-09262024	Total/NA	Water	6010D	669233
280-197290-7	MW-32B-09262024	Total/NA	Water	6010D	669233
280-197290-8	MW-39B-09262024	Total/NA	Water	6010D	669233
280-197290-9	MW-40B-09262024	Total/NA	Water	6010D	669233
280-197290-10	MW-41B-09262024	Total/NA	Water	6010D	669233
280-197290-11	MW-47B-09262024	Total/NA	Water	6010D	669233
280-197290-12	MW-45B-09262024	Total/NA	Water	6010D	669233
280-197290-13	MW-44B-09262024	Total/NA	Water	6010D	669233
280-197290-14	MW-42B-09262024	Total/NA	Water	6010D	669233
280-197290-15	MW-43B-09262024	Total/NA	Water	6010D	669233
280-197290-16	MW-46B-09272024	Total/NA	Water	6010D	669233
280-197290-17	MW-36B-09272024	Total/NA	Water	6010D	669233
280-197290-18	MW-21B-09272024	Total/NA	Water	6010D	669233
280-197290-19	MW-38B-09272024	Total/NA	Water	6010D	669233
280-197290-20	DUP-01-09272024	Total/NA	Water	6010D	669233
MB 280-669233/1-A	Method Blank	Total/NA	Water	6010D	669233
LCS 280-669233/2-A	Lab Control Sample	Total/NA	Water	6010D	669233
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	6010D	669233
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	6010D	669233

Analysis Batch: 669498

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-18	MW-21B-09272024	Total/NA	Water	6020B	669233
280-197290-19	MW-38B-09272024	Total/NA	Water	6020B	669233
280-197290-20	DUP-01-09272024	Total/NA	Water	6020B	669233
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	6020B	669233
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	6020B	669233

Prep Batch: 669530

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	7470A	

Metals (Continued)

Prep Batch: 669530 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-2	MW-20B-09252024	Total/NA	Water	7470A	
280-197290-3	MW-37B-09252024	Total/NA	Water	7470A	
280-197290-4	MW-49B-09252024	Total/NA	Water	7470A	
280-197290-5	MW-53BR-09262024	Total/NA	Water	7470A	
280-197290-6	MW-52B-09262024	Total/NA	Water	7470A	
280-197290-7	MW-32B-09262024	Total/NA	Water	7470A	
280-197290-8	MW-39B-09262024	Total/NA	Water	7470A	
280-197290-9	MW-40B-09262024	Total/NA	Water	7470A	
280-197290-10	MW-41B-09262024	Total/NA	Water	7470A	
280-197290-11	MW-47B-09262024	Total/NA	Water	7470A	
280-197290-12	MW-45B-09262024	Total/NA	Water	7470A	
280-197290-13	MW-44B-09262024	Total/NA	Water	7470A	
280-197290-14	MW-42B-09262024	Total/NA	Water	7470A	
280-197290-15	MW-43B-09262024	Total/NA	Water	7470A	
280-197290-16	MW-46B-09272024	Total/NA	Water	7470A	
280-197290-17	MW-36B-09272024	Total/NA	Water	7470A	
280-197290-18	MW-21B-09272024	Total/NA	Water	7470A	
280-197290-19	MW-38B-09272024	Total/NA	Water	7470A	
280-197290-20	DUP-01-09272024	Total/NA	Water	7470A	
MB 280-669530/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-669530/2-A	Lab Control Sample	Total/NA	Water	7470A	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	7470A	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	7470A	

Prep Batch: 669533

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	7470A	
280-197290-22	EB-09272024	Total/NA	Water	7470A	
MB 280-669533/1-A	Method Blank	Total/NA	Water	7470A	
LCS 280-669533/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 669658

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	6020B	669240
280-197290-22	EB-09272024	Total/NA	Water	6020B	669240
MB 280-669240/1-A	Method Blank	Total/NA	Water	6020B	669240
LCS 280-669240/22-A	Lab Control Sample	Total/NA	Water	6020B	669240

Analysis Batch: 669715

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	7470A	669530
280-197290-2	MW-20B-09252024	Total/NA	Water	7470A	669530
280-197290-3	MW-37B-09252024	Total/NA	Water	7470A	669530
280-197290-4	MW-49B-09252024	Total/NA	Water	7470A	669530
280-197290-5	MW-53BR-09262024	Total/NA	Water	7470A	669530
280-197290-6	MW-52B-09262024	Total/NA	Water	7470A	669530
280-197290-7	MW-32B-09262024	Total/NA	Water	7470A	669530
280-197290-8	MW-39B-09262024	Total/NA	Water	7470A	669530
280-197290-9	MW-40B-09262024	Total/NA	Water	7470A	669530
280-197290-10	MW-41B-09262024	Total/NA	Water	7470A	669530
280-197290-11	MW-47B-09262024	Total/NA	Water	7470A	669530

Metals (Continued)

Analysis Batch: 669715 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-12	MW-45B-09262024	Total/NA	Water	7470A	669530
280-197290-13	MW-44B-09262024	Total/NA	Water	7470A	669530
280-197290-14	MW-42B-09262024	Total/NA	Water	7470A	669530
280-197290-15	MW-43B-09262024	Total/NA	Water	7470A	669530
280-197290-16	MW-46B-09272024	Total/NA	Water	7470A	669530
280-197290-17	MW-36B-09272024	Total/NA	Water	7470A	669530
280-197290-18	MW-21B-09272024	Total/NA	Water	7470A	669530
280-197290-19	MW-38B-09272024	Total/NA	Water	7470A	669530
280-197290-20	DUP-01-09272024	Total/NA	Water	7470A	669530
280-197290-21	MW-38C-09272024	Total/NA	Water	7470A	669533
280-197290-22	EB-09272024	Total/NA	Water	7470A	669533
MB 280-669530/1-A	Method Blank	Total/NA	Water	7470A	669530
MB 280-669533/1-A	Method Blank	Total/NA	Water	7470A	669533
LCS 280-669530/2-A	Lab Control Sample	Total/NA	Water	7470A	669530
LCS 280-669533/2-A	Lab Control Sample	Total/NA	Water	7470A	669533
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	7470A	669530
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	7470A	669530

Analysis Batch: 669773

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	6010D	669240
280-197290-22	EB-09272024	Total/NA	Water	6010D	669240
MB 280-669240/1-A	Method Blank	Total/NA	Water	6010D	669240
LCS 280-669240/2-A	Lab Control Sample	Total/NA	Water	6010D	669240

General Chemistry

Analysis Batch: 669129

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	SM 2540C	
280-197290-2	MW-20B-09252024	Total/NA	Water	SM 2540C	
280-197290-3	MW-37B-09252024	Total/NA	Water	SM 2540C	
MB 280-669129/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-669129/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 669287

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-4	MW-49B-09252024	Total/NA	Water	SM 2540C	
280-197290-5	MW-53BR-09262024	Total/NA	Water	SM 2540C	
280-197290-6	MW-52B-09262024	Total/NA	Water	SM 2540C	
280-197290-7	MW-32B-09262024	Total/NA	Water	SM 2540C	
280-197290-8	MW-39B-09262024	Total/NA	Water	SM 2540C	
280-197290-9	MW-40B-09262024	Total/NA	Water	SM 2540C	
280-197290-10	MW-41B-09262024	Total/NA	Water	SM 2540C	
280-197290-11	MW-47B-09262024	Total/NA	Water	SM 2540C	
280-197290-12	MW-45B-09262024	Total/NA	Water	SM 2540C	
280-197290-13	MW-44B-09262024	Total/NA	Water	SM 2540C	
280-197290-14	MW-42B-09262024	Total/NA	Water	SM 2540C	
280-197290-15	MW-43B-09262024	Total/NA	Water	SM 2540C	
280-197290-16	MW-46B-09272024	Total/NA	Water	SM 2540C	
280-197290-17	MW-36B-09272024	Total/NA	Water	SM 2540C	

General Chemistry (Continued)

Analysis Batch: 669287 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-19	MW-38B-09272024	Total/NA	Water	SM 2540C	
280-197290-20	DUP-01-09272024	Total/NA	Water	SM 2540C	
280-197290-21	MW-38C-09272024	Total/NA	Water	SM 2540C	
MB 280-669287/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-669287/2	Lab Control Sample	Total/NA	Water	SM 2540C	
280-197290-21 DU	MW-38C-09272024	Total/NA	Water	SM 2540C	

Analysis Batch: 669288

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-22	EB-09272024	Total/NA	Water	SM 2540C	
MB 280-669288/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-669288/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 669489

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	9056A	
280-197290-1	MW-14B-09252024	Total/NA	Water	9056A	
280-197290-2	MW-20B-09252024	Total/NA	Water	9056A	
280-197290-2	MW-20B-09252024	Total/NA	Water	9056A	
280-197290-3	MW-37B-09252024	Total/NA	Water	9056A	
280-197290-3	MW-37B-09252024	Total/NA	Water	9056A	
280-197290-4	MW-49B-09252024	Total/NA	Water	9056A	
280-197290-4	MW-49B-09252024	Total/NA	Water	9056A	
280-197290-5	MW-53BR-09262024	Total/NA	Water	9056A	
280-197290-5	MW-53BR-09262024	Total/NA	Water	9056A	
280-197290-6	MW-52B-09262024	Total/NA	Water	9056A	
280-197290-6	MW-52B-09262024	Total/NA	Water	9056A	
280-197290-7	MW-32B-09262024	Total/NA	Water	9056A	
280-197290-7	MW-32B-09262024	Total/NA	Water	9056A	
280-197290-8	MW-39B-09262024	Total/NA	Water	9056A	
280-197290-8	MW-39B-09262024	Total/NA	Water	9056A	
280-197290-9	MW-40B-09262024	Total/NA	Water	9056A	
280-197290-10	MW-41B-09262024	Total/NA	Water	9056A	
280-197290-10	MW-41B-09262024	Total/NA	Water	9056A	
280-197290-11	MW-47B-09262024	Total/NA	Water	9056A	
280-197290-11	MW-47B-09262024	Total/NA	Water	9056A	
280-197290-12	MW-45B-09262024	Total/NA	Water	9056A	
280-197290-12	MW-45B-09262024	Total/NA	Water	9056A	
280-197290-13	MW-44B-09262024	Total/NA	Water	9056A	
280-197290-13	MW-44B-09262024	Total/NA	Water	9056A	
280-197290-14	MW-42B-09262024	Total/NA	Water	9056A	
280-197290-14	MW-42B-09262024	Total/NA	Water	9056A	
280-197290-15	MW-43B-09262024	Total/NA	Water	9056A	
280-197290-15	MW-43B-09262024	Total/NA	Water	9056A	
280-197290-16	MW-46B-09272024	Total/NA	Water	9056A	
280-197290-16	MW-46B-09272024	Total/NA	Water	9056A	
280-197290-17	MW-36B-09272024	Total/NA	Water	9056A	
280-197290-17	MW-36B-09272024	Total/NA	Water	9056A	
280-197290-18	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-18	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-19	MW-38B-09272024	Total/NA	Water	9056A	

General Chemistry (Continued)

Analysis Batch: 669489 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-19	MW-38B-09272024	Total/NA	Water	9056A	
280-197290-19	MW-38B-09272024	Total/NA	Water	9056A	
280-197290-20	DUP-01-09272024	Total/NA	Water	9056A	
280-197290-20	DUP-01-09272024	Total/NA	Water	9056A	
280-197290-20	DUP-01-09272024	Total/NA	Water	9056A	
280-197290-21	MW-38C-09272024	Total/NA	Water	9056A	
280-197290-21	MW-38C-09272024	Total/NA	Water	9056A	
280-197290-22	EB-09272024	Total/NA	Water	9056A	
MB 280-669489/13	Method Blank	Total/NA	Water	9056A	
MB 280-669489/70	Method Blank	Total/NA	Water	9056A	
LCS 280-669489/11	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-669489/68	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-669489/12	Lab Control Sample Dup	Total/NA	Water	9056A	
LCSD 280-669489/69	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-669489/10	Lab Control Sample	Total/NA	Water	9056A	
280-197290-9 MS	MW-40B-09262024	Total/NA	Water	9056A	
280-197290-9 MSD	MW-40B-09262024	Total/NA	Water	9056A	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-22 MS	EB-09272024	Total/NA	Water	9056A	
280-197290-22 MSD	EB-09272024	Total/NA	Water	9056A	
280-197290-9 DU	MW-40B-09262024	Total/NA	Water	9056A	
280-197290-18 DU	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-18 DU	MW-21B-09272024	Total/NA	Water	9056A	
280-197290-22 DU	EB-09272024	Total/NA	Water	9056A	

Analysis Batch: 669782

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-18	MW-21B-09272024	Total/NA	Water	SM 2540C	
MB 280-669782/1	Method Blank	Total/NA	Water	SM 2540C	
LCS 280-669782/2	Lab Control Sample	Total/NA	Water	SM 2540C	

Analysis Batch: 669803

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-9	MW-40B-09262024	Total/NA	Water	9056A	
MB 280-669803/6	Method Blank	Total/NA	Water	9056A	
MB 280-669803/61	Method Blank	Total/NA	Water	9056A	
LCS 280-669803/4	Lab Control Sample	Total/NA	Water	9056A	
LCS 280-669803/59	Lab Control Sample	Total/NA	Water	9056A	
LCSD 280-669803/5	Lab Control Sample Dup	Total/NA	Water	9056A	
LCSD 280-669803/60	Lab Control Sample Dup	Total/NA	Water	9056A	
MRL 280-669803/3	Lab Control Sample	Total/NA	Water	9056A	

Lab Chronicle

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-2

Client Sample ID: MW-14B-09252024

Lab Sample ID: 280-197290-1

Date Collected: 09/25/24 14:45

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:09	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:25	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 22:59	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/02/24 22:51	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/02/24 23:02	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669129	09/30/24 09:36	BRD	EET DEN

Client Sample ID: MW-20B-09252024

Lab Sample ID: 280-197290-2

Date Collected: 09/25/24 15:40

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:28	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:27	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:02	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/02/24 23:13	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/02/24 23:24	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669129	09/30/24 09:36	BRD	EET DEN

Client Sample ID: MW-37B-09252024

Lab Sample ID: 280-197290-3

Date Collected: 09/25/24 16:20

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:32	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:29	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:04	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/02/24 23:35	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 00:08	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669129	09/30/24 09:36	BRD	EET DEN

Client Sample ID: MW-49B-09252024

Lab Sample ID: 280-197290-4

Date Collected: 09/25/24 17:30

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:36	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:32	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:07	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 00:19	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 00:30	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-53BR-09262024

Lab Sample ID: 280-197290-5

Date Collected: 09/26/24 12:45

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:40	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:34	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:10	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 00:41	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 00:52	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-52B-09262024

Lab Sample ID: 280-197290-6

Date Collected: 09/26/24 13:20

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:44	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:37	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:12	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 01:03	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 01:14	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-32B-09262024

Lab Sample ID: 280-197290-7

Date Collected: 09/26/24 14:30

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:48	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:39	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:15	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 01:25	IRC	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	669489	10/03/24 01:36	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-39B-09262024

Lab Sample ID: 280-197290-8

Date Collected: 09/26/24 15:15

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:51	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:41	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:17	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 03:37	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 03:48	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-40B-09262024

Lab Sample ID: 280-197290-9

Date Collected: 09/26/24 15:50

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:55	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:48	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:25	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/02/24 21:23	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669803	10/04/24 23:29	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-41B-09262024

Lab Sample ID: 280-197290-10

Date Collected: 09/26/24 16:40

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 19:59	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:51	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:27	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 03:59	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 04:10	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-47B-09262024

Lab Sample ID: 280-197290-11

Date Collected: 09/26/24 17:20

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:03	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:53	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:30	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 04:21	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 04:32	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-45B-09262024

Lab Sample ID: 280-197290-12

Date Collected: 09/26/24 18:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:23	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:55	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:32	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 04:43	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 04:54	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-44B-09262024

Lab Sample ID: 280-197290-13

Date Collected: 09/26/24 18:35

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:27	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/01/24 23:58	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:35	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 05:05	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 05:38	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-42B-09262024

Lab Sample ID: 280-197290-14

Date Collected: 09/26/24 09:20

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:30	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:00	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:37	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 05:49	IRC	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	669489	10/03/24 05:59	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-43B-09262024

Lab Sample ID: 280-197290-15

Date Collected: 09/26/24 10:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:34	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:02	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:40	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 06:10	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 06:21	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	50 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-46B-09272024

Lab Sample ID: 280-197290-16

Date Collected: 09/27/24 09:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:38	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:05	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:43	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 06:32	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 06:43	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-36B-09272024

Lab Sample ID: 280-197290-17

Date Collected: 09/27/24 09:35

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:42	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:07	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:45	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 06:54	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 07:05	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-21B-09272024

Lab Sample ID: 280-197290-18

Date Collected: 09/27/24 10:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3010A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 20:46	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:14	LMT	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669498	10/02/24 11:33	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/02/24 23:48	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 01:47	IRC	EET DEN
Total/NA	Analysis	9056A		20	10 mL	10 mL	669489	10/03/24 02:53	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	669782	10/04/24 09:07	BRD	EET DEN

Client Sample ID: MW-38B-09272024

Lab Sample ID: 280-197290-19

Date Collected: 09/27/24 11:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 21:20	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:26	LMT	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669498	10/02/24 11:44	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/03/24 00:00	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 09:06	IRC	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	669489	10/03/24 09:17	IRC	EET DEN
Total/NA	Analysis	9056A		50	10 mL	10 mL	669489	10/03/24 09:28	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: DUP-01-09272024

Lab Sample ID: 280-197290-20

Date Collected: 09/27/24 00:00

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6010D		1			669422	10/01/24 21:25	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669419	10/02/24 00:28	LMT	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669233	10/01/24 08:13	SMK	EET DEN
Total/NA	Analysis	6020B		1			669498	10/02/24 11:47	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669530	10/02/24 19:27	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/03/24 00:03	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 09:39	IRC	EET DEN
Total/NA	Analysis	9056A		10	10 mL	10 mL	669489	10/03/24 09:50	IRC	EET DEN
Total/NA	Analysis	9056A		50	10 mL	10 mL	669489	10/03/24 10:01	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	10 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: MW-38C-09272024

Lab Sample ID: 280-197290-21

Date Collected: 09/27/24 11:45

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669240	10/02/24 15:02	SMK	EET DEN
Total/NA	Analysis	6010D		1			669773	10/03/24 18:46	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669240	10/02/24 15:02	SMK	EET DEN
Total/NA	Analysis	6020B		1			669658	10/03/24 09:54	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669533	10/02/24 17:14	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/03/24 00:10	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 10:12	IRC	EET DEN
Total/NA	Analysis	9056A		5	10 mL	10 mL	669489	10/03/24 10:23	IRC	EET DEN

Lab Chronicle

Client: AECOM Technical Services Inc
Job ID: 280-197290-2
Project/Site: Basin 2024 Support

Client Sample ID: MW-38C-09272024
Lab Sample ID: 280-197290-21
Date Collected: 09/27/24 11:45
Matrix: Water
Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669287	10/01/24 09:12	BRD	EET DEN

Client Sample ID: EB-09272024
Lab Sample ID: 280-197290-22
Date Collected: 09/27/24 12:00
Matrix: Water
Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3020A			50 mL	50 mL	669240	10/02/24 15:02	SMK	EET DEN
Total/NA	Analysis	6010D		1			669773	10/03/24 18:50	ADL	EET DEN
Total/NA	Prep	3020A			50 mL	50 mL	669240	10/02/24 15:02	SMK	EET DEN
Total/NA	Analysis	6020B		1			669658	10/03/24 09:56	LMT	EET DEN
Total/NA	Prep	7470A			30 mL	50 mL	669533	10/02/24 17:14	CAF	EET DEN
Total/NA	Analysis	7470A		1			669715	10/03/24 00:13	CAF	EET DEN
Total/NA	Analysis	9056A		1	10 mL	10 mL	669489	10/03/24 07:49	IRC	EET DEN
Total/NA	Analysis	SM 2540C		1	100 mL	100 mL	669288	10/01/24 09:14	BRD	EET DEN

Laboratory References:
EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: AECOM Technical Services Inc
Job ID: 280-197290-2
Project/Site: Basin 2024 Support

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Oregon	NELAP	4025	01-08-25

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

Chain of Custody Record

Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:

Company: AECOM Technical Services Inc	PWSID:
Address: 6200 S. Quebec Street	Due Date Requested:
City: Greenwood Village	TAT Requested (days):
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474
Project Name: Basin 2024 Support	Project #: 28020759
Site:	SSOW#:

Analysis Requested

280-197290 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A - Metals	2540C_Calcd - TDS	pH	Total Number of containers
			Preservation Code:				D	D	N	D	N	N	
MW-14B-09252024	9/25/24	1445	G	W			X	X	X	X	X	X	6
MW-20B-09252024		1540					X	X	X	X	X	X	6
MW-37B-09252024		1620					X	X	X	X	X	X	6
MW-49B-09252024		1730					X	X	X	X	X	X	6
MW-53BR-09262024	9/26/24	1245					X	X	X	X	X	X	6
MW-52B-09262024		1320					X	X	X	X	X	X	6
MW-32B-09262024		1430					X	X	X	X	X	X	6
MW-39B-09262024		1515					X	X	X	X	X	X	6
MW-40B-09262024		1550					X	X	X	X	X	X	6
MW-41B-09262024		1640					X	X	X	X	X	X	6
MW-47B-09262024		1720					X	X	X	X	X	X	6

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

Sample Disposal (A fee may be assessed if samples are retaine
☐ Return To Client ☐ Disposal By Lab ☐ Archi

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

Special Instructions/QC Requirements:

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

Relinquished by: Date/Time: Received by: Date/Time:

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

Chain of Custody Record

Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:

Company: AECOM Technical Services Inc	PWSID:
Address: 6200 S. Quebec Street	Due Date Requested:
City: Greenwood Village	TAT Requested (days):
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474
Project Name: Basin 2024 Support	Project #: 28020759
Site:	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A - Metals	2540C_Calcd - TDS	pH	Total Number of containers
			Preservation Code:				D	D	N	D	N	N	
MW-45B-09262024	9/26/24	1800	G	W			X	X	X	X	X	X	6
MW-44B-09262024		1835					X	X	X	X	X	X	6
MW-42B-09262024		0920					X	X	X	X	X	X	6
MW-43B-09262024		1000					X	X	X	X	X	X	6
MW-46B-09272024	9/27/24	0900					X	X	X	X	X	Y	6
MW-36B-09272024		0935					X	X	X	X	X	X	6
MW-21B-09272024		1000				X	X	X	Y	X	X	X	18
MW-38B-09272024		1100					X	X	X	X	X	X	6
Dup-01-09272024		—					X	X	X	X	X	X	6
MW-38C-09272024		1145					X	X	X	X	X	X	6
EB-09272024		1200					X	X	X	X	X	X	6

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

Sample Disposal (A fee may be assessed if samples are retain
☐ Return To Client ☐ Disposal By Lab ☐ Arc

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 1630 9/27/24	Received by:	Date/Time: 09/27

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc

Job Number: 280-197290-2

Login Number: 197290
List Number: 1
Creator: Roehsner, Karen P

List Source: Eurofins Denver

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

eurofins | Environment Testing

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

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Katie Abbott
AECOM Technical Services Inc
6200 S. Quebec Street
Greenwood Village, Colorado 80111

Generated 10/28/2024 3:37:58 PM

JOB DESCRIPTION

Basin 2024 Support

JOB NUMBER

280-197290-1

Eurofins Denver
4955 Yarrow Street
Arvada CO 80002

See page two for job notes and contact information.

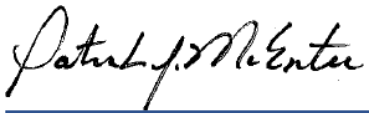
my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



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Authorized for release by
Patrick McEntee, Client Service Manager
Patrick.McEntee@et.eurofinsus.com
(303)736-0107

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Definitions/Glossary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

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

Job Narrative
280-197290-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/27/2024 4:30 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 6 coolers at receipt time were 1.4°C, 1.9°C, 2.7°C, 3.4°C, 3.9°C and 4.3°C.

Receipt Exceptions
Client canceled the request for pH analysis indicating that this is a field method and should not have been included on the COC. 280-197290-1, 280-197290-2, 280-197290-3, 280-197290-4, 280-197290-5, 280-197290-6, 280-197290-7, 280-197290-8, 280-197290-9, 280-197290-10, 280-197290-11, 280-197290-12, 280-197290-13, 280-197290-14, 280-197290-15, 280-197290-16, 280-197290-17, 280-197290-18, 280-197290-18[MS], 280-197290-18[MSD], 280-197290-19, 280-197290-20, 280-197290-21 and 280-197290-22

Method 9315 - Radium-226 (GFPC)
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Radium-226 (GFPC). The samples were prepared on 10/2/2024 and analyzed on 10/24/2024.

Method 9320 - Radium-228 (GFPC)
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024 (280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-21B-09272024 (280-197290-18MS), MW-21B-09272024 (280-197290-18MSD), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Radium-228 (GFPC). The samples were prepared on 10/2/2024 and analyzed on 10/14/2024 and 10/21/2024.

Radium-228 batch 681953
The LCS recovered at (128%). The limits in our LIMS system at 75-125 reflect the requirements of a regulatory agency that represents a large amount of our work. However the samples associated with this LCS are not from this agency and are therefore held to our in-house statistical limits of (69-145) per method requirements. The LCS passes, no further action is required. LCS 160-681953/2-A

Method Ra226_Ra228 - Combined Radium-226 and Radium-228
Samples MW-14B-09252024 (280-197290-1), MW-20B-09252024 (280-197290-2), MW-37B-09252024 (280-197290-3), MW-49B-09252024 (280-197290-4), MW-53BR-09262024 (280-197290-5), MW-52B-09262024 (280-197290-6), MW-32B-09262024 (280-197290-7), MW-39B-09262024 (280-197290-8), MW-40B-09262024 (280-197290-9), MW-41B-09262024 (280-197290-10), MW-47B-09262024 (280-197290-11), MW-45B-09262024 (280-197290-12), MW-44B-09262024

Job ID: 280-197290-1 (Continued)

(280-197290-13), MW-42B-09262024 (280-197290-14), MW-43B-09262024 (280-197290-15), MW-46B-09272024 (280-197290-16), MW-36B-09272024 (280-197290-17), MW-21B-09272024 (280-197290-18), MW-38B-09272024 (280-197290-19), DUP-01-09272024 (280-197290-20), MW-38C-09272024 (280-197290-21) and EB-09272024 (280-197290-22) were analyzed for Combined Radium-226 and Radium-228. The samples were analyzed on 10/25/2024 and 10/28/2024.

Detection Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Client Sample ID: MW-14B-09252024 — **Lab Sample ID: 280-197290-1**

No Detections.

Client Sample ID: MW-20B-09252024 — **Lab Sample ID: 280-197290-2**

No Detections.

Client Sample ID: MW-37B-09252024 — **Lab Sample ID: 280-197290-3**

No Detections.

Client Sample ID: MW-49B-09252024 — **Lab Sample ID: 280-197290-4**

No Detections.

Client Sample ID: MW-53BR-09262024 — **Lab Sample ID: 280-197290-5**

No Detections.

Client Sample ID: MW-52B-09262024 — **Lab Sample ID: 280-197290-6**

No Detections.

Client Sample ID: MW-32B-09262024 — **Lab Sample ID: 280-197290-7**

No Detections.

Client Sample ID: MW-39B-09262024 — **Lab Sample ID: 280-197290-8**

No Detections.

Client Sample ID: MW-40B-09262024 — **Lab Sample ID: 280-197290-9**

No Detections.

Client Sample ID: MW-41B-09262024 — **Lab Sample ID: 280-197290-10**

No Detections.

Client Sample ID: MW-47B-09262024 — **Lab Sample ID: 280-197290-11**

No Detections.

Client Sample ID: MW-45B-09262024 — **Lab Sample ID: 280-197290-12**

No Detections.

Client Sample ID: MW-44B-09262024 — **Lab Sample ID: 280-197290-13**

No Detections.

Client Sample ID: MW-42B-09262024 — **Lab Sample ID: 280-197290-14**

No Detections.

Client Sample ID: MW-43B-09262024 — **Lab Sample ID: 280-197290-15**

No Detections.

Client Sample ID: MW-46B-09272024 — **Lab Sample ID: 280-197290-16**

No Detections.

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: AECOM Technical Services Inc
Job ID: 280-197290-1
Project/Site: Basin 2024 Support

Client Sample ID: MW-36B-09272024 — Lab Sample ID: 280-197290-17

No Detections.

Client Sample ID: MW-21B-09272024 — Lab Sample ID: 280-197290-18

No Detections.

Client Sample ID: MW-38B-09272024 — Lab Sample ID: 280-197290-19

No Detections.

Client Sample ID: DUP-01-09272024 — Lab Sample ID: 280-197290-20

No Detections.

Client Sample ID: MW-38C-09272024 — Lab Sample ID: 280-197290-21

No Detections.

Client Sample ID: EB-09272024 — Lab Sample ID: 280-197290-22

No Detections.

This Detection Summary does not include radiochemical test results.

Method Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

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

Sample Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-197290-1	MW-14B-09252024	Water	09/25/24 14:45	09/27/24 16:30
280-197290-2	MW-20B-09252024	Water	09/25/24 15:40	09/27/24 16:30
280-197290-3	MW-37B-09252024	Water	09/25/24 16:20	09/27/24 16:30
280-197290-4	MW-49B-09252024	Water	09/25/24 17:30	09/27/24 16:30
280-197290-5	MW-53BR-09262024	Water	09/26/24 12:45	09/27/24 16:30
280-197290-6	MW-52B-09262024	Water	09/26/24 13:20	09/27/24 16:30
280-197290-7	MW-32B-09262024	Water	09/26/24 14:30	09/27/24 16:30
280-197290-8	MW-39B-09262024	Water	09/26/24 15:15	09/27/24 16:30
280-197290-9	MW-40B-09262024	Water	09/26/24 15:50	09/27/24 16:30
280-197290-10	MW-41B-09262024	Water	09/26/24 16:40	09/27/24 16:30
280-197290-11	MW-47B-09262024	Water	09/26/24 17:20	09/27/24 16:30
280-197290-12	MW-45B-09262024	Water	09/26/24 18:00	09/27/24 16:30
280-197290-13	MW-44B-09262024	Water	09/26/24 18:35	09/27/24 16:30
280-197290-14	MW-42B-09262024	Water	09/26/24 09:20	09/27/24 16:30
280-197290-15	MW-43B-09262024	Water	09/26/24 10:00	09/27/24 16:30
280-197290-16	MW-46B-09272024	Water	09/27/24 09:00	09/27/24 16:30
280-197290-17	MW-36B-09272024	Water	09/27/24 09:35	09/27/24 16:30
280-197290-18	MW-21B-09272024	Water	09/27/24 10:00	09/27/24 16:30
280-197290-19	MW-38B-09272024	Water	09/27/24 11:00	09/27/24 16:30
280-197290-20	DUP-01-09272024	Water	09/27/24 00:00	09/27/24 16:30
280-197290-21	MW-38C-09272024	Water	09/27/24 11:45	09/27/24 16:30
280-197290-22	EB-09272024	Water	09/27/24 12:00	09/27/24 16:30

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0359	U	0.0846	0.0846	1.00	0.156	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.1*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0389	U	0.0685	0.0686	1.00	0.122	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0442	U	0.0960	0.0961	1.00	0.174	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.6*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.189**		0.114	0.115	1.00	0.146	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.2*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.569**		0.209	0.215	1.00	0.185	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.1*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	1.23		0.288	0.309	1.00	0.195	pCi/L	10/02/24 10:40	10/24/24 12:05	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.3*		*30 - 110*	*10/02/24 10:40*	*10/24/24 12:05*	*1*

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.286		0.140	0.142	1.00	0.171	pCi/L	10/02/24 10:40	10/24/24 12:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*30 - 110*	*10/02/24 10:40*	*10/24/24 12:08*	*1*

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0194	U	0.0672	0.0672	1.00	0.131	pCi/L	10/02/24 10:40	10/24/24 14:28	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.2*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:28*	*1*

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0494	U	0.0718	0.0719	1.00	0.123	pCi/L	10/02/24 10:40	10/24/24 14:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:30*	*1*

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0288	U	0.0831	0.0831	1.00	0.156	pCi/L	10/02/24 10:40	10/24/24 14:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.6*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:30*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.117	U	0.101	0.102	1.00	0.150	pCi/L	10/02/24 10:40	10/24/24 14:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:30*	*1*

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00127	U	0.0651	0.0651	1.00	0.144	pCi/L	10/02/24 10:40	10/24/24 14:30	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*78.1*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:30*	*1*

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.00459	U	0.0899	0.0899	1.00	0.180	pCi/L	10/02/24 10:40	10/24/24 14:39	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.2*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:39*	*1*

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0708	U	0.104	0.104	1.00	0.177	pCi/L	10/02/24 10:40	10/24/24 14:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.7*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:41*	*1*

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.105	U	0.0986	0.0991	1.00	0.152	pCi/L	10/02/24 10:40	10/24/24 14:41	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*10/02/24 10:40*	*10/24/24 14:41*	*1*

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.276		0.141	0.143	1.00	0.166	pCi/L	10/02/24 10:40	10/24/24 14:41	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	79.6		30 - 110	10/02/24 10:40	10/24/24 14:41	1

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.114	U	0.0956	0.0962	1.00	0.139	pCi/L	10/02/24 10:40	10/24/24 14:41	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110	10/02/24 10:40	10/24/24 14:41	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0207	U	0.0820	0.0820	1.00	0.158	pCi/L	10/02/24 10:40	10/24/24 14:42	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	93.3		30 - 110	10/02/24 10:40	10/24/24 14:42	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.320		0.148	0.151	1.00	0.173	pCi/L	10/02/24 10:40	10/24/24 14:42	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.1		30 - 110	10/02/24 10:40	10/24/24 14:42	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.216		0.117	0.118	1.00	0.145	pCi/L	10/02/24 10:40	10/24/24 14:42	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		30 - 110	10/02/24 10:40	10/24/24 14:42	1

Method: SW846 9315 - Radium-226 (GFPC)

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.123		0.0749	0.0757	1.00	0.0970	pCi/L	10/02/24 10:33	10/24/24 07:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*30 - 110*	*10/02/24 10:33*	*10/24/24 07:46*	*1*

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.0303	U	0.0564	0.0565	1.00	0.101	pCi/L	10/02/24 10:33	10/24/24 07:46	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.4*		*30 - 110*	*10/02/24 10:33*	*10/24/24 07:46*	*1*

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.152	U	0.302	0.302	1.00	0.526	pCi/L	10/02/24 10:42	10/21/24 12:13	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.1*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:13*	*1*
Y Carrier	*80.7*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:13*	*1*

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.281	U	0.328	0.329	1.00	0.539	pCi/L	10/02/24 10:42	10/21/24 12:13	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*98.5*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:13*	*1*
Y Carrier	*82.6*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:13*	*1*

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	1.08		0.503	0.512	1.00	0.698	pCi/L	10/02/24 10:42	10/21/24 12:14	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.6		30 - 110	10/02/24 10:42	10/21/24 12:14	1
Y Carrier	78.9		30 - 110	10/02/24 10:42	10/21/24 12:14	1

Client Sample ID: MW-49B-09252024 — **Lab Sample ID: 280-197290-4**
Date Collected: 09/25/24 17:30 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.117	U	0.295	0.295	1.00	0.521	pCi/L	10/02/24 10:42	10/21/24 12:14	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	97.2		30 - 110	10/02/24 10:42	10/21/24 12:14	1
Y Carrier	82.6		30 - 110	10/02/24 10:42	10/21/24 12:14	1

Client Sample ID: MW-53BR-09262024 — **Lab Sample ID: 280-197290-5**
Date Collected: 09/26/24 12:45 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.360	U	0.489	0.490	1.00	0.818	pCi/L	10/02/24 10:42	10/21/24 12:14	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.1		30 - 110	10/02/24 10:42	10/21/24 12:14	1
Y Carrier	78.9		30 - 110	10/02/24 10:42	10/21/24 12:14	1

Client Sample ID: MW-52B-09262024 — **Lab Sample ID: 280-197290-6**
Date Collected: 09/26/24 13:20 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**2.16**		0.681	0.709	1.00	0.809	pCi/L	10/02/24 10:42	10/21/24 12:14	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	86.3		30 - 110	10/02/24 10:42	10/21/24 12:14	1
Y Carrier	82.6		30 - 110	10/02/24 10:42	10/21/24 12:14	1

Client Sample ID: MW-32B-09262024 — **Lab Sample ID: 280-197290-7**
Date Collected: 09/26/24 14:30 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.970**		0.442	0.451	1.00	0.610	pCi/L	10/02/24 10:42	10/21/24 12:15	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.6		30 - 110	10/02/24 10:42	10/21/24 12:15	1
Y Carrier	81.1		30 - 110	10/02/24 10:42	10/21/24 12:15	1

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.185	U	0.335	0.335	1.00	0.575	pCi/L	10/02/24 10:42	10/21/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*97.2*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*
Y Carrier	*82.2*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.15**		0.414	0.427	1.00	0.504	pCi/L	10/02/24 10:42	10/21/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*95.6*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*
Y Carrier	*83.4*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.311	U	0.354	0.355	1.00	0.580	pCi/L	10/02/24 10:42	10/21/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.6*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*
Y Carrier	*79.6*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.133	U	0.302	0.302	1.00	0.530	pCi/L	10/02/24 10:42	10/21/24 12:15	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.0*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*
Y Carrier	*83.0*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:15*	*1*

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.779**		0.454	0.460	1.00	0.658	pCi/L	10/02/24 10:42	10/21/24 12:17	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	78.1		30 - 110	10/02/24 10:42	10/21/24 12:17	1
Y Carrier	83.0		30 - 110	10/02/24 10:42	10/21/24 12:17	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.0912	U	0.344	0.344	1.00	0.621	pCi/L	10/02/24 10:42	10/21/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	89.2		30 - 110	10/02/24 10:42	10/21/24 12:17	1
Y Carrier	73.6		30 - 110	10/02/24 10:42	10/21/24 12:17	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.458	U	0.369	0.371	1.00	0.571	pCi/L	10/02/24 10:42	10/21/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	89.7		30 - 110	10/02/24 10:42	10/21/24 12:17	1
Y Carrier	80.0		30 - 110	10/02/24 10:42	10/21/24 12:17	1

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.541**		0.355	0.359	1.00	0.530	pCi/L	10/02/24 10:42	10/21/24 12:17	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	101		30 - 110	10/02/24 10:42	10/21/24 12:17	1
Y Carrier	78.9		30 - 110	10/02/24 10:42	10/21/24 12:17	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.200	U	0.369	0.370	1.00	0.637	pCi/L	10/02/24 10:42	10/21/24 12:18	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	79.6		30 - 110	10/02/24 10:42	10/21/24 12:18	1
Y Carrier	86.4		30 - 110	10/02/24 10:42	10/21/24 12:18	1

Method: SW846 9320 - Radium-228 (GFPC)

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.427	U	0.345	0.347	1.00	0.533	pCi/L	10/02/24 10:42	10/21/24 12:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*90.5*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:18*	*1*
Y Carrier	*82.6*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:18*	*1*

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.0640	U	0.277	0.277	1.00	0.541	pCi/L	10/02/24 10:42	10/21/24 12:18	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*93.3*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:18*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:18*	*1*

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.293	U	0.352	0.353	1.00	0.581	pCi/L	10/02/24 10:42	10/21/24 12:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.1*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:19*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:19*	*1*

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**0.569**		0.365	0.368	1.00	0.543	pCi/L	10/02/24 10:42	10/21/24 12:19	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*101*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:19*	*1*
Y Carrier	*81.9*		*30 - 110*	*10/02/24 10:42*	*10/21/24 12:19*	*1*

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.380	U	0.424	0.426	1.00	0.693	pCi/L	10/02/24 11:19	10/14/24 12:41	1

Method: SW846 9320 - Radium-228 (GFPC) (Continued)

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	90.5		30 - 110	10/02/24 11:19	10/14/24 12:41	1
Y Carrier	68.8		30 - 110	10/02/24 11:19	10/14/24 12:41	1

Client Sample ID: EB-09272024 — **Lab Sample ID: 280-197290-22**
Date Collected: 09/27/24 12:00 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	-0.311	U	0.283	0.284	1.00	0.639	pCi/L	10/02/24 11:19	10/14/24 14:04	1

Carrier	%Yield	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	95.4		30 - 110	10/02/24 11:19	10/14/24 14:04	1
Y Carrier	81.9		30 - 110	10/02/24 11:19	10/14/24 14:04	1

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

Client Sample ID: MW-14B-09252024 — **Lab Sample ID: 280-197290-1**
Date Collected: 09/25/24 14:45 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.188	U	0.314	0.314	5.00	0.526	pCi/L		10/25/24 13:03	1

Client Sample ID: MW-20B-09252024 — **Lab Sample ID: 280-197290-2**
Date Collected: 09/25/24 15:40 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.319	U	0.335	0.336	5.00	0.539	pCi/L		10/25/24 13:03	1

Client Sample ID: MW-37B-09252024 — **Lab Sample ID: 280-197290-3**
Date Collected: 09/25/24 16:20 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**1.13**		0.512	0.521	5.00	0.698	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-49B-09252024 — **Lab Sample ID: 280-197290-4**
Date Collected: 09/25/24 17:30 — **Matrix: Water**
Date Received: 09/27/24 16:30

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.306	U	0.316	0.317	5.00	0.521	pCi/L		10/28/24 15:03	1

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

Client Sample ID: MW-53BR-09262024
Date Collected: 09/26/24 12:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-5
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.930		0.532	0.535	5.00	0.818	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-52B-09262024
Date Collected: 09/26/24 13:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-6
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	3.39		0.739	0.773	5.00	0.809	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-32B-09262024
Date Collected: 09/26/24 14:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-7
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.26		0.464	0.473	5.00	0.610	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-39B-09262024
Date Collected: 09/26/24 15:15
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-8
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.204	U	0.342	0.342	5.00	0.575	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-40B-09262024
Date Collected: 09/26/24 15:50
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-9
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	1.20		0.420	0.433	5.00	0.504	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-41B-09262024
Date Collected: 09/26/24 16:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-10
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.340	U	0.364	0.365	5.00	0.580	pCi/L		10/28/24 15:03	1

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

Client Sample ID: MW-47B-09262024
Date Collected: 09/26/24 17:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-11
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.250	U	0.318	0.319	5.00	0.530	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-45B-09262024
Date Collected: 09/26/24 18:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-12
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.781**		0.459	0.465	5.00	0.658	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-44B-09262024
Date Collected: 09/26/24 18:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-13
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.0958	U	0.356	0.356	5.00	0.621	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-42B-09262024
Date Collected: 09/26/24 09:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-14
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.529	U	0.383	0.385	5.00	0.571	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-43B-09262024
Date Collected: 09/26/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-15
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	**0.647**		0.368	0.372	5.00	0.530	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-46B-09272024
Date Collected: 09/27/24 09:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-16
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.477	U	0.395	0.397	5.00	0.637	pCi/L		10/28/24 15:03	1

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

Client Sample ID: MW-36B-09272024
Date Collected: 09/27/24 09:35
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-17
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.540		0.358	0.360	5.00	0.533	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-21B-09272024
Date Collected: 09/27/24 10:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-18
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.0433	U	0.289	0.289	5.00	0.541	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-38B-09272024
Date Collected: 09/27/24 11:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-19
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.613		0.382	0.384	5.00	0.581	pCi/L		10/28/24 15:03	1

Client Sample ID: DUP-01-09272024
Date Collected: 09/27/24 00:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-20
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.785		0.383	0.386	5.00	0.543	pCi/L		10/28/24 15:03	1

Client Sample ID: MW-38C-09272024
Date Collected: 09/27/24 11:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-21
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	0.504	U	0.431	0.433	5.00	0.693	pCi/L		10/28/24 15:03	1

Client Sample ID: EB-09272024
Date Collected: 09/27/24 12:00
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-22
Matrix: Water

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Combined Radium 226 + 228	-0.281	U	0.289	0.290	5.00	0.639	pCi/L		10/28/24 15:03	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-681942/1-A
Matrix: Water
Analysis Batch: 684899

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 681942

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.08642	U	0.0713	0.0717	1.00	0.105	pCi/L	10/02/24 10:33	10/24/24 07:46	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*92.5*		*30 - 110*	*10/02/24 10:33*	*10/24/24 07:46*	*1*

Lab Sample ID: LCS 160-681942/2-A
Matrix: Water
Analysis Batch: 684899

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681942

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			9.58	9.720		1.03	1.00	0.137	pCi/L	101	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*94.3*		*30 - 110*

Lab Sample ID: 280-197290-21 DU
Matrix: Water
Analysis Batch: 684899

Client Sample ID: MW-38C-09272024
Prep Type: Total/NA
Prep Batch: 681942

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.123			0.04496	U	0.0681	1.00	0.117	pCi/L			0.54	1

Carrier	*DU %Yield*	*DU Qualifier*	*Limits*
Ba Carrier	*92.8*		*30 - 110*

Lab Sample ID: MB 160-681944/1-A
Matrix: Water
Analysis Batch: 684895

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 681944

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.008298	U	0.0751	0.0751	1.00	0.151	pCi/L	10/02/24 10:40	10/24/24 09:34	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*100*		*30 - 110*	*10/02/24 10:40*	*10/24/24 09:34*	*1*

Lab Sample ID: LCS 160-681944/2-A
Matrix: Water
Analysis Batch: 684895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681944

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			9.58	10.50		1.18	1.00	0.162	pCi/L	110	75 - 125		

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

Lab Sample ID: LCS 160-681944/2-A
Matrix: Water
Analysis Batch: 684895

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681944

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	86.1		30 - 110

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 684899

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 681944

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226	0.0207	U	9.56	8.749		1.01	1.00	0.198	pCi/L	91	60 - 140		

Carrier	MS %Yield	MS Qualifier	Limits
Ba Carrier	99.7		30 - 110

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 684899

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 681944

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	0.0207	U	9.60	9.646		1.08	1.00	0.144	pCi/L	100	60 - 140	0.43	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Ba Carrier	93.8		30 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-681945/1-A
Matrix: Water
Analysis Batch: 684457

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 681945

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.9058		0.389	0.398	1.00	0.516	pCi/L	10/02/24 10:42	10/21/24 12:13	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	100		30 - 110	10/02/24 10:42	10/21/24 12:13	1
Y Carrier	81.9		30 - 110	10/02/24 10:42	10/21/24 12:13	1

Lab Sample ID: LCS 160-681945/2-A
Matrix: Water
Analysis Batch: 684457

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681945

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.41	9.886		1.38	1.00	0.568	pCi/L	118	75 - 125		

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

Lab Sample ID: LCS 160-681945/2-A
Matrix: Water
Analysis Batch: 684457

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681945

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	86.1		30 - 110
Y Carrier	81.1		30 - 110

Lab Sample ID: 280-197290-18 MS
Matrix: Water
Analysis Batch: 684310

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 681945

Analyte	Sample Result	Sample Qual	Spike Added	MS Result	MS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228	-0.0640	U	8.40	8.621		1.18	1.00	0.485	pCi/L	103	60 - 140		

Carrier	MS %Yield	MS Qualifier	Limits
Ba Carrier	99.7		30 - 110
Y Carrier	85.2		30 - 110

Lab Sample ID: 280-197290-18 MSD
Matrix: Water
Analysis Batch: 684310

Client Sample ID: MW-21B-09272024
Prep Type: Total/NA
Prep Batch: 681945

Analyte	Sample Result	Sample Qual	Spike Added	MSD Result	MSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228	-0.0640	U	8.43	9.453		1.28	1.00	0.491	pCi/L	112	60 - 140	0.34	1

Carrier	MSD %Yield	MSD Qualifier	Limits
Ba Carrier	93.8		30 - 110
Y Carrier	85.2		30 - 110

Lab Sample ID: MB 160-681953/1-A
Matrix: Water
Analysis Batch: 683384

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 681953

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.5402	U	0.426	0.429	1.00	0.658	pCi/L	10/02/24 11:19	10/14/24 12:41	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	92.5		30 - 110	10/02/24 11:19	10/14/24 12:41	1
Y Carrier	74.0		30 - 110	10/02/24 11:19	10/14/24 12:41	1

Lab Sample ID: LCS 160-681953/2-A
Matrix: Water
Analysis Batch: 683384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681953

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.43	10.75		1.48	1.00	0.616	pCi/L	128	75 - 125		

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

Lab Sample ID: LCS 160-681953/2-A
Matrix: Water
Analysis Batch: 683384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 681953

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	94.3		30 - 110
Y Carrier	74.4		30 - 110

Lab Sample ID: 280-197290-21 DU
Matrix: Water
Analysis Batch: 683384

Client Sample ID: MW-38C-09272024
Prep Type: Total/NA
Prep Batch: 681953

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-228	0.380	U		0.3837	U	0.408	1.00	0.660	pCi/L			0	1

Carrier	DU %Yield	DU Qualifier	Limits
Ba Carrier	92.8		30 - 110
Y Carrier	72.1		30 - 110

Rad

Prep Batch: 681942

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	PrecSep-21	
280-197290-22	EB-09272024	Total/NA	Water	PrecSep-21	
MB 160-681942/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-681942/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
280-197290-21 DU	MW-38C-09272024	Total/NA	Water	PrecSep-21	

Prep Batch: 681944

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	PrecSep-21	
280-197290-2	MW-20B-09252024	Total/NA	Water	PrecSep-21	
280-197290-3	MW-37B-09252024	Total/NA	Water	PrecSep-21	
280-197290-4	MW-49B-09252024	Total/NA	Water	PrecSep-21	
280-197290-5	MW-53BR-09262024	Total/NA	Water	PrecSep-21	
280-197290-6	MW-52B-09262024	Total/NA	Water	PrecSep-21	
280-197290-7	MW-32B-09262024	Total/NA	Water	PrecSep-21	
280-197290-8	MW-39B-09262024	Total/NA	Water	PrecSep-21	
280-197290-9	MW-40B-09262024	Total/NA	Water	PrecSep-21	
280-197290-10	MW-41B-09262024	Total/NA	Water	PrecSep-21	
280-197290-11	MW-47B-09262024	Total/NA	Water	PrecSep-21	
280-197290-12	MW-45B-09262024	Total/NA	Water	PrecSep-21	
280-197290-13	MW-44B-09262024	Total/NA	Water	PrecSep-21	
280-197290-14	MW-42B-09262024	Total/NA	Water	PrecSep-21	
280-197290-15	MW-43B-09262024	Total/NA	Water	PrecSep-21	
280-197290-16	MW-46B-09272024	Total/NA	Water	PrecSep-21	
280-197290-17	MW-36B-09272024	Total/NA	Water	PrecSep-21	
280-197290-18	MW-21B-09272024	Total/NA	Water	PrecSep-21	
280-197290-19	MW-38B-09272024	Total/NA	Water	PrecSep-21	
280-197290-20	DUP-01-09272024	Total/NA	Water	PrecSep-21	
MB 160-681944/1-A	Method Blank	Total/NA	Water	PrecSep-21	
LCS 160-681944/2-A	Lab Control Sample	Total/NA	Water	PrecSep-21	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	PrecSep-21	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	PrecSep-21	

Prep Batch: 681945

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-1	MW-14B-09252024	Total/NA	Water	PrecSep_0	
280-197290-2	MW-20B-09252024	Total/NA	Water	PrecSep_0	
280-197290-3	MW-37B-09252024	Total/NA	Water	PrecSep_0	
280-197290-4	MW-49B-09252024	Total/NA	Water	PrecSep_0	
280-197290-5	MW-53BR-09262024	Total/NA	Water	PrecSep_0	
280-197290-6	MW-52B-09262024	Total/NA	Water	PrecSep_0	
280-197290-7	MW-32B-09262024	Total/NA	Water	PrecSep_0	
280-197290-8	MW-39B-09262024	Total/NA	Water	PrecSep_0	
280-197290-9	MW-40B-09262024	Total/NA	Water	PrecSep_0	
280-197290-10	MW-41B-09262024	Total/NA	Water	PrecSep_0	
280-197290-11	MW-47B-09262024	Total/NA	Water	PrecSep_0	
280-197290-12	MW-45B-09262024	Total/NA	Water	PrecSep_0	
280-197290-13	MW-44B-09262024	Total/NA	Water	PrecSep_0	
280-197290-14	MW-42B-09262024	Total/NA	Water	PrecSep_0	
280-197290-15	MW-43B-09262024	Total/NA	Water	PrecSep_0	
280-197290-16	MW-46B-09272024	Total/NA	Water	PrecSep_0	

Rad (Continued)

Prep Batch: 681945 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-17	MW-36B-09272024	Total/NA	Water	PrecSep_0	
280-197290-18	MW-21B-09272024	Total/NA	Water	PrecSep_0	
280-197290-19	MW-38B-09272024	Total/NA	Water	PrecSep_0	
280-197290-20	DUP-01-09272024	Total/NA	Water	PrecSep_0	
MB 160-681945/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-681945/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
280-197290-18 MS	MW-21B-09272024	Total/NA	Water	PrecSep_0	
280-197290-18 MSD	MW-21B-09272024	Total/NA	Water	PrecSep_0	

Prep Batch: 681953

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-197290-21	MW-38C-09272024	Total/NA	Water	PrecSep_0	
280-197290-22	EB-09272024	Total/NA	Water	PrecSep_0	
MB 160-681953/1-A	Method Blank	Total/NA	Water	PrecSep_0	
LCS 160-681953/2-A	Lab Control Sample	Total/NA	Water	PrecSep_0	
280-197290-21 DU	MW-38C-09272024	Total/NA	Water	PrecSep_0	

Lab Chronicle

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Client Sample ID: MW-14B-09252024
Date Collected: 09/25/24 14:45
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			998.99 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 09:34	FLC	EET SL
Total/NA	Prep	PrecSep_0			998.99 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:13	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/25/24 13:03	FLC	EET SL

Client Sample ID: MW-20B-09252024
Date Collected: 09/25/24 15:40
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1002.71 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 09:34	FLC	EET SL
Total/NA	Prep	PrecSep_0			1002.71 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:13	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/25/24 13:03	FLC	EET SL

Client Sample ID: MW-37B-09252024
Date Collected: 09/25/24 16:20
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1003.54 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 09:34	FLC	EET SL
Total/NA	Prep	PrecSep_0			1003.54 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:14	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-49B-09252024
Date Collected: 09/25/24 17:30
Date Received: 09/27/24 16:30

Lab Sample ID: 280-197290-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1005.26 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 09:34	FLC	EET SL
Total/NA	Prep	PrecSep_0			1005.26 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:14	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Client Sample ID: MW-53BR-09262024

Lab Sample ID: 280-197290-5

Date Collected: 09/26/24 12:45

Matrix: Water

Date Received: 09/27/24 16:30

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			751.14 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 09:34	FLC	EET SL
Total/NA	Prep	PrecSep_0			751.14 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:14	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-52B-09262024

Lab Sample ID: 280-197290-6

Date Collected: 09/26/24 13:20

Matrix: Water

Date Received: 09/27/24 16:30

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			752.29 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 12:05	FLC	EET SL
Total/NA	Prep	PrecSep_0			752.29 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:14	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-32B-09262024

Lab Sample ID: 280-197290-7

Date Collected: 09/26/24 14:30

Matrix: Water

Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.40 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 12:08	SWS	EET SL
Total/NA	Prep	PrecSep_0			1000.40 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:15	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-39B-09262024

Lab Sample ID: 280-197290-8

Date Collected: 09/26/24 15:15

Matrix: Water

Date Received: 09/27/24 16:30

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			1004.01 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 14:28	FLC	EET SL
Total/NA	Prep	PrecSep_0			1004.01 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:15	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-40B-09262024

Lab Sample ID: 280-197290-9

Date Collected: 09/26/24 15:50

Matrix: Water

Date Received: 09/27/24 16:30

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			996.07 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 14:30	FLC	EET SL
Total/NA	Prep	PrecSep_0			996.07 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:15	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-41B-09262024

Lab Sample ID: 280-197290-10

Date Collected: 09/26/24 16:40

Matrix: Water

Date Received: 09/27/24 16:30

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			999.67 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 14:30	FLC	EET SL
Total/NA	Prep	PrecSep_0			999.67 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:15	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-47B-09262024

Lab Sample ID: 280-197290-11

Date Collected: 09/26/24 17:20

Matrix: Water

Date Received: 09/27/24 16:30

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			998.86 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 14:30	FLC	EET SL
Total/NA	Prep	PrecSep_0			998.86 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:15	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-45B-09262024

Lab Sample ID: 280-197290-12

Date Collected: 09/26/24 18:00

Matrix: Water

Date Received: 09/27/24 16:30

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			1002.72 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684895	10/24/24 14:30	FLC	EET SL
Total/NA	Prep	PrecSep_0			1002.72 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:17	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-44B-09262024

Lab Sample ID: 280-197290-13

Date Collected: 09/26/24 18:35

Matrix: Water

Date Received: 09/27/24 16:30

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			1001.28 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:39	SWS	EET SL
Total/NA	Prep	PrecSep_0			1001.28 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:17	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-42B-09262024

Lab Sample ID: 280-197290-14

Date Collected: 09/26/24 09:20

Matrix: Water

Date Received: 09/27/24 16:30

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			1004.35 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:41	SWS	EET SL
Total/NA	Prep	PrecSep_0			1004.35 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:17	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-43B-09262024

Lab Sample ID: 280-197290-15

Date Collected: 09/26/24 10:00

Matrix: Water

Date Received: 09/27/24 16:30

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			1002.77 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:41	SWS	EET SL
Total/NA	Prep	PrecSep_0			1002.77 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:17	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-46B-09272024

Lab Sample ID: 280-197290-16

Date Collected: 09/27/24 09:00

Matrix: Water

Date Received: 09/27/24 16:30

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			1002.98 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:41	SWS	EET SL
Total/NA	Prep	PrecSep_0			1002.98 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:18	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Client Sample ID: MW-36B-09272024
Lab Sample ID: 280-197290-17
Date Collected: 09/27/24 09:35
Matrix: Water
Date Received: 09/27/24 16:30

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			1003.42 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:41	SWS	EET SL
Total/NA	Prep	PrecSep_0			1003.42 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:18	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-21B-09272024
Lab Sample ID: 280-197290-18
Date Collected: 09/27/24 10:00
Matrix: Water
Date Received: 09/27/24 16:30

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			1001.98 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:42	SWS	EET SL
Total/NA	Prep	PrecSep_0			1001.98 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684457	10/21/24 12:18	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: MW-38B-09272024
Lab Sample ID: 280-197290-19
Date Collected: 09/27/24 11:00
Matrix: Water
Date Received: 09/27/24 16:30

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			996.89 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:42	SWS	EET SL
Total/NA	Prep	PrecSep_0			996.89 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684310	10/21/24 12:19	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: DUP-01-09272024
Lab Sample ID: 280-197290-20
Date Collected: 09/27/24 00:00
Matrix: Water
Date Received: 09/27/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	PrecSep-21			1000.63 mL	1.0 g	681944	10/02/24 10:40	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 14:42	SWS	EET SL
Total/NA	Prep	PrecSep_0			1000.63 mL	1.0 g	681945	10/02/24 10:42	MLT	EET SL
Total/NA	Analysis	9320		1			684310	10/21/24 12:19	FLC	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Lab Chronicle

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Client Sample ID: MW-38C-09272024

Lab Sample ID: 280-197290-21

Date Collected: 09/27/24 11:45

Matrix: Water

Date Received: 09/27/24 16:30

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			1005.78 mL	1.0 g	681942	10/02/24 10:33	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 07:46	SWS	EET SL
Total/NA	Prep	PrecSep_0			1005.78 mL	1.0 g	681953	10/02/24 11:19	MLT	EET SL
Total/NA	Analysis	9320		1			683384	10/14/24 12:41	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Client Sample ID: EB-09272024

Lab Sample ID: 280-197290-22

Date Collected: 09/27/24 12:00

Matrix: Water

Date Received: 09/27/24 16:30

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			997.85 mL	1.0 g	681942	10/02/24 10:33	MLT	EET SL
Total/NA	Analysis	9315		1			684899	10/24/24 07:46	SWS	EET SL
Total/NA	Prep	PrecSep_0			997.85 mL	1.0 g	681953	10/02/24 11:19	MLT	EET SL
Total/NA	Analysis	9320		1			683384	10/14/24 14:04	SCB	EET SL
Total/NA	Analysis	Ra226_Ra228		1			685162	10/28/24 15:03	FLC	EET SL

Laboratory References:

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

Accreditation/Certification Summary

Client: AECOM Technical Services Inc
Job ID: 280-197290-1
Project/Site: Basin 2024 Support

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	04-08-25
ANAB	ISO/IEC 17025	L2305	04-06-25
Arizona	State	AZ0813	12-08-24
California	Los Angeles County Sanitation Districts	10259	06-30-22 *
California	State	2886	06-30-25
Connecticut	State	PH-0241	03-31-25
Florida	NELAP	E87689	06-30-25
HI - RadChem Recognition	State	n/a	06-30-25
Illinois	NELAP	200023	11-30-25
Iowa	State	373	12-01-24
Kansas	NELAP	E-10236	10-31-24
Kentucky (DW)	State	KY90125	12-31-24
Kentucky (WW)	State	KY90125 (Permit KY0004049)	12-31-24
Louisiana	NELAP	04080	06-30-22 *
Louisiana (All)	NELAP	04080	06-30-25
Louisiana (DW)	State	LA011	12-31-24
Maryland	State	310	09-30-25
Massachusetts	State	M-MO054	06-30-25
Missouri	State	780	06-30-25
Nevada	State	MO00054	07-31-25
New Jersey	NELAP	MO002	06-30-25
New Mexico	State	MO00054	06-30-25
New York	NELAP	11616	03-31-25
North Carolina (DW)	State	29700	07-31-25
North Dakota	State	R-207	12-31-24
Oregon	NELAP	4157	09-01-25
Pennsylvania	NELAP	68-00540	02-28-25
South Carolina	State	85002001	06-30-25
Texas	NELAP	T104704193	07-31-25
US Fish & Wildlife	US Federal Programs	058448	07-31-25
USDA	US Federal Programs	P330-17-00028	05-18-26
Utah	NELAP	MO00054	07-31-25
Virginia	NELAP	460230	06-14-25
Washington	State	C592	08-30-25
West Virginia DEP	State	381	10-31-25

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

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

Chain of Custody Record

Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:

Company: AECOM Technical Services Inc	PWSID:
Address: 6200 S. Quebec Street	Due Date Requested:
City: Greenwood Village	TAT Requested (days):
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474
Project Name: Basin 2024 Support	Project #: 28020759
Site:	SSOW#:

Analysis Requested

280-197290 Chain of Custody

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A - Metals	2540C_Calcd - TDS	pH	Total Number of containers
			Preservation Code:				D	D	N	D	N	N	
MW-14B-09252024	9/25/24	1445	G	W			X	X	X	X	X	X	6
MW-20B-09252024		1540					X	X	X	X	X	X	6
MW-37B-09252024		1620					X	X	X	X	X	X	6
MW-49B-09252024		1730					X	X	X	X	X	X	6
MW-53BR-09262024	9/26/24	1245					X	X	X	X	X	X	6
MW-52B-09262024		1320					X	X	X	X	X	X	6
MW-32B-09262024		1430					X	X	X	X	X	X	6
MW-39B-09262024		1515					X	X	X	X	X	X	6
MW-40B-09262024		1550					X	X	X	X	X	X	6
MW-41B-09262024		1640					X	X	X	X	X	X	6
MW-47B-09262024		1720					X	X	X	X	X	X	6

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

Sample Disposal (A fee may be assessed if samples are retaine
☐ Return To Client ☐ Disposal By Lab ☐ Archi

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

Special Instructions/QC Requirements:

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

Relinquished by: Date/Time: Received by: Date/Time:

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

Chain of Custody Record

Client Information	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):
Client Contact: Ms. Katie Abbott	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin:

Company: AECOM Technical Services Inc	PWSID:
Address: 6200 S. Quebec Street	Due Date Requested:
City: Greenwood Village	TAT Requested (days):
State, Zip: CO, 80111	Compliance Project: Δ Yes Δ No
Phone: 616-574-8327(Tel)	PO #: Purchase Order No:147145
Email: katie.abbott@aecom.com	WO #: AECOM Project# 60632474
Project Name: Basin 2024 Support	Project #: 28020759
Site:	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226 - Ra226	9320_Ra228 - Ra228	9056A_28D - Chloride, Fluoride, Sulfate	6010D, 6020B, 7470A - Metals	2540C_Calcd - TDS	pH	Total Number of containers
			Preservation Code:				D	D	N	D	N	N	
MW-45B-09262024	9/26/24	1800	G	W			X	X	X	X	X	X	6
MW-44B-09262024		1835					X	X	X	X	X	X	6
MW-42B-09262024		0920					X	X	X	X	X	X	6
MW-43B-09262024		1000					X	X	X	X	X	X	6
MW-46B-09272024	9/27/24	0900					X	X	X	X	X	Y	6
MW-36B-09272024		0935					X	X	X	X	X	X	6
MW-21B-09272024		1000				X	X	X	Y	X	X	X	18
MW-37B-09272024		1100					X	X	X	X	X	X	6
Dup-01-09272024		—					X	X	X	X	X	X	6
MW-38C-09272024		1145					X	X	X	X	X	X	6
EB-09272024		1200					X	X	X	X	X	X	6

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

Sample Disposal (A fee may be assessed if samples are retain
☐ Return To Client ☐ Disposal By Lab ☐ Arc

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

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by:	Date/Time: 1630 9/27/24	Received by:	Date/Time: 09/27

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-718150.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin: Colorado	Page: Page 1 of 3
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-197290-1
Address: 13715 Rider Trail North,	Due Date Requested: 10/29/2024			Preservation Codes:
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-14B-09252024 (280-197290-1)	9/25/24	14:45 Mountain	G	Water			X	X	X	2	
MW-20B-09252024 (280-197290-2)	9/25/24	15:40 Mountain	G	Water			X	X	X	2	
MW-37B-09252024 (280-197290-3)	9/25/24	16:20 Mountain	G	Water			X	X	X	2	
MW-49B-09252024 (280-197290-4)	9/25/24	17:30 Mountain	G	Water			X	X	X	2	
MW-53BR-09262024 (280-197290-5)	9/26/24	12:45 Mountain	G	Water			X	X	X	2	
MW-52B-09262024 (280-197290-6)	9/26/24	13:20 Mountain	G	Water			X	X	X	2	
MW-32B-09262024 (280-197290-7)	9/26/24	14:30 Mountain	G	Water			X	X	X	2	
MW-39B-09262024 (280-197290-8)	9/26/24	15:15 Mountain	G	Water			X	X	X	2	
MW-40B-09262024 (280-197290-9)	9/26/24	15:50 Mountain	G	Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/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 attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Michael Nuñez	09/23/2024 14:01	GET Dyn	Sierra Worthington	OCT 01 2024 0900	GTASR
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

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

Ver: 05/06/2024

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-736-0100 Fax: 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: McEntee, Patrick J	Carrier Tracking No(s):	COC No: 280-718150.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Patrick.McEntee@et.eurofinsus.com	State of Origin: Colorado	Page: Page 2 of 3
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): NELAP - Oregon		Job #: 280-197290-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 10/29/2024			Preservation Codes: -
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Basin 2024 Support	Project #: 28020759			
Site:	SSOW#:			Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9315_Ra226/PrecSep_21 Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	Ra226Ra228_GFPC	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
MW-41B-09262024 (280-197290-10)	9/26/24	16:40 Mountain	G	Water			X	X	X	2	
MW-47B-09262024 (280-197290-11)	9/26/24	17:20 Mountain	G	Water			X	X	X	2	
MW-45B-09262024 (280-197290-12)	9/26/24	18:00 Mountain	G	Water			X	X	X	2	
MW-44B-09262024 (280-197290-13)	9/26/24	18:35 Mountain	G	Water			X	X	X	2	
MW-42B-09262024 (280-197290-14)	9/26/24	09:20 Mountain	G	Water			X	X	X	2	
MW-43B-09262024 (280-197290-15)	9/26/24	10:00 Mountain	G	Water			X	X	X	2	
MW-46B-09272024 (280-197290-16)	9/27/24	09:00 Mountain	G	Water			X	X	X	2	
MW-36B-09272024 (280-197290-17)	9/27/24	09:35 Mountain	G	Water			X	X	X	2	
MW-21B-09272024 (280-197290-18)	9/27/24	10:00 Mountain	G	Water			X	X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/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 attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica.

Possible Hazard Identification
Unconfirmed

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

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

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

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Michael Nelson-2	09/30/2024 14:08	EETDEN	Sierra Worthington	OCT 01 2024 0900	ETASR

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

Ver: 05/06/2024

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc

Job Number: 280-197290-1

Login Number: 197290
List Number: 1
Creator: Roehsner, Karen P

List Source: Eurofins Denver

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

Login Sample Receipt Checklist

Client: AECOM Technical Services Inc

Job Number: 280-197290-1

Login Number: 197290
List Number: 2
Creator: Worthington, Sierra M

List Source: Eurofins St. Louis
List Creation: 10/01/24 01:54 PM

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

Tracer/Carrier Summary

Client: AECOM Technical Services Inc
Project/Site: Basin 2024 Support

Job ID: 280-197290-1

Method: 9315 - Radium-226 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (30-110)
280-197290-1	MW-14B-09252024	94.1
280-197290-2	MW-20B-09252024	98.5
280-197290-3	MW-37B-09252024	86.6
280-197290-4	MW-49B-09252024	97.2
280-197290-5	MW-53BR-09262024	85.1
280-197290-6	MW-52B-09262024	86.3
280-197290-7	MW-32B-09262024	95.6
280-197290-8	MW-39B-09262024	97.2
280-197290-9	MW-40B-09262024	95.6
280-197290-10	MW-41B-09262024	96.6
280-197290-11	MW-47B-09262024	91.0
280-197290-12	MW-45B-09262024	78.1
280-197290-13	MW-44B-09262024	89.2
280-197290-14	MW-42B-09262024	89.7
280-197290-15	MW-43B-09262024	101
280-197290-16	MW-46B-09272024	79.6
280-197290-17	MW-36B-09272024	90.5
280-197290-18	MW-21B-09272024	93.3
280-197290-18 MS	MW-21B-09272024	99.7
280-197290-18 MSD	MW-21B-09272024	93.8
280-197290-19	MW-38B-09272024	96.1
280-197290-20	DUP-01-09272024	101
280-197290-21	MW-38C-09272024	90.5
280-197290-21 DU	MW-38C-09272024	92.8
280-197290-22	EB-09272024	95.4
LCS 160-681942/2-A	Lab Control Sample	94.3
LCS 160-681944/2-A	Lab Control Sample	86.1
MB 160-681942/1-A	Method Blank	92.5
MB 160-681944/1-A	Method Blank	100

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Water

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
280-197290-1	MW-14B-09252024	94.1	80.7
280-197290-2	MW-20B-09252024	98.5	82.6
280-197290-3	MW-37B-09252024	86.6	78.9
280-197290-4	MW-49B-09252024	97.2	82.6
280-197290-5	MW-53BR-09262024	85.1	78.9
280-197290-6	MW-52B-09262024	86.3	82.6
280-197290-7	MW-32B-09262024	95.6	81.1
280-197290-8	MW-39B-09262024	97.2	82.2
280-197290-9	MW-40B-09262024	95.6	83.4
280-197290-10	MW-41B-09262024	96.6	79.6
280-197290-11	MW-47B-09262024	91.0	83.0

Tracer/Carrier Summary

Client: AECOM Technical Services Inc
Job ID: 280-197290-1
Project/Site: Basin 2024 Support

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

Matrix: Water
Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (30-110)	Y (30-110)
280-197290-12	MW-45B-09262024	78.1	83.0
280-197290-13	MW-44B-09262024	89.2	73.6
280-197290-14	MW-42B-09262024	89.7	80.0
280-197290-15	MW-43B-09262024	101	78.9
280-197290-16	MW-46B-09272024	79.6	86.4
280-197290-17	MW-36B-09272024	90.5	82.6
280-197290-18	MW-21B-09272024	93.3	81.9
280-197290-18 MS	MW-21B-09272024	99.7	85.2
280-197290-18 MSD	MW-21B-09272024	93.8	85.2
280-197290-19	MW-38B-09272024	96.1	81.9
280-197290-20	DUP-01-09272024	101	81.9
280-197290-21	MW-38C-09272024	90.5	68.8
280-197290-21 DU	MW-38C-09272024	92.8	72.1
280-197290-22	EB-09272024	95.4	81.9
LCS 160-681945/2-A	Lab Control Sample	86.1	81.1
LCS 160-681953/2-A	Lab Control Sample	94.3	74.4
MB 160-681945/1-A	Method Blank	100	81.9
MB 160-681953/1-A	Method Blank	92.5	74.0

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

AECOM Environment

Submitted to:
Basin Electric Laramie River Station

Submitted by:
AECOM
Denver, CO

July 2024
Inorganic and Radiochemistry Limited Data Validation Report

Basin Electric Laramie, Wyoming
First Semi-Annual Groundwater Monitoring 2024
Analyzed by Eurofins Environment Testing

Prepared By Jamie Herman
Project Chemist

Overview

The samples collected, analyzed, and validated during the semi-annual groundwater monitoring event are listed in the Table of Samples Validated.

Samples were submitted to Eurofins Environment Testing in Denver, Colorado and Eurofins Environment Testing in Saint Louis, Missouri.

Data were evaluated using guidance set forth in the *National Functional Guidelines for Inorganic Superfund Methods Data Review*, (November 2020), method requirements, and laboratory criteria, as applicable.

The following data components were reviewed during the data validation procedure:

Submitted Deliverables
Case Narratives (including any assigned laboratory flags)
Chain-of-Custody form(s) and sample integrity
Sample results, reporting limits, dilution factors
Holding times
Method (preparation) blank results
Field blank results
Laboratory control sample (LCS), laboratory control sample duplicate (LCSD) results
Matrix spike (MS), matrix spike duplicate (MSD) results
Laboratory duplicate (or spiked duplicate) results
Field duplicate (FD) results (calculated Relative Percent Differences [RPD])
Electronic data deliverables (EDDs) – EQuIS format

Overall Data Assessment

Field and laboratory precision, field and laboratory accuracy, method compliance, and data set completeness are determined to be acceptable based on the data reported. As no data were missing or qualified as unusable, the completeness of the data set was considered 100% and is acceptable. All other reported data are suitable for their intended use with the qualifications and clarifications noted.

Table of Samples Validated
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Laboratory Identification	Field Sample Identification	Sample Type
280-192407-1 280-192407-2	280-192407-1	MW-47B	N
	280-192407-2	MW-45B	N
	280-192407-3	MW-44B	N
	280-192407-4	MW-43B	N
	280-192407-5	MW-42B	N
	280-192407-6	MW-41B	N
	280-192407-7	MW-37B	N
	280-192407-8	MW-39B	N
	280-192407-9	MW-32B	N
	280-192407-10	MW-14B	N
	280-192407-11	MW-20B	N
	280-192407-12	MW-36B	N
	280-192407-13	MW-40B	N
	280-192407-14	MW-53B2	N
	280-192407-15	MW-52B	N
	280-192407-16	MW-49B	N
	280-192407-17	MW-38B	N
	280-192407-18	MW-21B	N
	280-192407-19	Dup-01	FD
	280-192407-20	MW-38C	N
	280-192407-21	Field Blank	FB
	280-192407-22	MW-46B	N

FB – Field Blank Sample
FD – Field Duplicate Sample
N – Normal Field Sample
SDG – Sample Delivery Group

Project Name: Basin Electric Laramie River Station, Wyoming	Laboratory: Eurofins Environment Testing in Denver, Colorado, and Eurofins Environment Testing in Saint Louis, Missouri
Project Reference: Semi-Annual Groundwater Monitoring	Sample Matrix: Groundwater
AECOM Project: 60732883.1.3	Sample Start Date: 6/4/2024
Validator/Date Validated: Jamie Herman, 7/19/2024	Sample End Date: 6/5/2024
Secondary Review by: Cheyana Cokley	Secondary Review Date: 7/23/2024
Samples Validated: **See Table of Samples Validated**	
Parameters Validated: Total Metals by SW-846 Methods 6010C, 6020A, and 7470A, Anions (Chloride, Fluoride, and Sulfate) by SW-846 Method 9056A, TDS by SM2540C, Radium-226 by SW-846 Method 9315, Radium-228 by SW-846 Method 9320, and Combined Radium	
Sample Delivery Groups (SDGs): 280-192407-1, 280-192407-2	

PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT

Precision:	**X**	Acceptable		Unacceptable	JH	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was evaluated by reviewing the field duplicate results, and laboratory precision was evaluated by reviewing method duplicate sample results, laboratory control sample (LCS) to LCS duplicate (LCSD) results, and matrix spike (MS) to MS duplicate (MSD) results. Laboratory criteria was used to evaluate laboratory precision. Field and laboratory precision is acceptable as majority of the results are unqualified, and no data are missing or rejected. Precision measurements are reviewed in items 17 and 21.						
Accuracy:	**X**	Acceptable		Unacceptable	JH	Initials
Comments: Field accuracy, a measure of the sampling bias, can be determined by reviewing field and equipment blank results for evidence of sample contamination stemming from sampling activities and/or field conditions. Laboratory accuracy is a measure of the system bias, and was measured by evaluating LCS/LCSD, MS/MSD, tracer (radiological) percent recoveries (%Rs). LCS/LCSD %Rs demonstrated the overall performance of the analysis. MS/MSD and tracer %Rs provided information on sample matrix interferences. Accuracy measurements were evaluated using laboratory control limits. Overall field and laboratory accuracy is acceptable because the majority of the results are unqualified, and no data are missing or rejected. Accuracy measurements are reviewed in items 12, 14, 15, 16, and 20.						
Method Compliance:	**X**	Acceptable		Unacceptable	JH	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. Overall method compliance is acceptable because the majority of the results were unqualified, and no data were missing or rejected. Method compliance measurements are also reviewed in items 4, 6, 8, 11, 13, 18, 19, 20, and 22.						
Completeness:	**X**	Acceptable		Unacceptable	JH	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of chain of custody records, laboratory analytical methods and reporting limits, laboratory case narratives, and project requirements. Completeness also included review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). The completeness of the data set was considered 100% and is acceptable. All other reported data are suitable for their intended use as reported with the clarifications and qualifications noted.						

VALIDATION CRITERIA CHECK

Data validation qualifiers potentially assigned during this review:

- J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
- J+ The result is an estimated quantity, but the result may be biased high.
- J- The result is an estimated quantity, but the result may be biased low.
- R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
- U The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.
- UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	JH	Initials
Comments: Data qualification, if any, related to the narrative comments and/or assigned laboratory flags contained in the analytical reports are discussed in the following sections.						
2. Were sample Chain-of-Custody (COC) forms complete?	**X**	Yes		No	JH	Initials
Comments: No issues were observed, and custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?	**X**	Yes		No	JH	Initials
Comments: All requested analyses were completed by the laboratory.						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	JH	Initials
Comments: All samples were received intact and within the recommended <6°C temperature, as applicable to the Methods.						
5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	JH	Initials
Comments: The reported target analytes and methods complied with parameters and methods listed on the COC.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?		Yes	**X**	No	JH	Initials

Comments: No sample results were reported as non-detect at elevated reporting limits.

Trace level detections, results reported between the method detection limit (MDL) and the reporting limit (RL) were qualified as estimated (J lq).

For radiological parameters:

- If the associated uncertainty was less than the reported result, no qualification was necessary.
- If the associated uncertainty was greater than the reported result, and the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit, no qualification was necessary.
- If the associated uncertainty was greater than the reported result, and the 2 σ uncertainty multiplied by 1.65 was greater than the specified detection limit, then the associated sample and qualifications are included in the table below.

Samples	Analyte	Result (pCi/L)	± 2 Sigma (σ) Uncertainty	MDC (pCi/L)	Qualification
Data Package 280-192407-2					
Field Blank	Combined Radium 226/228	0.372	0.64185	0.629	As the 2σ uncertainty multiplied by 1.65 was greater than the reported minimum detectable concentration (MDC), the
	Radium-228	0.338	0.63525	0.629	

VALIDATION CRITERIA CHECK

MW-14B	Combined Radium 226/228	0.264	0.4587	0.445	associated results were qualified as estimated (J v).
	Radium-228	0.225	0.44715	0.445	
MW-20B	Radium-228	0.294	0.4884	0.473	
MW-37B	Radium-228	0.269	0.5214	0.518	
MW-38B	Combined Radium 226/228	0.314	0.6204	0.616	
MW-38C	Combined Radium 226/228	0.247	0.53295	0.526	
MW-39B	Radium-226	0.0716	0.133155	0.13	
	Radium-228	0.304	0.52635	0.516	
MW-42B	Combined Radium 226/228	0.32	0.5511	0.546	
MW-49B	Combined Radium 226/228	0.301	0.5511	0.521	
	Radium-228	0.325	0.5379	0.521	

σ – Sigma
± – Plus or Minus
MDC – Minimum Detectable Concentration
pCi/L – Picocuries per Liter
J – Estimated Concentration
v – Compound Identification Issue

Refer to the Table of Qualified Analytical Results.

7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	JH	Initials
Comments: Only the requested target analytes were reported.						
8. Were sample holding times met?	**X**	Yes		No	JH	Initials
Comments: The sample preparation and analytical holding times were within the Method requirements.						
9. Were correct concentration units reported?	**X**	Yes		No	JH	Initials
Comments: Yes, the correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	JH	Initials
Comments: Laboratory flags were reviewed and considered during the data validation procedure. Data validation qualifiers override assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?		Yes	**X**	No	JH	Initials

Comments: With the following exceptions, the laboratory blanks were free of target analyte contamination, and radiological parameter results were less than the MDC.

Laboratory Blank/ Associated Samples	Analyte	Concentration	Qualification
Data Package 280-192407-1			
MB 280-656144/1-A MW-47B MW-45B MW-44B MW-43B MW-42B MW-41B MW-37B MW-39B MW-32B MW-14B MW-20B MW-36B MW-40B MW-53B2 MW-52B MW-49B MW-38B MW-21B Dup-01 MW-38C	Calcium	26.17 µg/L	As the associated sample results were reported at concentrations >10x the blank concentration, data qualification was not considered necessary.

VALIDATION CRITERIA CHECK

MB 280-656150/1-A Field Blank MW-46B	Calcium	37.45 µg/L	The result for sample Field Blank was below the RL and was qualified as non-detected at the RL (U bl).
MB 280-656150/1-A MW-46B	Chromium	1.180 µg/L	As the associated sample result was reported at concentrations >10x the blank concentration, data qualification was not considered necessary.

≥ – Greater Than or Equal To
> - Greater Than
µg/L – Micrograms per Liter
bl – Laboratory Blank Contamination
MB – Method Blank
U – Non-Detect

Refer to the Table of Qualified Analytical Results.

12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?		Yes	**X**	No	JH	Initials

Comments: A trip blank and equipment blank were not required for this sampling event.

One field blank was collected, and with the exception noted below, the field blank was free of target analyte contamination, and radiological parameter results were less than the MDC.

Field Blank/ Associated Samples	Analyte	Concentration	Qualification
Field Blank All Samples	Total Dissolved Solids	11.0 mg/L	The associated sample results were reported at concentrations >10x the blank contamination, qualification was not considered necessary.

≥ – Greater Than or Equal To
mg/L – Milligrams per Liter

13. Were instrument calibrations within method or data validation control limits?	**NA**	Yes	**NA**	No	JH	Initials

Comments: Not applicable for the level of limited validation.

14. Were surrogate/tracer recoveries within control limits?	**X**	Yes		No	JH	Initials

Comments: The associated tracer recoveries were within control limits. Surrogate recoveries are not applicable for the analytical methods reported.

15. Were laboratory control sample recoveries and relative percent difference (RPDs) within control limits?	**X**	Yes		No	JH	Initials

Comments: LCS and/or LCSD percent recoveries and RPDs were within laboratory control limits.

16. Were matrix spike recoveries and RPDs within control limits?		Yes	**X**	No	JH	Initials

Comments: A matrix spike/matrix spike duplicate (MS/MSD) was performed on the following samples:

- MW-20B for total metals, chloride, fluoride, sulfate, radium-226, and radium-228
- MW-38B for chloride, fluoride, sulfate

With the exceptions listed in the table below, the MS/MSD spike recoveries and RPDs were within laboratory control limits.

Associated Sample	Analyte	Recovery (Limits)	RPD (Limits)	Comment
Data Package 280-192407-1				
MW-20B	Cobalt	90/91 (94-115)	0 (20)	As the potential bias was low, the associated sample results were qualified as estimated (UJ/J- m).
	Chromium	90/90 (91-114)	0 (20)	

J- – Estimated Concentration, Biased Low
m – Matrix spike/matrix spike duplicate recovery outlier
RPD – Relative Percent Difference
UJ – Estimated non detect

Refer to the Table of Qualified Analytical Results.

17. Were laboratory duplicate RPDs and/or serial dilution %Ds within control limits?	**X**	Yes		No	JH	Initials

Comments: Laboratory duplicates were performed for anions, total dissolved solids, and radiological analyses and met laboratory control limits. Serial dilutions were not evaluated for this level of limited validation.

18. Were organic system performance criteria met?	**NA**	Yes	**NA**	No	JH	Initials

VALIDATION CRITERIA CHECK						
Comments: Not applicable for this level of limited validation, or for the methods reported.						
19. Were internal standards within method criteria for ICP-MS sample analyses?	**NA**	Yes	**NA**	No	JH	Initials
Comments: Not evaluated for this level of limited data validation.						
20. Were system performance criteria met?	**NA**	Yes	**NA**	No	JH	Initials
Comments: Not evaluated for this level of limited validation.						
21. Were field duplicates collected? If so, discuss the precision (RPD and/or RER) of the results.	**X**	Yes		No	JH	Initials
Duplicate Sample	Dup-01	Primary Sample		MW-38B		
Comments: The duplicate sample pair met the acceptance criteria. The following criteria was used to evaluate the field duplicate results: • For results where both reported values were greater than five times the reporting limit (RL), the relative percent difference (RPD) between the results were ≤30%. • For results where either value reported was less than five times the RL, the absolute difference between the results was compared to a criterion of agreement within ±2xRL. • The replicate error ratio (RER) for radiochemical parameters was ≤2.						
22. Were qualitative criteria for organic target analyte identification met?	**NA**	Yes	**NA**	No	JH	Initials
Comments: Not applicable for this level of limited data validation or for the methods reported.						
23. Were 10% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		No	JH	Initials
Comments: During the validation procedure, 10% of the positive sample concentrations and RLs for project samples were compared to hardcopy laboratory reports.						

Table of Qualified Analytical Results
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Sample Identification	Laboratory Identification	Analytical Method	Analyte	Flag	Reason Code
280-192407-1	MW-47B_060424	280-192407-1	SW6020B	Antimony	J	lq
280-192407-1	MW-47B_060424	280-192407-1	SW6020B	Arsenic	J	lq
280-192407-1	MW-47B_060424	280-192407-1	SW9056A	Fluoride	J	lq
280-192407-2	MW-14B_060524	280-192407-10	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	MW-14B_060524	280-192407-10	SW6020B	Arsenic	J	lq
280-192407-1	MW-14B_060524	280-192407-10	SW9056A	Fluoride	J	lq
280-192407-2	MW-14B_060524	280-192407-10	SW9320	Radium-228	J	v
280-192407-1	MW-20B_060524	280-192407-11	SW6020B	Arsenic	J	lq
280-192407-1	MW-20B_060524	280-192407-11	SW6020B	Chromium	J-	m,lq
280-192407-1	MW-20B_060524	280-192407-11	SW6020B	Cobalt	UJ	m
280-192407-1	MW-20B_060524	280-192407-11	SW6020B	Selenium	J	lq
280-192407-2	MW-20B_060524	280-192407-11	SW9320	Radium-228	J	v
280-192407-1	MW-36B_060524	280-192407-12	SW6020B	Arsenic	J	lq
280-192407-1	MW-36B_060524	280-192407-12	SW6020B	Beryllium	J	lq
280-192407-1	MW-36B_060524	280-192407-12	SW6020B	Cadmium	J	lq
280-192407-1	MW-36B_060524	280-192407-12	SW6020B	Chromium	J	lq
280-192407-1	MW-36B_060524	280-192407-12	SW6020B	Thallium	J	lq
280-192407-1	MW-40B_060524	280-192407-13	SW6020B	Antimony	J	lq
280-192407-1	MW-40B_060524	280-192407-13	SW6020B	Chromium	J	lq
280-192407-1	MW-40B_060524	280-192407-13	SW6020B	Selenium	J	lq
280-192407-1	MW-53B2_060524	280-192407-14	SW6020B	Arsenic	J	lq
280-192407-1	MW-53B2_060524	280-192407-14	SW6020B	Beryllium	J	lq
280-192407-1	MW-53B2_060524	280-192407-14	SW6020B	Selenium	J	lq
280-192407-1	MW-52B_060524	280-192407-15	SW6020B	Arsenic	J	lq
280-192407-1	MW-52B_060524	280-192407-15	SW6020B	Selenium	J	lq
280-192407-1	MW-52B_060524	280-192407-15	SW9056A	Fluoride	J	lq
280-192407-2	MW-49B_060524	280-192407-16	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	MW-49B_060524	280-192407-16	SW6020B	Arsenic	J	lq
280-192407-1	MW-49B_060524	280-192407-16	SW6020B	Chromium	J	lq
280-192407-1	MW-49B_060524	280-192407-16	SW9056A	Fluoride	J	lq
280-192407-2	MW-49B_060524	280-192407-16	SW9320	Radium-228	J	v
280-192407-2	MW-38B_060524	280-192407-17	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	MW-38B_060524	280-192407-17	SW6020B	Arsenic	J	lq
280-192407-1	MW-38B_060524	280-192407-17	SW6020B	Cobalt	J	lq
280-192407-1	MW-21B_060524	280-192407-18	SW6020B	Arsenic	J	lq
280-192407-1	Dup-01_060524	280-192407-19	SW6020B	Arsenic	J	lq
280-192407-1	Dup-01_060524	280-192407-19	SW6020B	Cobalt	J	lq
280-192407-1	MW-45B_060424	280-192407-2	SW6020B	Arsenic	J	lq
280-192407-1	MW-45B_060424	280-192407-2	SW6020B	Chromium	J	lq
280-192407-2	MW-38C_060524	280-192407-20	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	MW-38C_060524	280-192407-20	SW6010D	Boron	J	lq
280-192407-1	MW-38C_060524	280-192407-20	SW6020B	Arsenic	J	lq
280-192407-1	MW-38C_060524	280-192407-20	SW6020B	Chromium	J	lq
280-192407-2	Field Blank_060524	280-192407-21	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	Field Blank_060524	280-192407-21	SW6010D	Calcium	U	bl
280-192407-2	Field Blank_060524	280-192407-21	SW9320	Radium-228	J	v
280-192407-1	MW-46B_060524	280-192407-22	SW6010D	Boron	J	lq
280-192407-1	MW-46B_060524	280-192407-22	SW6020B	Arsenic	J	lq
280-192407-1	MW-46B_060524	280-192407-22	SW6020B	Selenium	J	lq
280-192407-1	MW-44B_060424	280-192407-3	SW6020B	Arsenic	J	lq
280-192407-1	MW-44B_060424	280-192407-3	SW9056A	Fluoride	J	lq
280-192407-1	MW-43B_060424	280-192407-4	SW6020B	Arsenic	J	lq
280-192407-1	MW-43B_060424	280-192407-4	SW6020B	Chromium	J	lq
280-192407-1	MW-43B_060424	280-192407-4	SW6020B	Selenium	J	lq
280-192407-2	MW-42B_060424	280-192407-5	RA226RA228	Combined Radium 226 + 228	J	v
280-192407-1	MW-42B_060424	280-192407-5	SW6020B	Arsenic	J	lq
280-192407-1	MW-41B_060424	280-192407-6	SW6020B	Arsenic	J	lq
280-192407-1	MW-41B_060424	280-192407-6	SW6020B	Cobalt	J	lq
280-192407-1	MW-37B_060424	280-192407-7	SW6020B	Arsenic	J	lq
280-192407-1	MW-37B_060424	280-192407-7	SW9056A	Fluoride	J	lq
280-192407-2	MW-37B_060424	280-192407-7	SW9320	Radium-228	J	v
280-192407-1	MW-39B_060424	280-192407-8	SW6020B	Arsenic	J	lq
280-192407-1	MW-39B_060424	280-192407-8	SW6020B	Chromium	J	lq
280-192407-1	MW-39B_060424	280-192407-8	SW6020B	Selenium	J	lq
280-192407-2	MW-39B_060424	280-192407-8	SW9315	Radium-226	J	v
280-192407-2	MW-39B_060424	280-192407-8	SW9320	Radium-228	J	v

Table of Qualified Analytical Results
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Sample Identification	Laboratory Identification	Analytical Method	Analyte	Flag	Reason Code
280-192407-1	MW-32B_060424	280-192407-9	SW6020B	Arsenic	J	lq
280-192407-1	MW-32B_060424	280-192407-9	SW6020B	Chromium	J	lq
280-192407-1	MW-32B_060424	280-192407-9	SW6020B	Selenium	J	lq

Flag Definitions

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J- - The result is an estimated quantity, but the result may be biased low.

U –

UJ – The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason Code Definitions

bl – Laboratory Blank Contamination

lq – Trace Value

m – Matrix Spike Recovery Outliers

v – Compound Identification Issue

AECOM Environment

Submitted to:
Basin Electric Laramie River Station

Submitted by:
AECOM
Denver, CO

September 2024
Inorganic and Radiochemistry
Limited Data Validation Report

Basin Electric Laramie, Wyoming
Second Semi-Annual Groundwater Monitoring 2024
Analyzed by Eurofins Environment Testing

Prepared By Delaine Austin
AECOM Chemist

Overview

The samples collected, analyzed, and validated during the semi-annual groundwater monitoring event are listed in the Table of Samples Validated.

Samples were submitted to Eurofins Environment Testing in Denver, Colorado and Eurofins Environment Testing in Saint Louis, Missouri.

Data were evaluated using guidance set forth in the *National Functional Guidelines for Inorganic Superfund Methods Data Review*, (November 2020), method requirements, and laboratory criteria, as applicable.

The following data components were reviewed during the data validation procedure:

Submitted Deliverables
Case Narratives (including any assigned laboratory flags)
Chain-of-Custody form(s) and sample integrity
Sample results, reporting limits, dilution factors
Holding times
Method (preparation) blank results
Field blank results
Laboratory control sample (LCS), laboratory control sample duplicate (LCSD) results
Matrix spike (MS), matrix spike duplicate (MSD) results
Laboratory duplicate (or spiked duplicate) results
Field duplicate (FD) results (calculated Relative Percent Differences [RPD])
Electronic data deliverables (EDDs) – EQuIS format

Overall Data Assessment

Field and laboratory precision, field and laboratory accuracy, method compliance, and data set completeness are determined to be acceptable based on the data reported. As no data were missing or qualified as unusable, the completeness of the data set was considered 100% and is acceptable. All other reported data are suitable for their intended use with the qualifications and clarifications noted.

Table of Samples Validated
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Laboratory Identification	Field Sample Identification	Sample Type
280-197290-1 280-197290-2	280-197290-1	MW-14B-09252024	N
	280-197290-2	MW-20B-09252024	N
	280-197290-3	MW-37B-09252024	N
	280-197290-4	MW-49B-09252024	N
	280-197290-5	MW-53BR-09262024	N
	280-197290-6	MW-52B-09262024	N
	280-197290-7	MW-32B-09262024	N
	280-197290-8	MW-39B-09262024	N
	280-197290-9	MW-40B-09262024	N
	280-197290-10	MW-41B-09262024	N
	280-197290-11	MW-47B-09262024	N
	280-197290-12	MW-45B-09262024	N
	280-197290-13	MW-44B-09262024	N
	280-197290-14	MW-42B-09262024	N
	280-197290-15	MW-43B-09262024	N
	280-197290-16	MW-46B-09272024	N
	280-197290-17	MW-36B-09272024	N
	280-197290-18	MW-21B-09272024	N
	280-197290-19	MW-38B-09272024	N
	280-197290-20	DUP-01-09272024	FD
	280-197290-21	MW-38C-09272024	N
	280-197290-22	EB-09272024	EB

EB – Equipment Blank Sample
FD – Field Duplicate Sample
N – Normal Field Sample
SDG – Sample Delivery Group

Project Name: Basin Electric Laramie River Station, Wyoming				Laboratory: Eurofins Environment Testing in Denver, Colorado, and in St Louis, Missouri		
Project Reference: Semi-Annual Groundwater Monitoring				Sample Matrix: Groundwater		
AECOM Project: 60732883.1.2				Sample Start Date: 9/25/2024		
Validator/Date Validated: Delaine Austin 11/7/2024				Sample End Date: 9/27/2024		
Secondary Review by: Jamie Herman				Secondary Review Date: 11/11/2024		
Samples Validated: **See Table of Samples Validated**						
Parameters Validated: Total Metals by SW-846 Methods 6010D, 6020B, and 7470A, Anions (Chloride, Fluoride, and Sulfate) by SW-846 Method 9056A, TDS by SM2540C, Radium-226 by SW-846 Method 9315, Radium-228 by SW-846 Method 9320, and Combined Radium						
Sample Delivery Groups (SDGs): 280-197290-1, 280-197290-2,						
PRECISION, ACCURACY, METHOD COMPLIANCE, AND COMPLETENESS ASSESSMENT						
Precision:	**X**	Acceptable		Unacceptable	DA	Initials
Comments: Precision is the measure of variability of individual sample measurements. Field precision was evaluated by reviewing the field duplicate results, and laboratory precision was evaluated by reviewing method duplicate sample results, laboratory control sample (LCS) to LCS duplicate (LCSD) results, and matrix spike (MS) to MS duplicate (MSD) results. Laboratory criteria was used to evaluate laboratory precision. Field and laboratory precision is acceptable as majority of the results are unqualified, and no data are missing or rejected. Precision measurements are reviewed in items 17 and 21.						
Accuracy:	**X**	Acceptable		Unacceptable	DA	Initials
Comments: Field accuracy, a measure of the sampling bias, can be determined by reviewing field and equipment blank results for evidence of sample contamination stemming from sampling activities and/or field conditions. Laboratory accuracy is a measure of the system bias, and was measured by evaluating LCS/LCSD, MS/MSD, tracer (radiological) percent recoveries (%Rs). LCS/LCSD %Rs demonstrated the overall performance of the analysis. MS/MSD and tracer %Rs provided information on sample matrix interferences. Accuracy measurements were evaluated using laboratory control limits. Overall field and laboratory accuracy is acceptable because the majority of the results are unqualified, and no data are missing or rejected. Accuracy measurements are reviewed in items 12, 14, 15, 16, and 20.						
Method Compliance:	**X**	Acceptable		Unacceptable	DA	Initials
Comments: Method compliance was determined by evaluating sample integrity, holding time, reporting limits, and laboratory blanks against method specified requirements. Overall method compliance is acceptable because the majority of the results were unqualified, and no data were missing or rejected. Method compliance measurements are also reviewed in items 4, 6, 8, 11, 13, 18, 19, 20, and 22.						
Completeness:	**X**	Acceptable		Unacceptable	DA	Initials
Comments: Completeness is the overall ratio of the number of samples planned versus the number of samples with valid analyses. Determination of completeness included a review of chain of custody records, laboratory analytical methods and reporting limits, laboratory case narratives, and project requirements. Completeness also included review of the laboratory sample data results, QC summary reports, and electronic data deliverables (EDDs). The completeness of the data set was considered 100% and is acceptable. All other reported data are suitable for their intended use as reported with the clarifications and qualifications noted.						

VALIDATION CRITERIA CHECK

Data validation qualifiers potentially assigned during this review:

J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.
R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for, but was not detected above the level of the adjusted detection limit or quantitation limit, as appropriate.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

1. Did the laboratory identify any non-conformances related to the analytical results?	**X**	Yes		No	DA	Initials
Comments: Data qualification, if any, related to the narrative comments and/or assigned laboratory flags contained in the analytical reports are discussed in the following sections.						
2. Were sample Chain-of-Custody (COC) forms complete?	**X**	Yes	**X**	No	DA	Initials
Comments: Custody was maintained as evidenced by field and laboratory personnel signatures, dates, and times of receipt.						
3. Were all the analyses requested for the samples on the COCs completed by the laboratory?		Yes	**X**	No	DA	Initials
Comments: All requested analyses, excluding those cancelled per request, were completed by the laboratory. **Data Package 280-197290-2:** The laboratory noted that pH analysis was included on the COC but subsequently cancelled as the parameter is performed in the field at the time of sample collection.						
4. Were samples received in good condition and at the appropriate temperature?	**X**	Yes		No	DA	Initials
Comments: All samples were received intact and within the recommended <6°C temperature, as applicable to the Methods.						
5. Were the reported analytical methods in compliance with WP/QAPP, permit, or COC?	**X**	Yes		No	DA	Initials
Comments: The reported target analytes and methods complied with parameters and methods listed on the COC.						
6. Were detection limits in accordance with WP/QAPP, permit, or method?		Yes	**X**	No	DA	Initials

Comments: No sample results were reported as non-detect at elevated reporting limits.

Trace level detections, results reported between the method detection limit (MDL) and the reporting limit (RL) were qualified as estimated (J lq).

For radiological parameters:

- If the associated uncertainty was less than the reported result, no qualification was necessary.
- If the associated uncertainty was greater than the reported result, and the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit, no qualification was necessary.
- If the associated uncertainty was greater than the reported result, and the 2 σ uncertainty multiplied by 1.65 was greater than the specified detection limit, then the associated sample and qualifications are included in the table below.

VALIDATION CRITERIA CHECK

Samples	Analyte	Result (pCi/L)	± 2 Sigma (σ) Uncertainty	MDC (pCi/L)	Qualification
Data Package 280-197290-1					
MW-20B-09252024	Combined Radium 226/228	0.319	0.336	0.5544	As the 2σ uncertainty multiplied by 1.65 was greater than the reported minimum detectable concentration (MDC), the associated results were qualified as estimated (J v).
	Radium-228	0.281	0.329	0.54285	
MW-38B-09272024	Radium-228	0.293	0.353	0.58245	
MW-38C-09272024	Radium-228	0.38	0.426	0.7029	
MW-41B-09262024	Combined Radium 226/228	0.34	0.365	0.60225	
	Radium-228	0.311	0.355	0.58575	
MW-49B-09252024	Combined Radium 226/228	0.306	0.317	0.52305	

σ – Sigma
± – Plus or Minus
MDC – Minimum Detectable Concentration
pCi/L – Picocuries per Liter
J – Estimated Concentration
v – Compound Identification Issue

Refer to the Table of Qualified Analytical Results.

7. Do the laboratory reports include only those constituents requested to be reported for a specific analytical method?	**X**	Yes		No	DA	Initials
Comments: Only the requested target analytes were reported.						
8. Were sample holding times met?	**X**	Yes		No	DA	Initials
Comments: The sample preparation and analytical holding times were within the Method requirements.						
9. Were correct concentration units reported?	**X**	Yes		No	DA	Initials
Comments: Yes, the correct concentration units were reported.						
10. Were the reporting requirements for flagged data met?	**X**	Yes		No	DA	Initials
Comments: Laboratory flags were reviewed and considered during the data validation procedure. Data validation qualifiers override assigned laboratory flags.						
11. Were laboratory blank samples free of target analyte contamination?		Yes	**X**	No	DA	Initials

Comments: With the following exceptions, the laboratory blanks were free of target analyte contamination, and radiological parameter results were less than the MDC.

Laboratory Blank/ Associated Samples	Analyte	Concentration	Qualification
Data Package 280-197290-2			
MB 280-669240/1-A MW-38C-09272024 EB-09272024	Boron	3.486 µg/L	As the associated sample results were non-detect or reported at concentrations >10x the blank concentration, data qualification was not considered necessary.
MB 280-669287/1-A DUP-01-09272024 MW-32B-09262024 MW-36B-09272024 MW-38B-09272024 MW-38C-09272024 MW-39B-09262024 MW-40B-09262024 MW-41B-09262024 MW-42B-09262024 MW-43B-09262024 MW-44B-09262024 MW-45B-09262024 MW-46B-09272024 MW-47B-09262024 MW-49B-09252024	Total Dissolved Solids	5.000 mg/L	The associated sample results were reported at concentrations >10x the blank contamination, qualification was not considered necessary.

VALIDATION CRITERIA CHECK

MW-52B-09262024 MW-53BR-09262024			
Data Package 280-197290-1			
MB 160-681945/1-A DUP-01-09272024 MW-14B-09252024 MW-20B-09252024 MW-21B-09272024 MW-32B-09262024 MW-36B-09272024 MW-37B-09252024 MW-38B-09272024 MW-39B-09262024 MW-40B-09262024 MW-41B-09262024 MW-42B-09262024 MW-43B-09262024 MW-44B-09262024 MW-45B-09262024 MW-46B-09272024 MW-47B-09262024 MW-49B-09252024 MW-52B-09262024 MW-53BR-09262024	Radium-228	0.9058 pCi/L	For radiological parameters, where the blank concentration was > MDC, the associated sample results reported at concentrations > MDC were qualified as estimated (J+ bl). Qualification was not considered necessary for the associated samples reported at concentrations < MDC.

> - Greater Than
mg/L – Milligrams per Liter
µg/L – Micrograms per Liter
MB – Method Blank
pCi/L – Picocuries per Liter

Refer to the Table of Qualified Analytical Results.

12. Were trip blank, field blank, and/or equipment rinse blank samples free of target analyte contamination?		Yes	**X**	No	DA	Initials

Comments: A trip blank and field blank were not required for this sampling event.

One equipment blank was collected, and with the exceptions noted below, the equipment blank was free of target analyte contamination, and radiological parameter results were less than the MDC.

Equipment Blank/ Associated Samples	Analyte	Blank Concentration	Qualification
EB-09272024 All Samples	Total Dissolved Solids	20.0 mg/L	The associated sample results were reported at concentrations >10x the blank contamination, qualification was not considered necessary.
	Calcium	137 µg/L	
	Barium	1.01 µg/L	

> – Greater Than
mg/L – Milligrams per Liter
µg/L – Micrograms per Liter
EB = Equipment Blank

13. Were instrument calibrations within method or data validation control limits?	**NA**	Yes	**NA**	No	DA	Initials

Comments: Not applicable for the level of limited validation.

14. Were surrogate/tracer recoveries within control limits?	**X**	Yes		No	DA	Initials

Comments: The associated tracer recoveries were within control limits. Surrogate recoveries are not applicable for the analytical methods reported.

15. Were laboratory control sample recoveries and relative percent difference (RPDs) within control limits?		Yes	**X**	No	DA	Initials

Comments: With the exception below, the LCS and/or LCSD percent recoveries and RPDs were within laboratory control limits.

LCS Identification/ Associated Sample	Analyte	Recovery (Limits)	RPD (Limits)	Comment
Data Package 280-197290-1				
LCS 160-681953/2-A MW-38C-09272024 EB-09272024	Radium 228	**128** (75-125)	N/A	As the potential bias was high, and the associated sample results were reported at <MDC, data qualification was not necessary.

< - Less Than
MDC – Minimum Detectable Concentration
RPD – Relative Percent Difference

VALIDATION CRITERIA CHECK

16. Were matrix spike recoveries and RPDs within control limits?		Yes	**X**	No	DA	Initials

Comments: A matrix spike/matrix spike duplicate (MS/MSD) was performed on the following samples:

- MW-21B-09272024 for total metals, chloride, fluoride, sulfate, radium-226, and radium-228
- MW-40B-09262024 for chloride, fluoride

With the exceptions listed in the table below, the MS/MSD spike recoveries and RPDs were within laboratory control limits.

Results in the native sample greater than 4x the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.

Associated Sample	Analyte	Recovery (Limits)	RPD (Limits)	Comment
Data Package 280-197290-2				
MW-21B-09272024	Arsenic	**91/91** (92-112)	1 (20)	As the potential bias was low, the associated sample results were qualified as estimated (UJ/J- m).
	Selenium	**85**/99 (90-115)	11 (20)	
	Thallium	**93/**95 (94-115)	3 (20)	
	Fluoride	**79/79** (80-120)	0 (20)	

J- – Estimated Concentration, Biased Low
m – Matrix spike/matrix spike duplicate recovery outlier
RPD – Relative Percent Difference
UJ – Estimated non detect

Refer to the Table of Qualified Analytical Results.

17. Were laboratory duplicate RPDs and/or serial dilution %Ds within control limits?	**X**	Yes		No	DA	Initials

Comments: Laboratory duplicates were performed for anions, total dissolved solids, and radiological analyses and met laboratory control limits. Serial dilutions were not evaluated for this level of limited validation.

18. Were organic system performance criteria met?	**NA**	Yes	**NA**	No	DA	Initials

Comments: Not applicable for this level of limited validation, or for the methods reported.

19. Were internal standards within method criteria for ICP-MS sample analyses?	**NA**	Yes	**NA**	No	DA	Initials

Comments: Not evaluated for this level of limited data validation.

20. Were system performance criteria met?	**NA**	Yes	**NA**	No	DA	Initials

Comments: Not evaluated for this level of limited validation.

21. Were field duplicates collected? If so, discuss the precision (RPD and/or RER) of the results.	**X**	Yes		No	DA	Initials

Duplicate Sample	Dup-01	Primary Sample	MW-38B

Comments: The duplicate sample pair met the acceptance criteria. The following criteria was used to evaluate the field duplicate results:

- For results where both reported values were greater than five times the reporting limit (RL), the relative percent difference (RPD) between the results were ≤30%.
- For results where either value reported was less than five times the RL, the absolute difference between the results was compared to a criterion of agreement within ±2xRL.
- The replicate error ratio (RER) for radiochemical parameters was ≤2.

22. Were qualitative criteria for organic target analyte identification met?	**NA**	Yes	**NA**	No	DA	Initials

Comments: Not applicable for this level of limited data validation or for the methods reported.

VALIDATION CRITERIA CHECK						
23. Were 10% of the EDD concentrations and reporting limits compared to the hardcopy data reports?	**X**	Yes		No	DA	Initials
Comments: During the validation procedure, 10% of the positive sample concentrations and RLs for project samples were compared to hardcopy laboratory reports.						

Table of Qualified Analytical Results
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Sample Identification	Laboratory Identification	Analytical Method	Analyte	Flag	Reason Code
280-197290-2	DUP-01-09272024	280-197290-20	SW6020B	Arsenic	J	lq
280-197290-2	DUP-01-09272024	280-197290-20	SW6020B	Cobalt	J	lq
280-197290-2	DUP-01-09272024	280-197290-20	SW6020B	Selenium	J	lq
280-197290-2	EB-09272024	280-197290-22	SW6010D	Calcium	J	lq
280-197290-2	EB-09272024	280-197290-22	SW6020B	Barium	J	lq
280-197290-2	MW-14B-09252024	280-197290-1	SW6020B	Arsenic	J	lq
280-197290-2	MW-14B-09252024	280-197290-1	SW6020B	Lead	J	lq
280-197290-2	MW-20B-09252024	280-197290-2	SW6020B	Arsenic	J	lq
280-197290-2	MW-20B-09252024	280-197290-2	SW6020B	Chromium	J	lq
280-197290-2	MW-20B-09252024	280-197290-2	SW6020B	Selenium	J	lq
280-197290-2	MW-21B-09272024	280-197290-18	SW6020B	Lead	J	lq
280-197290-2	MW-32B-09262024	280-197290-7	SW6020B	Arsenic	J	lq
280-197290-2	MW-32B-09262024	280-197290-7	SW6020B	Chromium	J	lq
280-197290-2	MW-32B-09262024	280-197290-7	SW6020B	Selenium	J	lq
280-197290-2	MW-36B-09272024	280-197290-17	SW6020B	Arsenic	J	lq
280-197290-2	MW-36B-09272024	280-197290-17	SW6020B	Chromium	J	lq
280-197290-2	MW-37B-09252024	280-197290-3	SW6020B	Arsenic	J	lq
280-197290-2	MW-37B-09252024	280-197290-3	SW6020B	Chromium	J	lq
280-197290-2	MW-38B-09272024	280-197290-19	SW6020B	Arsenic	J	lq
280-197290-2	MW-38B-09272024	280-197290-19	SW6020B	Cobalt	J	lq
280-197290-2	MW-38B-09272024	280-197290-19	SW6020B	Selenium	J	lq
280-197290-2	MW-38C-09272024	280-197290-21	SW6010D	Boron	J	lq
280-197290-2	MW-38C-09272024	280-197290-21	SW6020B	Arsenic	J	lq
280-197290-2	MW-38C-09272024	280-197290-21	SW6020B	Chromium	J	lq
280-197290-2	MW-39B-09262024	280-197290-8	SW6020B	Arsenic	J	lq
280-197290-2	MW-39B-09262024	280-197290-8	SW6020B	Chromium	J	lq
280-197290-2	MW-39B-09262024	280-197290-8	SW6020B	Selenium	J	lq
280-197290-2	MW-40B-09262024	280-197290-9	SW6020B	Chromium	J	lq
280-197290-2	MW-41B-09262024	280-197290-10	SW6020B	Arsenic	J	lq
280-197290-2	MW-41B-09262024	280-197290-10	SW6020B	Cobalt	J	lq
280-197290-2	MW-42B-09262024	280-197290-14	SW6020B	Arsenic	J	lq
280-197290-2	MW-42B-09262024	280-197290-14	SW6020B	Chromium	J	lq
280-197290-2	MW-43B-09262024	280-197290-15	SW6020B	Arsenic	J	lq
280-197290-2	MW-43B-09262024	280-197290-15	SW6020B	Chromium	J	lq
280-197290-2	MW-43B-09262024	280-197290-15	SW6020B	Selenium	J	lq
280-197290-2	MW-44B-09262024	280-197290-13	SW6020B	Arsenic	J	lq
280-197290-2	MW-45B-09262024	280-197290-12	SW6020B	Arsenic	J	lq
280-197290-2	MW-45B-09262024	280-197290-12	SW6020B	Chromium	J	lq
280-197290-2	MW-46B-09272024	280-197290-16	SW6010D	Boron	J	lq
280-197290-2	MW-46B-09272024	280-197290-16	SW6020B	Arsenic	J	lq
280-197290-2	MW-46B-09272024	280-197290-16	SW6020B	Selenium	J	lq
280-197290-2	MW-47B-09262024	280-197290-11	SW6020B	Arsenic	J	lq
280-197290-2	MW-47B-09262024	280-197290-11	SW6020B	Selenium	J	lq
280-197290-2	MW-47B-09262024	280-197290-11	SW9056A	Fluoride	J	lq
280-197290-2	MW-49B-09252024	280-197290-4	SW6020B	Arsenic	J	lq
280-197290-2	MW-49B-09252024	280-197290-4	SW6020B	Chromium	J	lq
280-197290-2	MW-52B-09262024	280-197290-6	SW6020B	Antimony	J	lq
280-197290-2	MW-52B-09262024	280-197290-6	SW6020B	Arsenic	J	lq
280-197290-2	MW-52B-09262024	280-197290-6	SW6020B	Lead	J	lq
280-197290-2	MW-52B-09262024	280-197290-6	SW6020B	Selenium	J	lq
280-197290-2	MW-52B-09262024	280-197290-6	SW9056A	Fluoride	J	lq
280-197290-2	MW-53BR-09262024	280-197290-5	SW6020B	Arsenic	J	lq
280-197290-2	MW-53BR-09262024	280-197290-5	SW6020B	Lead	J	lq
280-197290-2	MW-21B-09272024	280-197290-18	SW6020B	Arsenic	J-	m,lq
280-197290-2	MW-21B-09272024	280-197290-18	SW6020B	Selenium	J-	m
280-197290-2	MW-21B-09272024	280-197290-18	SW6020B	Thallium	UJ	m
280-197290-2	MW-21B-09272024	280-197290-18	SW9056A	Fluoride	J-	m
280-197290-1	DUP-01-09272024	280-197290-20	SW9320	Radium-228	J+	bl
280-197290-1	MW-32B-09262024	280-197290-7	SW9320	Radium-228	J+	bl
280-197290-1	MW-37B-09252024	280-197290-3	SW9320	Radium-228	J+	bl
280-197290-1	MW-40B-09262024	280-197290-9	SW9320	Radium-228	J+	bl
280-197290-1	MW-43B-09262024	280-197290-15	SW9320	Radium-228	J+	bl
280-197290-1	MW-45B-09262024	280-197290-12	SW9320	Radium-228	J+	bl
280-197290-1	MW-52B-09262024	280-197290-6	SW9320	Radium-228	J+	bl
280-197290-1	MW-20B-09252024	280-197290-2	RA226RA228	Combined Radium 226 + 228	J	v
280-197290-1	MW-20B-09252024	280-197290-2	SW9320	Radium-228	J	v

Table of Qualified Analytical Results
Basin Electric – Laramie, Wyoming
First Semi-Annual Groundwater 2024

Data Package	Sample Identification	Laboratory Identification	Analytical Method	Analyte	Flag	Reason Code
280-197290-1	MW-38B-09272024	280-197290-19	SW9320	Radium-228	J	v
280-197290-1	MW-38C-09272024	280-197290-21	SW9320	Radium-228	J	v
280-197290-1	MW-41B-09262024	280-197290-10	RA226RA228	Combined Radium 226 + 228	J	v
280-197290-1	MW-41B-09262024	280-197290-10	SW9320	Radium-228	J	v
280-197290-1	MW-49B-09252024	280-197290-4	RA226RA228	Combined Radium 226 + 228	J	v

Flag Definitions

J – The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J- - The result is an estimated quantity, but the result may be biased low.
J+ - The result is an estimated quantity, but the result may be biased high.
UJ – The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Reason Code Definitions

lq – Trace Value
m – Matrix Spike Recovery Outliers
bl - Laboratory blank contamination
v - Compound Identification Issue

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Attachment B

Input and Output Data Files for Calculation of Upper and Lower Prediction Limits (2016-2021)

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Pond 1 Unit

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte (Abbreviation)		B	D_B	Ca	D_Ca	Cl	D_Cl	F	D_F	pH	D_pH	SO	D_SO	TDS	D_TDS	Sb	D_Sb	As	D_As	Ba	D_Ba
MW-52B	7/19/2017	0.15	1	120	1	33	1	0.5	1	7.91	1	370	1	820	1	0.002	0	0.005	0	0.13	1
MW-52B	8/25/2017	0.16	1	120	1	41	1	0.5	0	7.54	1	410	1	920	1	0.002	0	0.005	0	0.12	1
MW-52B	8/31/2017	0.16	1	160	1	41	1	0.5	0	7.61	1	420	1	930	1	0.002	0	0.005	0	0.24	1
MW-52B	9/6/2017	0.17	1	140	1	41	1	0.5	0	7.61	1	430	1	980	1	0.002	0	0.005	0	0.11	1
MW-52B	9/14/2017	0.16	1	130	1	43	1	0.5	0	7.46	1	430	1	940	1	0.002	0	0.005	0	0.12	1
MW-52B	9/18/2017	0.15	1	130	1	41	1	0.5	0	7.45	1	420	1	1000	1	0.002	0	0.005	0	0.11	1
MW-52B	9/27/2017	0.15	1	140	1	40	1	0.5	0	7.55	1	430	1	960	1	0.002	0	0.005	0	0.11	1
MW-52B	10/3/2017	0.15	1	130	1	42	1	0.5	0	7.74	1	430	1	1000	1	0.002	0	0.005	0	0.096	1
MW-52B	4/4/2018							0.5	0											0.109	1
MW-52B	6/27/2018	0.16	1	175	1	39.4	1	0.5	0	7.39	1	499	1	1080	1	0.002	0	0.005	0	0.0861	1
MW-52B	10/24/2018	0.159	1	168	1	41.1	1	0.5	0			469	1	1100	1	0.002	0	0.005	0	0.0819	1
MW-52B	6/5/2019	0.152	1	169	1	42.8	1	0.5	0	6.94	1	493	1	1120	1					0.075	1
MW-52B	10/22/2019	0.154	1	174	1	39.3	1	0.5	0	7.55	1	471	1	1040	1	0.002	0	0.005	0	0.0752	1
MW-52B	6/3/2020	0.149	1	167	1	34.8	1	0.5	0	7.53	1	450	1	1890	1	0.002	0	0.005	0	0.0715	1
MW-52B	10/7/2020	0.187	1	161	1	40.7	1	0.5	0	7.58	1	923	1	1140	1	0.002	0	0.005	0	0.0514	1
MW-52B	6/4/2021	0.174	1	158	1	47.7	1	0.5	0	7.66	1	455	1	1130	1	0.002	0	0.005	0	0.0653	1
MW-52B	10/7/2021	0.166	1	159	1	49.1	1	0.5	0	7.52	1	480	1	1090	1	0.002	0	0.005	0	0.0512	1
MW-53B	7/19/2017	0.1	0	95	1	32	1	0.96	1	8.63	1	220	1	570	1	0.002	0	0.005	0	0.1	1
MW-53B	8/25/2017	0.1	0	81	1	34	1	0.91	1	8.48	1	210	1	560	1	0.002	0	0.005	0	0.12	1
MW-53B	8/31/2017	0.1	0	82	1	33	1	0.88	1	8.72	1	220	1	540	1	0.002	0	0.005	0	0.13	1
MW-53B	9/6/2017	0.1	0	79	1	33	1	1	1	8.98	1	210	1	560	1	0.002	0	0.005	0	0.13	1
MW-53B	9/14/2017	0.1	0	77	1	33	1	0.93	1	7.79	1	220	1	590	1	0.002	0	0.005	0	0.094	1
MW-53B	9/18/2017	0.1	0	76	1	33	1	1	1	7.52	1	210	1	580	1	0.002	0	0.005	0	0.094	1
MW-53B	9/27/2017	0.1	0	78	1	32	1	1.1	1	7.96	1	220	1	620	1	0.002	0	0.005	0	0.07	1
MW-53B	10/3/2017	0.1	0	78	1	33	1	1.1	1	7.79	1	220	1	610	1	0.002	0	0.005	0	0.081	1
MW-53B	4/4/2017							1.14	1							0.002	0	0.005	0	0.0546	1
MW-53B	6/27/2018	0.104	1	102	1	36.6	1	1.33	1	7.62	1	242	1	691	1	0.002	0	0.005	0	0.0522	1
MW-53B	10/24/2018	0.106	1	97.8	1	40.5	1	1.21	1			231	1	711	1					0.0531	1
MW-53B	6/5/2019	0.1	0	104	1	45.7	1	1.08	1	7.2	1	247	1	699	1					0.0451	1
MW-53B	10/22/2019	0.1	0	102	1	47	1	0.919	1	7.81	1	222	1	686	1	0.002	0	0.005	0	0.0477	1
MW-53B	6/3/2020	0.1	0	101	1	41.2	1	0.939	1	7.76	1	220	1	697	1	0.002	0	0.005	0	0.0504	1
MW-53B	10/7/2020	0.117	1	102	1	42.1	1	0.958	1	7.74	1	238	1	709	1	0.002	0	0.005	0	0.0427	1
MW-53B	6/4/2021	0.113	1	99.7	1	51.1	1	1.02	1	7.93	1	220	1	698	1	0.002	0	0.005	0	0.0427	1
MW-53B	10/6/2021	0.115	1	103	1	52.7	1	0.948	1	7.78	1	208	1	683	1	0.002	0	0.005	0	0.0527	1

Notes:
results in mg/L

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Pond 1 Unit

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte (Abbreviation)		Be	D_Be	Cd	D_Cd	Cr	D_Cr	Co	D_Co	Pb	D_Pb	Li	D_Li	Hg	D_Hg	Mo	D_Mo	Ra	D_Ra	Se	D_Se	Th	D_Th
MW-52B	7/19/2017	0.001	0	0.001	0	0.0058	1	0.0014	1	0.001	0	0.048	1	0.0002	0	0.013	1	0.347	0	0.005	0	0.001	0
MW-52B	8/25/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.039	1	0.0002	0	0.0094	1	0.903	1	0.005	0	0.001	0
MW-52B	8/31/2017	0.001	0	0.001	0	0.011	1	0.004	1	0.0041	1	0.063	1	0.0002	0	0.0088	1	1.25	0	0.005	0	0.001	0
MW-52B	9/6/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.045	1	0.0002	0	0.0083	1	1.2	0	0.005	0	0.001	0
MW-52B	9/14/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.049	1	0.0002	0	0.0071	1	0.482	1	0.005	0	0.001	0
MW-52B	9/18/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.049	1	0.0002	0	0.0066	1	0.566	1	0.005	0	0.001	0
MW-52B	9/27/2017	0.001	0	0.001	0	0.002	0	0.001	1	0.001	0	0.05	1	0.0002	0	0.0063	1	0.37	0	0.005	0	0.001	0
MW-52B	10/3/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.048	1	0.0002	0	0.0056	1	0.576	0	0.005	0	0.001	0
MW-52B	4/4/2018	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0475	1	0.0002	0	0.00531	1	0.617	1	0.005	0	0.001	0
MW-52B	6/27/2018	0.001	0	0.001	0	0.002	0			0.001	0	0.0476	1	0.0002	0	0.00452	1	0.873	0	0.005	0	0.001	0
MW-52B	10/24/2018					0.002	0	0.001	0			0.0393	1			0.00407	1			0.005	0		
MW-52B	6/5/2019					0.002	0	0.001	0			0.0467	1			0.00417	1			0.005	0		
MW-52B	10/22/2019	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0403	1	0.0002	0	0.00418	1	0.775	1	0.005	0	0.001	0
MW-52B	6/3/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0426	1	0.0002	0	0.01	0	0.669	1	0.005	0	0.001	0
MW-52B	10/7/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0406	0	0.0002	0	0.01	0	0.626	1	0.005	0	0.001	0
MW-52B	6/4/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0456	1	0.0002	0	0.01	0	1.02	0	0.005	0	0.001	0
MW-52B	10/7/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0385	1	0.0002	0	0.01	0	0.934	0	0.005	0	0.001	0
MW-53B	7/19/2017	0.001	0	0.001	0	0.0045	1	0.001	0	0.001	0	0.042	1	0.0002	0	0.014	1	0.682	0	0.006	1	0.001	0
MW-53B	8/25/2017	0.001	0	0.001	0	0.0038	1	0.001	0	0.001	0	0.033	1	0.0002	0	0.014	1	1.09	1	0.005	0	0.001	0
MW-53B	8/31/2017	0.001	0	0.001	0	0.0045	1	0.001	0	0.001	0	0.042	1	0.0002	0	0.015	1	0.426	0	0.005	0	0.001	0
MW-53B	9/6/2017	0.001	0	0.001	0	0.0052	1	0.001	0	0.001	0	0.035	1	0.0002	0	0.015	1	0.407	0	0.005	0	0.001	0
MW-53B	9/14/2017	0.001	0	0.001	0	0.0028	1	0.001	0	0.001	0	0.038	1	0.0002	0	0.012	1	0.424	0	0.005	0	0.001	0
MW-53B	9/18/2017	0.001	0	0.001	0	0.0033	1	0.001	0	0.001	0	0.041	1	0.0002	0	0.012	1	0.432	0	0.005	0	0.001	0
MW-53B	9/27/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.042	1	0.0002	0	0.01	1	0.375	0	0.005	0	0.001	0
MW-53B	10/3/2017	0.001	0	0.001	0	0.0022	1	0.001	0	0.001	0	0.04	1	0.0002	0	0.011	1	1.88	0	0.005	0	0.001	0
MW-53B	4/4/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0418	1	0.0002	0	0.00696	1	0.37	0	0.00689	1	0.001	0
MW-53B	6/27/2018	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0384	1	0.0002	0	0.00851	1	0.4	0	0.00636	1	0.001	0
MW-53B	10/24/2018					0.002	0	0.001	0	0.001	0	0.0412	1			0.00669	1			0.00708	1		
MW-53B	6/5/2019					0.002	0					0.0375	1			0.00563	1			0.00854	1		
MW-53B	10/22/2019	0.001	0	0.001	0	0.002	0	0.001	0			0.0317	1	0.0002	0	0.00606	1	0.595	0	0.00935	1	0.001	0
MW-53B	6/3/2020	0.001	0	0.001	0	0.0024	1	0.001	0	0.001	0	0.0378	1	0.0002	0	0.01	0	0.505	0	0.00951	1	0.001	0
MW-53B	10/7/2020	0.001	0	0.001	0	0.0027	1	0.001	0	0.001	0	0.0331	0	0.0002	0	0.01	0	0.632	0	0.0106	1	0.001	0
MW-53B	6/4/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0341	1	0.0002	0	0.01	0	0.767	1	0.0103	1	0.001	0
MW-53B	10/6/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.035	1	0.0002	0	0.01	0	0.749	0	0.0106	1	0.001	0

Notes:
results in mg/L

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Pond2,3 Multi-unit

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte(Abbreviation)		B	D_B	Ca	D_Ca	Cl	D_Cl	F	D_F	pH	D_pH	SO	D_SO	TDS	D_TDS	Sb	D_Sb	As	D_As	Ba	D_Ba
MW-32B	9/1/2016	0.27	1	200	1	83	1	0.54	1	7.21	1	820	1	1700	1	0.002	0	0.005	0	0.077	1
MW-32B	11/11/2016	0.28	1	210	1	83	1	0.6	1	6.37	1	820	1	1700	1	0.002	0	0.005	0	0.057	1
MW-32B	12/15/2016	0.27	1	190	1	84	1	0.59	1	7.5	1	830	1	1700	1	0.002	0	0.005	0	0.053	1
MW-32B	2/13/2017	0.28	1	200	1	84	1	0.63	1	7.6	1	830	1	1700	1	0.002	0	0.005	0	0.047	1
MW-32B	4/4/2017	0.31	1	190	1	83	1	0.59	1	7.19	1	830	1	1700	1	0.02	0	0.05	0	0.038	1
MW-32B	5/16/2017	0.29	1	180	1	84	1	0.6	1	7.23	1	830	1	1700	1	0.002	0	0.005	0	0.04	1
MW-32B	6/13/2017	0.28	1	190	1	84	1	0.64	1	7.29	1	840	1	1800	1	0.002	0	0.005	0	0.041	1
MW-32B	7/26/2017	0.26	1	190	1	86	1	0.53	1	7.28	1	790	1	1700	1	0.002	0	0.005	0	0.044	1
MW-32B	4/3/2018							0.639	1	7.37	1					0.002	0	0.005	0	0.0387	1
MW-32B	6/27/2018	0.294	1	189	1	85.6	1	0.657	1	7.35	1	845	1	1780	1	0.002	0	0.005	0	0.0371	1
MW-32B	6/5/2019	0.293	1	202	1	94.3	1	0.5	0	6.61	1	877	1	1830	1					0.0349	1
MW-32B	10/23/2019	0.295	1	198	1	89.5	1	0.5	0	7.36	1	840	1	1780	1	0.002	0	0.005	0	0.0323	1
MW-32B	6/2/2020	0.305	1	203	1	85.2	1	0.5	0	7.37	1	820	1	1820	1	0.002	0	0.005	0	0.0351	1
MW-32B	10/7/2020	0.306	1	191	1	83.8	1	0.5	0	7.25	1	833	1	1810	1	0.002	0	0.005	0	0.0309	1
MW-32B	6/2/2021	0.313	1	201	1	97.1	1	0.5	0	7.24	1	832	1	1830	1	0.002	0	0.005	0	0.0332	1
MW-32B	10/6/2021	0.296	1	196	1	94.3	1	0.604	1	7.25	1	839	1	1840	1	0.002	0	0.005	0	0.0333	1
MW-39B	9/2/2016	0.17	1	170	1	43	1	0.79	1	7.31	1	450	1	400	1	0.002	0	0.0057	1	0.11	1
MW-39B	11/10/2016	0.19	1	190	1	45	1	0.65	1	7.11	1	530	1	970	1	0.002	0	0.005	0	0.073	1
MW-39B	12/14/2016	0.18	1	180	1	46	1	0.63	1	7.5	1	540	1	1300	1	0.002	0	0.005	0	0.064	1
MW-39B	2/13/2017	0.19	1	200	1	46	1	0.66	1	7.7	1	540	1	1200	1	0.002	0	0.005	0	0.069	1
MW-39B	4/4/2017	0.2	1	180	1	46	1	0.61	1	7.02	1	550	1	1300	1	0.02	0	0.05	0	0.048	1
MW-39B	5/16/2017	0.21	1	170	1	46	1	0.66	1	7.13	1	540	1	1300	1	0.002	0	0.005	0	0.051	1
MW-39B	6/13/2017	0.18	1	170	1	46	1	0.66	1	7.17	1	550	1	1300	1	0.002	0	0.005	0	0.046	1
MW-39B	7/26/2017	0.18	1	180	1	47	1	0.64	1	7.18	1	540	1	1300	1	0.002	0	0.005	0	0.05	1
MW-39B	4/3/2018							0.641	1	7.33	1					0.002	0	0.005	0	0.0472	1
MW-39B	6/27/2018	0.192	1	181	1	46.4	1	0.686	1	7.38	1	582	1	1350	1	0.002	0	0.005	0	0.0404	1
MW-39B	6/5/2019	0.189	1	197	1	49.9	1	0.5	0	6.71	1	602	1	1340	1					0.0402	1
MW-39B	10/23/2019	0.183	1	191	1	45.8	1	0.5	0	7.26	1	542	1	1310	1	0.002	0	0.005	0	0.038	1
MW-39B	6/3/2020	0.185	1	195	1	40.7	1	0.5	0	7.12	1	537	1	1360	1	0.002	0	0.005	0	0.0356	1
MW-39B	10/7/2020	0.192	1	183	1	40.8	1	0.5	0	7.2	1	556	1	1340	1	0.002	0	0.005	0	0.0321	1
MW-39B	6/2/2021	0.189	1	202	1	47.8	1	0.5	0	7.16	1	562	1	1300	1	0.002	0	0.005	0	0.0332	1
MW-39B	10/6/2021	0.173	1	181	1	47	1	1.19	1	7.22	1	659	1	1310	1	0.002	0	0.005	0	0.0342	1

Notes:
results in mg/L

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Pond2,3 Multi-unit

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte(Abbreviation)		Be	D_Be	Cd	D_Cd	Cr	D_Cr	Co	D_Co	Pb	D_Pb	Li	D_Li	Hg	D_Hg	Mo	D_Mo	Ra	D_Ra	Se	D_Se	Th	D_Th
MW-32B	9/1/2016	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.074	1	0.0002	0	0.018	1	1.2	1	0.005	0	0.001	0
MW-32B	11/11/2016	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.08	1	0.0002	0	0.0076	1	0.716	1	0.005	0	0.001	0
MW-32B	12/15/2016	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.073	1	0.0002	0	0.0064	1	0.471	1	0.005	0	0.001	0
MW-32B	2/13/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.075	1	0.0002	0	0.0061	1	0.713	1	0.005	0	0.001	0
MW-32B	4/4/2017	0.01	0	0.01	0	0.02	0	0.01	0	0.01	0	0.081	1	0.0002	0	0.02	0	0.375	1	0.05	0	0.01	0
MW-32B	5/16/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.069	1	0.0002	0	0.0085	1	0.752	1	0.005	0	0.001	0
MW-32B	6/13/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.081	1	0.0002	0	0.0079	1	0.793	1	0.005	0	0.001	0
MW-32B	7/26/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.072	1	0.0002	0	0.0095	1	0.915	0	0.005	0	0.001	0
MW-32B	4/3/2018	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0804	1	0.0002	0	0.00502	1	0.983	1	0.005	0	0.001	0
MW-32B	6/27/2018	0.001	0	0.001	0	0.002	0			0.001	0	0.0769	1	0.0002	0	0.00568	1	0.687	0	0.005	0	0.001	0
MW-32B	6/5/2019					0.002	0					0.0837	1			0.00358	1	0.58	0	0.005	0		
MW-32B	10/23/2019	0.001	0	0.001	0	0.00245	1	0.001	0	0.001	0	0.0739	1	0.0002	0	0.00389	1	0.414	0	0.005	0	0.001	0
MW-32B	6/2/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0734	1	0.0002	0	0.01	0	0.48	0	0.005	0	0.001	0
MW-32B	10/7/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0648	0	0.0002	0	0.01	0	0.726	1	0.005	0	0.001	0
MW-32B	6/2/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0743	1	0.0002	0	0.01	0	0.69	1	0.005	0	0.001	0
MW-32B	10/6/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0714	1	0.0002	0	0.01	0	1.76	1	0.005	0	0.001	0
MW-39B	9/2/2016	0.001	0	0.001	0	0.002	0	0.0028	1	0.001	0	0.073	1	0.0002	0	0.069	1	0.823	1	0.005	0	0.001	0
MW-39B	11/10/2016	0.001	0	0.001	0	0.002	0	0.0015	1	0.001	0	0.069	1	0.0002	0	0.039	1	0.926	1	0.005	0	0.001	0
MW-39B	12/14/2016	0.001	0	0.001	0	0.002	0	0.0012	1	0.001	0	0.066	1	0.0002	0	0.028	1	0.797	1	0.005	0	0.001	0
MW-39B	2/13/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.068	1	0.0002	0	0.02	1	0.609	1	0.005	0	0.001	0
MW-39B	4/4/2017	0.01	0	0.01	0	0.02	0	0.01	0	0.01	0	0.069	1	0.0002	0	0.02	0	0.556	1	0.05	0	0.01	0
MW-39B	5/16/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.062	1	0.0002	0	0.017	1	0.373	0	0.005	0	0.001	0
MW-39B	6/13/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.064	1	0.0002	0	0.016	1	0.671	1	0.005	0	0.001	0
MW-39B	7/26/2017	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.063	1	0.0002	0	0.017	1	0.426	0	0.005	0	0.001	0
MW-39B	4/3/2018	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0661	1	0.0002	0	0.0134	1	0.758	1	0.005	0	0.001	0
MW-39B	6/27/2018	0.001	0	0.001	0	0.002	0			0.001	0	0.0608	1	0.0002	0	0.0134	1	0.806	0	0.005	0	0.001	0
MW-39B	6/5/2019					0.002	0					0.0704	1			0.00966	1	0.508	0	0.005	0		
MW-39B	10/23/2019	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0565	1	0.0002	0	0.00683	1	0.452	1	0.005	0	0.001	0
MW-39B	6/3/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0588	1	0.0002	0	0.01	0	0.552	1	0.005	0	0.001	0
MW-39B	10/7/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0555	0	0.0002	0	0.01	0	0.874	1	0.005	0	0.001	0
MW-39B	6/2/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0579	1	0.0002	0	0.01	0	0.725	1	0.005	0	0.001	0
MW-39B	10/6/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0529	1	0.0002	0	0.01	0	0.762	1	0.005	0	0.001	0

Notes:
results in mg/L

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Emergency Holding Ponds

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte(abbreviation)		B	D_B	Ca	D_Ca	Cl	D_Cl	F	D_F	pH	D_pH	SO	D_SO	TDS	D_TDS	Sb	D_Sb	As	D_As	Ba	D_Ba
MW-41B	8/31/2016	0.61	1	240	1	160	1	0.5	0	7.41	1	1300	1	2300	1	0.002	0	0.005	0	0.069	1
MW-41B	11/11/2016	0.68	1	270	1	170	1	0.5	0	6.45	1	1800	1	2400	1	0.002	0	0.005	0	0.05	1
MW-41B	12/15/2016	0.66	1	260	1	180	1	0.5	0	7.6	1	1500	1	2500	1	0.002	0	0.005	0	0.045	1
MW-41B	2/14/2017	0.64	1	280	1	180	1	0.5	0	7.7	1	1500	1	2600	1	0.002	0	0.005	0	0.046	1
MW-41B	4/3/2017	0.7	1	270	1	180	1	0.5	0	7.8	1	5	0	2700	1	0.02	0	0.05	0	0.036	1
MW-41B	5/16/2017	0.66	1	270	1	190	1	0.5	0	7.53	1	1600	1	2800	1	0.002	0	0.005	0	0.037	1
MW-41B	6/13/2017	0.6	1	270	1	190	1	0.5	0	7.43	1	1600	1	2800	1	0.002	0	0.005	0	0.032	1
MW-41B	7/26/2017	0.64	1	280	1	200	1	0.5	0	7.9	1	1500	1	2700	1	0.002	0	0.005	0	0.034	1
MW-41B	6/26/2018	0.703	1	351	1	225	1	0.5	0	7.48	1	1660	1	3050	1	0.002	0	0.005	0	0.0334	1
MW-41B	6/4/2019	0.714	1	396	1	277	1	0.5	0	7.47	1	2030	1	3400	1	0.002	0	0.005	0	0.0351	1
MW-41B	10/21/2019	0.862	1	333	1	200	1	1	0	7.56	1	1480	1	2800	1	0.002	0	0.005	0	0.032	1
MW-41B	6/2/2020	0.972	1	284	1	172	1	0.5	0	7.44	1	1300	1	2590	1	0.002	0	0.005	0	0.0273	1
MW-41B	10/6/2020	1.02	1	257	1	155	1	0.5	0	7.35	1	1160	1	2230	1	0.002	0	0.005	0	0.0254	1
MW-41B	6/3/2021	0.857	1	244	1	135	1	0.5	0	7.58	1	1060	1	2020	1	0.002	0	0.005	0	0.0207	1
MW-41B	10/5/2021	0.902	1	195	1	120	1	0.5	0	7.59	1	985	1	1950	1	0.002	0	0.005	0	0.02	1
MW-42B	8/31/2016	0.94	1	530	1	320	1	0.763	1	7.56	1	2200	1	3800	1	0.002	0	0.005	0	0.0193	1
MW-42B	11/11/2016	0.92	1	330	1	230	1	0.5	0	7.6	1	1700	1	2800	1	0.002	0	0.005	0	0.061	1
MW-42B	12/14/2016	0.89	1	320	1	210	1	0.68	1	7.6	1	1600	1	2700	1	0.002	0	0.005	0	0.047	1
MW-42B	2/15/2017	0.91	1	340	1	220	1	0.69	1	7.4	1	1600	1	2900	1	0.02	0	0.05	0	0.046	1
MW-42B	4/3/2017	0.94	1	450	1	320	1	0.7	1	6.52	1	5	0	3900	1	0.002	0	0.005	0	0.046	1
MW-42B	5/17/2017	0.87	1	430	1	320	1	0.5	0	7.6	1	2200	1	3900	1	0.002	0	0.005	0	0.03	1
MW-42B	6/13/2017	0.82	1	450	1	310	1	0.5	0	7.85	1	2200	1	4000	1	0.002	0	0.005	0	0.032	1
MW-42B	7/27/2017	1	1	410	1	300	1	0.5	0	7.8	1	1900	1	3400	1	0.002	0	0.005	0	0.03	1
MW-42B	6/26/2018	1.07	1	384	1	245	1	0.5	0	7.47	1	1760	1	3170	1	0.002	0	0.005	0	0.027	1
MW-42B	6/4/2019	0.897	1	413	1	297	1	0.739	1	7.47	1	2120	1	3470	1	0.002	0	0.005	0	0.0268	1
MW-42B	10/21/2019	0.89	1	332	1	203	1	0.532	1	7.9	1	1470	1	2700	1	0.002	0	0.005	0	0.0252	1
MW-42B	6/3/2020	0.733	1	173	1	133	1	1	0	7.47	1	980	1	1940	1	0.002	0	0.005	0	0.0316	1
MW-42B	10/7/2020	0.767	1	204	1	143	1	0.5	0	7.48	1	1030	1	2090	1	0.002	0	0.005	0	0.0219	1
MW-42B	6/3/2021	0.756	1	163	1	114	1	0.536	1	7.4	1	918	1	1770	1	0.002	0	0.005	0	0.0219	1
MW-42B	10/5/2021	0.621	1	193	1	173	1	0.5	0	7.37	1	1200	1	2260	1	0.002	0	0.005	0	0.0211	1
MW-43B	9/1/2016	0.33	1	180	1	69	1	0.545	1	7.39	1	660	1	1300	1	0.002	0	0.005	0	0.0189	1
MW-43B	11/11/2016	0.35	1	140	1	42	1	1.07	1	7.66	1	470	1	1000	1	0.002	0	0.005	0	0.0262	1
MW-43B	12/14/2016	0.34	1	120	1	40	1	0.5	0	7.68	1	450	1	970	1	0.02	0	0.05	0	0.056	1
MW-43B	2/15/2017	0.35	1	120	1	39	1	0.5	0	7.64	1	410	1	910	1	0.002	0	0.005	0	0.038	1
MW-43B	4/4/2017	0.35	1	100	1	42	1	0.5	0	7.88	1	400	1	890	1	0.002	0	0.005	0	0.034	1
MW-43B	5/17/2017	0.36	1	110	1	47	1	0.5	0	7.58	1	420	1	910	1	0.002	0	0.005	0	0.034	1
MW-43B	6/13/2017	0.32	1	100	1	48	1	0.5	0	7.19	1	420	1	930	1	0.002	0	0.005	0	0.033	1
MW-43B	7/26/2017	0.34	1	110	1	50	1	0.5	0	6.49	1	430	1	930	1	0.002	0	0.005	0	0.031	1
MW-43B	6/26/2018	0.366	1	118	1	47.2	1	0.5	0	7.7	1	423	1	996	1	0.002	0	0.005	0	0.029	1
MW-43B	6/4/2019	0.319	1	146	1	81.7	1	0.5	0	7.62	1	611	1	1170	1	0.002	0	0.005	0	0.03	1
MW-43B	10/21/2019	0.32	1	172	1	67.6	1	0.5	0	7.9	1	663	1	1290	1	0.002	0	0.005	0	0.0383	1
MW-43B	6/3/2020	0.316	1	149	1	52.9	1	0.5	0	7.37	1	550	1	1200	1	0.002	0	0.005	0	0.0309	1
MW-43B	10/7/2020	0.328	1	122	1	31.3	1	0.5	0	7.42	1	413	1	1000	1	0.002	0	0.005	0	0.039	1
MW-43B	6/3/2021	0.296	1	94.4	1	34	1	0.5	0	8	1	343	1	811	1	0.002	0	0.005	0	0.044	1
MW-43B	10/5/2021	0.305	1	92.2	1	36.3	1	0.587	1	7.5	1	342	1	798	1	0.002	0	0.005	0	0.0371	1

Notes:
results in mg/L

Attachment B: Input data for Calculation
of Upper and Lower Predictive Limits
CCR Monitoring Wells for Multi-units
Laramie River Station - Wheatland, WY

Emergency Holding Ponds

Well	date	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result	Result	D-Result
Analyte(abbreviation)		Be	D_Be	Cd	D_Cd	Cr	D_Cr	Co	D_Co	Pb	D_Pb	Li	D_Li	Hg	D_Hg	Mo	D_Mo	Ra	D_Ra	Se	D_Se	Th	D_Th
MW-41B	8/31/2016	0.001	0	0.001	0	0.002	0	0.0016	1	0.001	0	0.05	1	0.0002	0	0.037	1	1.02	1	0.0097	1	0.001	0
MW-41B	11/11/2016	0.001	0	0.001	0	0.0039	1	0.001	0	0.001	0	0.057	1	0.0002	0	0.048	1	0.807	1	0.005	0	0.001	0
MW-41B	12/15/2016	0.001	0	0.001	0	0.0042	1	0.001	0	0.001	0	0.053	1	0.0002	0	0.045	1	0.938	1	0.005	0	0.001	0
MW-41B	2/14/2017	0.001	0	0.001	0	0.0051	1	0.001	0	0.001	0	0.055	1	0.0002	0	0.055	1	0.358	0	0.01	1	0.001	0
MW-41B	4/3/2017	0.01	0	0.01	0	0.02	0	0.01	0	0.01	0	0.062	1	0.0002	0	0.053	1	0.408	1	0.005	0	0.01	0
MW-41B	5/16/2017	0.001	0	0.001	0	0.0048	1	0.001	0	0.001	0	0.054	1	0.0002	0	0.06	1	0.373	1	0.005	0	0.001	0
MW-41B	6/13/2017	0.001	0	0.001	0	0.0042	1	0.001	0	0.001	0	0.058	1	0.0002	0	0.056	1	0.538	1	0.011	1	0.001	0
MW-41B	7/26/2017	0.001	0	0.001	0	0.004	1	0.001	0	0.001	0	0.054	1	0.0002	0	0.054	1	0.609	0	0.005	0	0.001	0
MW-41B	6/26/2018	0.001	0	0.001	0	0.00336	1	0.001	0	0.001	0	0.0655	1	0.0002	0	0.0637	1	0.398	0	0.005	0	0.001	0
MW-41B	6/4/2019	0.001	0	0.001	0	0.00335	1	0.00114	1	0.001	0	0.0631	1	0.0002	0	0.0678	1	0.73	0	0.011	1	0.001	0
MW-41B	10/21/2019	0.001	0	0.001	0	0.00282	1	0.001	0	0.001	0	0.0731	1	0.0002	0	0.097	1	0.483	0	0.005	0	0.001	0
MW-41B	6/2/2020	0.001	0	0.001	0	0.00314	1	0.001	0	0.001	0	0.0601	1	0.0002	0	0.132	1	0.547	0	0.005	0	0.001	0
MW-41B	10/6/2020	0.001	0	0.001	0	0.00327	1	0.00118	1	0.001	0	0.0541	1	0.0002	0	0.14	1	0.486	0	0.05	0	0.001	0
MW-41B	6/3/2021	0.001	0	0.001	0	0.00389	1	0.001	0	0.001	0	0.0507	0	0.0002	0	0.135	1	0.53	1	0.05	0	0.001	0
MW-41B	10/5/2021	0.001	0	0.001	0	0.005	0	0.0012	1	0.001	0	0.0532	1	0.0002	0	0.139	1	0.563	1	0.05	0	0.001	0
MW-42B	8/31/2016	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0411	1	0.0002	0	0.118	1	0.535	1	0.012	1	0.001	0
MW-42B	11/11/2016	0.001	0	0.001	0	0.0024	1	0.001	0	0.001	0	0.085	1	0.0002	0	0.18	1	0.488	0	0.0065	1	0.001	0
MW-42B	12/14/2016	0.001	0	0.001	0	0.0029	1	0.001	0	0.001	0	0.066	1	0.0002	0	0.15	1	0.59	1	0.005	0	0.001	0
MW-42B	2/15/2017	0.01	0	0.01	0	0.0036	1	0.01	0	0.01	0	0.061	1	0.0002	0	0.13	1	0.509	0	0.011	1	0.01	0
MW-42B	4/3/2017	0.001	0	0.001	0	0.02	0	0.001	0	0.001	0	0.063	1	0.0002	0	0.15	1	0.477	1	0.005	0	0.001	0
MW-42B	5/17/2017	0.001	0	0.001	0	0.0027	1	0.001	0	0.001	0	0.083	1	0.0002	0	0.17	1	0.397	1	0.005	0	0.001	0
MW-42B	6/13/2017	0.001	0	0.001	0	0.0024	1	0.001	0	0.001	0	0.075	1	0.0002	0	0.18	1	0.609	1	0.011	1	0.001	0
MW-42B	7/27/2017	0.001	0	0.001	0	0.0025	1	0.001	0	0.001	0	0.081	1	0.0002	0	0.17	1	0.503	0	0.0055	1	0.001	0
MW-42B	6/26/2018	0.001	0	0.001	0	0.00319	1	0.001	0	0.001	0	0.071	1	0.0002	0	0.15	1	0.508	1	0.005	0	0.001	0
MW-42B	6/4/2019	0.001	0	0.001	0	0.00217	1	0.001	0	0.001	0	0.0684	1	0.0002	0	0.121	1	0.472	0	0.00886	1	0.001	0
MW-42B	10/21/2019	0.001	0	0.001	0	0.00272	1	0.001	0	0.001	0	0.0708	1	0.0002	0	0.143	1	0.413	0	0.0077	1	0.001	0
MW-42B	6/3/2020	0.001	0	0.001	0	0.00235	1	0.001	0	0.001	0	0.0765	1	0.0002	0	0.138	1	0.478	0	0.005	0	0.001	0
MW-42B	10/7/2020	0.001	0	0.001	0	0.0022	1	0.001	0	0.001	0	0.0561	1	0.0002	0	0.106	1	0.475	0	0.00832	1	0.001	0
MW-42B	6/3/2021	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0428	1	0.0002	0	0.0772	1	0.393	0	0.00714	1	0.001	0
MW-42B	10/5/2021	0.001	0	0.001	0	0.005	0	0.001	0	0.001	0	0.0437	0	0.0002	0	0.0706	1	0.855	0	0.005	0	0.001	0
MW-43B	9/1/2016	0.001	0	0.001	0	0.003	1	0.001	0	0.001	0	0.0431	1	0.0002	0	0.0662	1	0.525	1	0.00611	1	0.001	0
MW-43B	11/11/2016	0.001	0	0.001	0	0.008	1	0.001	1	0.001	0	0.0653	1	0.0002	0	0.0653	1	0.722	1	0.00699	1	0.001	0
MW-43B	12/14/2016	0.01	0	0.01	0	0.0089	1	0.01	0	0.01	0	0.041	1	0.0002	0	0.049	1	0.714	0	0.005	0	0.01	0
MW-43B	2/15/2017	0.001	0	0.001	0	0.0076	1	0.001	0	0.001	0	0.04	1	0.0002	0	0.048	1	0.46	0	0.00638	1	0.001	0
MW-43B	4/4/2017	0.001	0	0.001	0	0.02	0	0.001	0	0.001	0	0.038	1	0.0002	0	0.043	1	0.316	0	0.00998	1	0.001	0
MW-43B	5/17/2017	0.001	0	0.001	0	0.003	1	0.001	0	0.001	0	0.035	1	0.0002	0	0.039	1	0.315	0	0.005	0	0.001	0
MW-43B	6/13/2017	0.001	0	0.001	0	0.0024	1	0.001	0	0.001	0	0.035	1	0.0002	0	0.032	1	0.64	1	0.00562	1	0.001	0
MW-43B	7/26/2017	0.001	0	0.001	0	0.004	1	0.001	0	0.001	0	0.031	1	0.0002	0	0.034	1	0.384	0	0.0124	1	0.001	0
MW-43B	6/26/2018	0.001	0	0.001	0	0.00246	1	0.001	0	0.001	0	0.037	1	0.0002	0	0.031	1	0.393	0	0.005	0	0.001	0
MW-43B	6/4/2019	0.001	0	0.001	0	0.00218	1	0.001	0	0.001	0	0.033	1	0.0002	0	0.03	1	0.322	0	0.00608	1	0.001	0
MW-43B	10/21/2019	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0399	1	0.0002	0	0.0366	1	0.457	0	0.0119	1	0.001	0
MW-43B	6/3/2020	0.001	0	0.001	0	0.002	0	0.001	0	0.001	0	0.0305	1	0.0002	0	0.0346	1	0.971	1	0.005	0	0.001	0
MW-43B	10/7/2020	0.001	0	0.001	0	0.002	0					0.035	1			0.0196	1	0.474	0	0.00652	1	0.001	0
MW-43B	6/3/2021	0.001	0	0.001	0	0.00514	1					0.0328	1			0.0208	1	0.582	0	0.0161	1	0.001	0
MW-43B	10/5/2021	0.001	0	0.001	0	0.005	0					0.0353	1			0.0192	1	1.01	1	0.005	0		

Notes:
results in mg/L

1			Background Statistics for Data Sets with Non-Detects								
2	User Selected Options										
3	Date/Time of Computation		ProUCL 5.110/13/2022 9:04:32 AM								
4	From File		LRS_ProUCL_UPL_Input_2021_v1_b.xls								
5	Full Precision		OFF								
6	Confidence Coefficient		95%								
7	Coverage		95%								
8	)ifferent or Future K Observations		1								
9	Number of Bootstrap Operations		2000								
10											
11	B										
12											
13	General Statistics										
14				Total Number of Observations	45			Number of Distinct Observations	37		
15				Minimum	0.296			First Quartile	0.35		
16				Second Largest	1.02			Median	0.68		
17				Maximum	1.07			Third Quartile	0.89		
18				Mean	0.65			SD	0.253		
19				Coefficient of Variation	0.389			Skewness	-0.145		
20				Mean of logged Data	-0.519			SD of logged Data	0.442		
21											
22				Critical Values for Background Threshold Values (BTVs)							
23				Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915		
24											
25				Normal GOF Test							
26				Shapiro Wilk Test Statistic	0.874			Shapiro Wilk GOF Test			
27				5% Shapiro Wilk Critical Value	0.945			Data Not Normal at 5% Significance Level			
28				Lilliefors Test Statistic	0.202			Lilliefors GOF Test			
29				5% Lilliefors Critical Value	0.131			Data Not Normal at 5% Significance Level			
30				Data Not Normal at 5% Significance Level							
31											
32				Background Statistics Assuming Normal Distribution							
33			95% UTL with	95% Coverage	1.177			90% Percentile (z)	0.974		
34				95% UPL (t)	1.079			95% Percentile (z)	1.066		
35				95% USL	1.387			99% Percentile (z)	1.238		
36											
37				Gamma GOF Test							
38				A-D Test Statistic	2.511			Anderson-Darling Gamma GOF Test			
39				5% A-D Critical Value	0.752			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic	0.203			Kolmogorov-Smirnov Gamma GOF Test			
41				5% K-S Critical Value	0.132			Data Not Gamma Distributed at 5% Significance Level			
42				Data Not Gamma Distributed at 5% Significance Level							
43											
44				Gamma Statistics							
45				k hat (MLE)	5.864			k star (bias corrected MLE)	5.488		
46				Theta hat (MLE)	0.111			Theta star (bias corrected MLE)	0.118		
47				nu hat (MLE)	527.7			nu star (bias corrected)	493.9		
48				MLE Mean (bias corrected)	0.65			MLE Sd (bias corrected)	0.277		
49											
50				Background Statistics Assuming Gamma Distribution							
51			95% Wilson Hilferty (WH) Approx. Gamma UPL		1.174			90% Percentile	1.021		
52			95% Hawkins Wixley (HW) Approx. Gamma UPL		1.192			95% Percentile	1.163		
53			95% WH Approx. Gamma UTL with	95% Coverage	1.337			99% Percentile	1.461		

54				95% HW Approx. Gamma UTL with	95% Coverage	1.369					
55					95% WH USL	1.736				95% HW USL	1.814
56											
57					Lognormal GOF Test						
58					Shapiro Wilk Test Statistic	0.833	Shapiro Wilk Lognormal GOF Test				
59					5% Shapiro Wilk Critical Value	0.945	Data Not Lognormal at 5% Significance Level				
60					Lilliefors Test Statistic	0.198	Lilliefors Lognormal GOF Test				
61					5% Lilliefors Critical Value	0.131	Data Not Lognormal at 5% Significance Level				
62					Data Not Lognormal at 5% Significance Level						
63											
64					Background Statistics assuming Lognormal Distribution						
65				95% UTL with	95% Coverage	1.494				90% Percentile (z)	1.048
66					95% UPL (t)	1.26				95% Percentile (z)	1.23
67					95% USL	2.156				99% Percentile (z)	1.662
68											
69					Nonparametric Distribution Free Background Statistics						
70					Data do not follow a Discernible Distribution (0.05)						
71											
72					Nonparametric Upper Limits for Background Threshold Values						
73					Order of Statistic, r	44				95% UTL with 95% Coverage	1.02
74					Approx, f used to compute achieved CC	1.158				pproximate Actual Confidence Coefficient achieved by UTL	0.665
75										Approximate Sample Size needed to achieve specified CC	93
76				95% Percentile Bootstrap UTL with	95% Coverage	1.06				95% BCA Bootstrap UTL with 95% Coverage	1.05
77					95% UPL	1.014				90% Percentile	0.94
78					90% Chebyshev UPL	1.417				95% Percentile	0.994
79					95% Chebyshev UPL	1.765				99% Percentile	1.048
80					95% USL	1.07					
81											
82					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
83					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
84					and consists of observations collected from clean unimpacted locations.						
85					The use of USL tends to provide a balance between false positives and false negatives provided the data						
86					represents a background data set and when many onsite observations need to be compared with the BTV.						
87											
88	Ca										
89											
90	General Statistics										
91					Total Number of Observations	45				Number of Distinct Observations	37
92					Minimum	92.2				First Quartile	146
93					Second Largest	450				Median	257
94					Maximum	530				Third Quartile	332
95					Mean	248.8				SD	116.5
96					Coefficient of Variation	0.468				Skewness	0.439
97					Mean of logged Data	5.4				SD of logged Data	0.503
98											
99					Critical Values for Background Threshold Values (BTVs)						
100					Tolerance Factor K (For UTL)	2.085				d2max (for USL)	2.915
101											
102					Normal GOF Test						
103					Shapiro Wilk Test Statistic	0.935	Shapiro Wilk GOF Test				
104					5% Shapiro Wilk Critical Value	0.945	Data Not Normal at 5% Significance Level				
105					Lilliefors Test Statistic	0.1	Lilliefors GOF Test				
106					5% Lilliefors Critical Value	0.131	Data appear Normal at 5% Significance Level				

107	Data appear Approximate Normal at 5% Significance Level										
108											
109	Background Statistics Assuming Normal Distribution										
110				95% UTL with	95% Coverage	491.7			90% Percentile (z)	398.1	
111				95% UPL (t)		446.7			95% Percentile (z)	440.4	
112				95% USL		588.4			99% Percentile (z)	519.8	
113											
114	Gamma GOF Test										
115				A-D Test Statistic		0.662	Anderson-Darling Gamma GOF Test				
116				5% A-D Critical Value		0.753	Detected data appear Gamma Distributed at 5% Significance Level				
117				K-S Test Statistic		0.103	Kolmogorov-Smirnov Gamma GOF Test				
118				5% K-S Critical Value		0.132	Detected data appear Gamma Distributed at 5% Significance Level				
119	Detected data appear Gamma Distributed at 5% Significance Level										
120											
121	Gamma Statistics										
122				k hat (MLE)		4.448			k star (bias corrected MLE)	4.166	
123				Theta hat (MLE)		55.94			Theta star (bias corrected MLE)	59.72	
124				nu hat (MLE)		400.3			nu star (bias corrected)	374.9	
125				MLE Mean (bias corrected)		248.8			MLE Sd (bias corrected)	121.9	
126											
127	Background Statistics Assuming Gamma Distribution										
128				95% Wilson Hilferty (WH) Approx. Gamma UPL		482.3			90% Percentile	412.1	
129				95% Hawkins Wixley (HW) Approx. Gamma UPL		489.8			95% Percentile	477.1	
130				95% WH Approx. Gamma UTL with	95% Coverage	557.7			99% Percentile	615.6	
131				95% HW Approx. Gamma UTL with	95% Coverage	572					
132				95% WH USL		745.4			95% HW USL	783.1	
133											
134	Lognormal GOF Test										
135				Shapiro Wilk Test Statistic		0.935	Shapiro Wilk Lognormal GOF Test				
136				5% Shapiro Wilk Critical Value		0.945	Data Not Lognormal at 5% Significance Level				
137				Lilliefors Test Statistic		0.128	Lilliefors Lognormal GOF Test				
138				5% Lilliefors Critical Value		0.131	Data appear Lognormal at 5% Significance Level				
139	Data appear Approximate Lognormal at 5% Significance Level										
140											
141	Background Statistics assuming Lognormal Distribution										
142				95% UTL with	95% Coverage	631.4			90% Percentile (z)	421.6	
143				95% UPL (t)		520			95% Percentile (z)	506.1	
144				95% USL		958.4			99% Percentile (z)	712.8	
145											
146	Nonparametric Distribution Free Background Statistics										
147	Data appear Approximate Normal at 5% Significance Level										
148											
149	Nonparametric Upper Limits for Background Threshold Values										
150				Order of Statistic, r		44			95% UTL with	95% Coverage	450
151				Approx, f used to compute achieved CC		1.158			pproximate Actual Confidence Coefficient achieved by UTL		0.665
152									Approximate Sample Size needed to achieve specified CC		93
153				95% Percentile Bootstrap UTL with	95% Coverage	514			95% BCA Bootstrap UTL with	95% Coverage	514
154				95% UPL		450			90% Percentile	411.8	
155				90% Chebyshev UPL		602.1			95% Percentile	446	
156				95% Chebyshev UPL		762.2			99% Percentile	494.8	
157				95% USL		530					
158											
159	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										

160	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
161	and consists of observations collected from clean unimpacted locations.										
162	The use of USL tends to provide a balance between false positives and false negatives provided the data										
163	represents a background data set and when many onsite observations need to be compared with the BTV.										
164											
165	CI										
166											
167	General Statistics										
168					Total Number of Observations	45			Number of Distinct Observations	38	
169					Minimum	31.3			First Quartile	52.9	
170					Second Largest	320			Median	170	
171					Maximum	320			Third Quartile	210	
172					Mean	155.6			SD	92.44	
173					Coefficient of Variation	0.594			Skewness	0.228	
174					Mean of logged Data	4.815			SD of logged Data	0.75	
175											
176	Critical Values for Background Threshold Values (BTVs)										
177					Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915	
178											
179	Normal GOF Test										
180					Shapiro Wilk Test Statistic	0.907			Shapiro Wilk GOF Test		
181					5% Shapiro Wilk Critical Value	0.945			Data Not Normal at 5% Significance Level		
182					Lilliefors Test Statistic	0.137			Lilliefors GOF Test		
183					5% Lilliefors Critical Value	0.131			Data Not Normal at 5% Significance Level		
184	Data Not Normal at 5% Significance Level										
185											
186	Background Statistics Assuming Normal Distribution										
187					95% UTL with 95% Coverage	348.3			90% Percentile (z)	274	
188					95% UPL (t)	312.6			95% Percentile (z)	307.6	
189					95% USL	425			99% Percentile (z)	370.6	
190											
191	Gamma GOF Test										
192					A-D Test Statistic	1.506			Anderson-Darling Gamma GOF Test		
193					5% A-D Critical Value	0.759			Data Not Gamma Distributed at 5% Significance Level		
194					K-S Test Statistic	0.15			Kolmogorov-Smirnov Gamma GOF Test		
195					5% K-S Critical Value	0.133			Data Not Gamma Distributed at 5% Significance Level		
196	Data Not Gamma Distributed at 5% Significance Level										
197											
198	Gamma Statistics										
199					k hat (MLE)	2.308			k star (bias corrected MLE)	2.169	
200					Theta hat (MLE)	67.39			Theta star (bias corrected MLE)	71.71	
201					nu hat (MLE)	207.7			nu star (bias corrected)	195.2	
202					MLE Mean (bias corrected)	155.6			MLE Sd (bias corrected)	105.6	
203											
204	Background Statistics Assuming Gamma Distribution										
205					95% Wilson Hilferty (WH) Approx. Gamma UPL	365.9			90% Percentile	296.8	
206					95% Hawkins Wixley (HW) Approx. Gamma UPL	379.3			95% Percentile	359.7	
207					95% WH Approx. Gamma UTL with 95% Coverage	441.4			99% Percentile	498.4	
208					95% HW Approx. Gamma UTL with 95% Coverage	466					
209					95% WH USL	637.1			95% HW USL	701.8	
210											
211	Lognormal GOF Test										
212					Shapiro Wilk Test Statistic	0.872			Shapiro Wilk Lognormal GOF Test		

213				5% Shapiro Wilk Critical Value	0.945	Data Not Lognormal at 5% Significance Level					
214				Lilliefors Test Statistic	0.177	Lilliefors Lognormal GOF Test					
215				5% Lilliefors Critical Value	0.131	Data Not Lognormal at 5% Significance Level					
216				Data Not Lognormal at 5% Significance Level							
217											
218				Background Statistics assuming Lognormal Distribution							
219				95% UTL with 95% Coverage	589	90% Percentile (z)	322.4				
220				95% UPL (t)	440.9	95% Percentile (z)	423.4				
221				95% USL	1098	99% Percentile (z)	705.8				
222											
223				Nonparametric Distribution Free Background Statistics							
224				Data do not follow a Discernible Distribution (0.05)							
225											
226				Nonparametric Upper Limits for Background Threshold Values							
227				Order of Statistic, r	44	95% UTL with 95% Coverage	320				
228				Approx, f used to compute achieved CC	1.158	pproximate Actual Confidence Coefficient achieved by UTL	0.665				
229						Approximate Sample Size needed to achieve specified CC	93				
230			95% Percentile Bootstrap UTL with	95% Coverage	320	95% BCA Bootstrap UTL with 95% Coverage	320				
231				95% UPL	320	90% Percentile	298.8				
232				90% Chebyshev UPL	435.9	95% Percentile	318				
233				95% Chebyshev UPL	562.9	99% Percentile	320				
234				95% USL	320						
235											
236				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
237				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
238				and consists of observations collected from clean unimpacted locations.							
239				The use of USL tends to provide a balance between false positives and false negatives provided the data							
240				represents a background data set and when many onsite observations need to be compared with the BTV.							
241											
242	F										
243											
244				General Statistics							
245				Total Number of Observations	45	Number of Missing Observations	0				
246				Number of Distinct Observations	12						
247				Number of Detects	10	Number of Non-Detects	35				
248				Number of Distinct Detects	10	Number of Distinct Non-Detects	2				
249				Minimum Detect	0.532	Minimum Non-Detect	0.5				
250				Maximum Detect	1.07	Maximum Non-Detect	1				
251				Variance Detected	0.0258	Percent Non-Detects	77.78%				
252				Mean Detected	0.684	SD Detected	0.161				
253				Mean of Detected Logged Data	-0.401	SD of Detected Logged Data	0.214				
254											
255				Critical Values for Background Threshold Values (BTVs)							
256				Tolerance Factor K (For UTL)	2.085	d2max (for USL)	2.915				
257											
258				Normal GOF Test on Detects Only							
259				Shapiro Wilk Test Statistic	0.83	Shapiro Wilk GOF Test					
260				5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level					
261				Lilliefors Test Statistic	0.212	Lilliefors GOF Test					
262				5% Lilliefors Critical Value	0.262	Detected Data appear Normal at 5% Significance Level					
263				Detected Data appear Approximate Normal at 5% Significance Level							
264											
265				Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							

266				KM Mean	0.542				KM SD	0.106	
267				95% UTL95% Coverage	0.763				95% KM UPL (t)	0.722	
268				90% KM Percentile (z)	0.678				95% KM Percentile (z)	0.716	
269				99% KM Percentile (z)	0.788				95% KM USL	0.85	
270											
271				DL/2 Substitution Background Statistics Assuming Normal Distribution							
272				Mean	0.358				SD	0.198	
273				95% UTL95% Coverage	0.77				95% UPL (t)	0.694	
274				90% Percentile (z)	0.611				95% Percentile (z)	0.683	
275				99% Percentile (z)	0.818				95% USL	0.934	
276				DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons							
277											
278				Gamma GOF Tests on Detected Observations Only							
279				A-D Test Statistic	0.506				Anderson-Darling GOF Test		
280				5% A-D Critical Value	0.725				Detected data appear Gamma Distributed at 5% Significance Level		
281				K-S Test Statistic	0.173				Kolmogorov-Smirnov GOF		
282				5% K-S Critical Value	0.266				Detected data appear Gamma Distributed at 5% Significance Level		
283				Detected data appear Gamma Distributed at 5% Significance Level							
284											
285				Gamma Statistics on Detected Data Only							
286				k hat (MLE)	23.09				k star (bias corrected MLE)	16.23	
287				Theta hat (MLE)	0.0296				Theta star (bias corrected MLE)	0.0422	
288				nu hat (MLE)	461.9				nu star (bias corrected)	324.6	
289				MLE Mean (bias corrected)	0.684						
290				MLE Sd (bias corrected)	0.17				95% Percentile of Chisquare (2kstar)	46.75	
291											
292				Gamma ROS Statistics using Imputed Non-Detects							
293				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
294				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
295				For such situations, GROS method may yield incorrect values of UCLs and BTVs							
296				This is especially true when the sample size is small.							
297				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
298				Minimum	0.01				Mean	0.31	
299				Maximum	1.07				Median	0.274	
300				SD	0.253				CV	0.814	
301				k hat (MLE)	0.957				k star (bias corrected MLE)	0.908	
302				Theta hat (MLE)	0.324				Theta star (bias corrected MLE)	0.342	
303				nu hat (MLE)	86.16				nu star (bias corrected)	81.75	
304				MLE Mean (bias corrected)	0.31				MLE Sd (bias corrected)	0.326	
305				95% Percentile of Chisquare (2kstar)	5.631				90% Percentile	0.732	
306				95% Percentile	0.962				99% Percentile	1.501	
307				The following statistics are computed using Gamma ROS Statistics on Imputed Data							
308				Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
309					WH	HW				WH	HW
310				95% Approx. Gamma UTL with 95% Coverage	1.259	1.446			95% Approx. Gamma UPL	0.977	1.078
311				95% Gamma USL	2.039	2.548					
312											
313				Estimates of Gamma Parameters using KM Estimates							
314				Mean (KM)	0.542				SD (KM)	0.106	
315				Variance (KM)	0.0112				SE of Mean (KM)	0.0168	
316				k hat (KM)	26.31				k star (KM)	24.57	
317				nu hat (KM)	2368				nu star (KM)	2212	
318				theta hat (KM)	0.0206				theta star (KM)	0.0221	

319				80% gamma percentile (KM)		0.632			90% gamma percentile (KM)			0.686
320				95% gamma percentile (KM)		0.734			99% gamma percentile (KM)			0.829
321												
322	The following statistics are computed using gamma distribution and KM estimates											
323	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
324					WH	HW					WH	HW
325	95% Approx. Gamma UTL with 95% Coverage				0.747	0.745	95% Approx. Gamma UPL				0.705	0.703
326				95% KM Gamma Percentile	0.699	0.697				95% Gamma USL	0.844	0.844
327												
328	Lognormal GOF Test on Detected Observations Only											
329				Shapiro Wilk Test Statistic		0.888	Shapiro Wilk GOF Test					
330				5% Shapiro Wilk Critical Value		0.842	Detected Data appear Lognormal at 5% Significance Level					
331				Lilliefors Test Statistic		0.17	Lilliefors GOF Test					
332				5% Lilliefors Critical Value		0.262	Detected Data appear Lognormal at 5% Significance Level					
333	Detected Data appear Lognormal at 5% Significance Level											
334												
335	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
336				Mean in Original Scale		0.405	Mean in Log Scale					-0.998
337				SD in Original Scale		0.187	SD in Log Scale					0.438
338				95% UTL95% Coverage		0.919	95% BCA UTL95% Coverage					1.004
339				95% Bootstrap (%) UTL95% Coverage		1.009	95% UPL (t)					0.776
340				90% Percentile (z)		0.646	95% Percentile (z)					0.758
341				99% Percentile (z)		1.021	95% USL					1.322
342												
343	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
344				KM Mean of Logged Data		-0.626	95% KM UTL (Lognormal)95% Coverage					0.74
345				KM SD of Logged Data		0.156	95% KM UPL (Lognormal)					0.697
346				95% KM Percentile Lognormal (z)		0.691	95% KM USL (Lognormal)					0.842
347												
348	Background DL/2 Statistics Assuming Lognormal Distribution											
349				Mean in Original Scale		0.358	Mean in Log Scale					-1.137
350				SD in Original Scale		0.198	SD in Log Scale					0.434
351				95% UTL95% Coverage		0.792	95% UPL (t)					0.67
352				90% Percentile (z)		0.559	95% Percentile (z)					0.655
353				99% Percentile (z)		0.88	95% USL					1.136
354	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
355												
356	Nonparametric Distribution Free Background Statistics											
357	Data appear to follow a Discernible Distribution at 5% Significance Level											
358												
359	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
360				Order of Statistic, r		44	95% UTL with95% Coverage					1
361				Approx, f used to compute achieved CC		1.158	pproximate Actual Confidence Coefficient achieved by UTL					0.665
362				Approximate Sample Size needed to achieve specified CC		93	95% UPL					1
363				95% USL		1.07	95% KM Chebyshev UPL					1.008
364												
365	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
366	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
367	and consists of observations collected from clean unimpacted locations.											
368	The use of USL tends to provide a balance between false positives and false negatives provided the data											
369	represents a background data set and when many onsite observations need to be compared with the BTV.											
370												
371	pH											

372											
373	General Statistics										
374				Total Number of Observations		45			Number of Distinct Observations		30
375				Minimum		6.45			First Quartile		7.42
376				Second Largest		7.9			Median		7.56
377				Maximum		8			Third Quartile		7.66
378				Mean		7.507			SD		0.327
379				Coefficient of Variation		0.0436			Skewness		-1.874
380				Mean of logged Data		2.015			SD of logged Data		0.0455
381											
382						Critical Values for Background Threshold Values (BTVs)						
383				Tolerance Factor K (For UTL)		2.085			d2max (for USL)		2.915
384											
385						Normal GOF Test					
386				Shapiro Wilk Test Statistic		0.794			Shapiro Wilk GOF Test		
387				5% Shapiro Wilk Critical Value		0.945			Data Not Normal at 5% Significance Level		
388				Lilliefors Test Statistic		0.227			Lilliefors GOF Test		
389				5% Lilliefors Critical Value		0.131			Data Not Normal at 5% Significance Level		
390						Data Not Normal at 5% Significance Level					
391											
392						Background Statistics Assuming Normal Distribution					
393				95% UTL with 95% Coverage		8.189			90% Percentile (z)		7.926
394				95% UPL (t)		8.063			95% Percentile (z)		8.045
395				95% USL		8.461			99% Percentile (z)		8.268
396											
397						Gamma GOF Test					
398				A-D Test Statistic		3.002			Anderson-Darling Gamma GOF Test		
399				5% A-D Critical Value		0.747			Data Not Gamma Distributed at 5% Significance Level		
400				K-S Test Statistic		0.234			Kolmogorov-Smirnov Gamma GOF Test		
401				5% K-S Critical Value		0.131			Data Not Gamma Distributed at 5% Significance Level		
402						Data Not Gamma Distributed at 5% Significance Level					
403											
404						Gamma Statistics					
405				k hat (MLE)		508.3			k star (bias corrected MLE)		474.4
406				Theta hat (MLE)		0.0148			Theta star (bias corrected MLE)		0.0158
407				nu hat (MLE)		45748			nu star (bias corrected)		42700
408				MLE Mean (bias corrected)		7.507			MLE Sd (bias corrected)		0.345
409											
410						Background Statistics Assuming Gamma Distribution					
411				95% Wilson Hilferty (WH) Approx. Gamma UPL		8.088			90% Percentile		7.952
412				95% Hawkins Wixley (HW) Approx. Gamma UPL		8.092			95% Percentile		8.082
413				95% WH Approx. Gamma UTL with 95% Coverage		8.226			99% Percentile		8.332
414				95% HW Approx. Gamma UTL with 95% Coverage		8.231					
415				95% WH USL		8.526			95% HW USL		8.535
416											
417						Lognormal GOF Test					
418				Shapiro Wilk Test Statistic		0.767			Shapiro Wilk Lognormal GOF Test		
419				5% Shapiro Wilk Critical Value		0.945			Data Not Lognormal at 5% Significance Level		
420				Lilliefors Test Statistic		0.24			Lilliefors Lognormal GOF Test		
421				5% Lilliefors Critical Value		0.131			Data Not Lognormal at 5% Significance Level		
422						Data Not Lognormal at 5% Significance Level					
423											
424						Background Statistics assuming Lognormal Distribution					

425				95% UTL with 95% Coverage	8.246			90% Percentile (z)	7.95		
426				95% UPL (t)	8.102			95% Percentile (z)	8.082		
427				95% USL	8.564			99% Percentile (z)	8.337		
428											
429				Nonparametric Distribution Free Background Statistics							
430				Data do not follow a Discernible Distribution (0.05)							
431											
432				Nonparametric Upper Limits for Background Threshold Values							
433				Order of Statistic, r	44			95% UTL with 95% Coverage	7.9		
434				Approx, f used to compute achieved CC	1.158			pproximate Actual Confidence Coefficient achieved by UTL	0.665		
435								Approximate Sample Size needed to achieve specified CC	93		
436				95% Percentile Bootstrap UTL with 95% Coverage	7.98			95% BCA Bootstrap UTL with 95% Coverage	7.9		
437				95% UPL	7.9			90% Percentile	7.868		
438				90% Chebyshev UPL	8.499			95% Percentile	7.9		
439				95% Chebyshev UPL	8.949			99% Percentile	7.956		
440				95% USL	8						
441											
442				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
443				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
444				and consists of observations collected from clean unimpacted locations.							
445				The use of USL tends to provide a balance between false positives and false negatives provided the data							
446				represents a background data set and when many onsite observations need to be compared with the BTV.							
447											
448	SO										
449											
450				General Statistics							
451				Total Number of Observations	45			Number of Missing Observations	0		
452				Number of Distinct Observations	35						
453				Number of Detects	43			Number of Non-Detects	2		
454				Number of Distinct Detects	34			Number of Distinct Non-Detects	1		
455				Minimum Detect	342			Minimum Non-Detect	5		
456				Maximum Detect	2200			Maximum Non-Detect	5		
457				Variance Detected	372440			Percent Non-Detects	4.444%		
458				Mean Detected	1171			SD Detected	610.3		
459				Mean of Detected Logged Data	6.899			SD of Detected Logged Data	0.622		
460											
461				Critical Values for Background Threshold Values (BTVs)							
462				Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915		
463											
464				Normal GOF Test on Detects Only							
465				Shapiro Wilk Test Statistic	0.904			Shapiro Wilk GOF Test			
466				5% Shapiro Wilk Critical Value	0.943			Data Not Normal at 5% Significance Level			
467				Lilliefors Test Statistic	0.146			Lilliefors GOF Test			
468				5% Lilliefors Critical Value	0.134			Data Not Normal at 5% Significance Level			
469				Data Not Normal at 5% Significance Level							
470											
471				Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							
472				KM Mean	1119			KM SD	636.7		
473				95% UTL95% Coverage	2447			95% KM UPL (t)	2201		
474				90% KM Percentile (z)	1935			95% KM Percentile (z)	2167		
475				99% KM Percentile (z)	2600			95% KM USL	2975		
476											
477				DL/2 Substitution Background Statistics Assuming Normal Distribution							

478				Mean	1119				SD	644.1	
479				95% UTL95% Coverage	2462				95% UPL (t)	2213	
480				90% Percentile (z)	1945				95% Percentile (z)	2179	
481				99% Percentile (z)	2618				95% USL	2997	
482	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
483											
484	Gamma GOF Tests on Detected Observations Only										
485				A-D Test Statistic	1.6	Anderson-Darling GOF Test					
486				5% A-D Critical Value	0.755	Data Not Gamma Distributed at 5% Significance Level					
487				K-S Test Statistic	0.169	Kolmogorov-Smirnov GOF					
488				5% K-S Critical Value	0.136	Data Not Gamma Distributed at 5% Significance Level					
489	Data Not Gamma Distributed at 5% Significance Level										
490											
491	Gamma Statistics on Detected Data Only										
492				k hat (MLE)	3.15	k star (bias corrected MLE)	2.945				
493				Theta hat (MLE)	371.8	Theta star (bias corrected MLE)	397.6				
494				nu hat (MLE)	270.9	nu star (bias corrected)	253.3				
495				MLE Mean (bias corrected)	1171						
496				MLE Sd (bias corrected)	682.4	95% Percentile of Chisquare (2kstar)	12.43				
497											
498	Gamma ROS Statistics using Imputed Non-Detects										
499	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
500	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)										
501	For such situations, GROS method may yield incorrect values of UCLs and BTVs										
502	This is especially true when the sample size is small.										
503	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
504				Minimum	194.4	Mean	1129				
505				Maximum	2200	Median	1160				
506				SD	628	CV	0.556				
507				k hat (MLE)	2.696	k star (bias corrected MLE)	2.531				
508				Theta hat (MLE)	418.9	Theta star (bias corrected MLE)	446.1				
509				nu hat (MLE)	242.6	nu star (bias corrected)	227.8				
510				MLE Mean (bias corrected)	1129	MLE Sd (bias corrected)	709.7				
511				95% Percentile of Chisquare (2kstar)	11.17	90% Percentile	2080				
512				95% Percentile	2491	99% Percentile	3389				
513	The following statistics are computed using Gamma ROS Statistics on Imputed Data										
514	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
515					WH	HW				WH	HW
516				95% Approx. Gamma UTL with 95% Coverage	3019	3164	95% Approx. Gamma UPL			2530	2609
517				95% Gamma USL	4275	4651					
518											
519	Estimates of Gamma Parameters using KM Estimates										
520				Mean (KM)	1119	SD (KM)	636.7				
521				Variance (KM)	405361	SE of Mean (KM)	96.03				
522				k hat (KM)	3.091	k star (KM)	2.899				
523				nu hat (KM)	278.2	nu star (KM)	260.9				
524				theta hat (KM)	362.2	theta star (KM)	386				
525				80% gamma percentile (KM)	1603	90% gamma percentile (KM)	2001				
526				95% gamma percentile (KM)	2372	99% gamma percentile (KM)	3179				
527											
528	The following statistics are computed using gamma distribution and KM estimates										
529	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
530					WH	HW				WH	HW

531	95% Approx. Gamma UTL with 95% Coverage				3536	4041	95% Approx. Gamma UPL			2880	3186
532			95% KM Gamma Percentile		2796	3078			95% Gamma USL	5268	6450
533											
534	Lognormal GOF Test on Detected Observations Only										
535				Shapiro Wilk Test Statistic		0.872	Shapiro Wilk GOF Test				
536				5% Shapiro Wilk Critical Value		0.943	Data Not Lognormal at 5% Significance Level				
537				Lilliefors Test Statistic		0.179	Lilliefors GOF Test				
538				5% Lilliefors Critical Value		0.134	Data Not Lognormal at 5% Significance Level				
539	Data Not Lognormal at 5% Significance Level										
540											
541	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
542				Mean in Original Scale		1129	Mean in Log Scale				6.834
543				SD in Original Scale		627.4	SD in Log Scale				0.679
544				95% UTL95% Coverage		3826	95% BCA UTL95% Coverage				2200
545				95% Bootstrap (%) UTL95% Coverage		2200	95% UPL (t)				2944
546				90% Percentile (z)		2218	95% Percentile (z)				2838
547				99% Percentile (z)		4507	95% USL				6723
548											
549	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
550				KM Mean of Logged Data		6.664	95% KM UTL (Lognormal)95% Coverage				10496
551				KM SD of Logged Data		1.245	95% KM UPL (Lognormal)				6490
552				95% KM Percentile Lognormal (z)		6068	95% KM USL (Lognormal)				29499
553											
554	Background DL/2 Statistics Assuming Lognormal Distribution										
555				Mean in Original Scale		1119	Mean in Log Scale				6.633
556				SD in Original Scale		644.1	SD in Log Scale				1.387
557				95% UTL95% Coverage		13694	95% UPL (t)				8014
558				90% Percentile (z)		4493	95% Percentile (z)				7436
559				99% Percentile (z)		19136	95% USL				43313
560	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
561											
562	Nonparametric Distribution Free Background Statistics										
563	Data do not follow a Discernible Distribution (0.05)										
564											
565	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
566				Order of Statistic, r		44	95% UTL with95% Coverage				2200
567				Approx, f used to compute achieved CC		1.158	pproximate Actual Confidence Coefficient achieved by UTL				0.665
568	Approximate Sample Size needed to achieve specified CC					93	95% UPL				2200
569				95% USL		2200	95% KM Chebyshev UPL				3925
570											
571	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
572	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
573	and consists of observations collected from clean unimpacted locations.										
574	The use of USL tends to provide a balance between false positives and false negatives provided the data										
575	represents a background data set and when many onsite observations need to be compared with the BTV.										
576											
577	TDS										
578											
579	General Statistics										
580				Total Number of Observations		45	Number of Distinct Observations				34
581				Minimum		798	First Quartile				1170
582				Second Largest		3900	Median				2300
583				Maximum		4000	Third Quartile				2800

584				Mean	2194				SD	990.7	
585				Coefficient of Variation	0.451				Skewness	0.0625	
586				Mean of logged Data	7.574				SD of logged Data	0.519	
587											
588				Critical Values for Background Threshold Values (BTVs)							
589				Tolerance Factor K (For UTL)	2.085				d2max (for USL)	2.915	
590											
591				Normal GOF Test							
592				Shapiro Wilk Test Statistic	0.911	Shapiro Wilk GOF Test					
593				5% Shapiro Wilk Critical Value	0.945	Data Not Normal at 5% Significance Level					
594				Lilliefors Test Statistic	0.15	Lilliefors GOF Test					
595				5% Lilliefors Critical Value	0.131	Data Not Normal at 5% Significance Level					
596				Data Not Normal at 5% Significance Level							
597											
598				Background Statistics Assuming Normal Distribution							
599			95% UTL with	95% Coverage	4260				90% Percentile (z)	3464	
600				95% UPL (t)	3877				95% Percentile (z)	3824	
601				95% USL	5083				99% Percentile (z)	4499	
602											
603				Gamma GOF Test							
604				A-D Test Statistic	1.631	Anderson-Darling Gamma GOF Test					
605				5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level					
606				K-S Test Statistic	0.144	Kolmogorov-Smirnov Gamma GOF Test					
607				5% K-S Critical Value	0.132	Data Not Gamma Distributed at 5% Significance Level					
608				Data Not Gamma Distributed at 5% Significance Level							
609											
610				Gamma Statistics							
611				k hat (MLE)	4.344				k star (bias corrected MLE)	4.069	
612				Theta hat (MLE)	505.1				Theta star (bias corrected MLE)	539.2	
613				nu hat (MLE)	391				nu star (bias corrected)	366.2	
614				MLE Mean (bias corrected)	2194				MLE Sd (bias corrected)	1088	
615											
616				Background Statistics Assuming Gamma Distribution							
617			95% Wilson Hilferty (WH) Approx. Gamma UPL		4285				90% Percentile	3652	
618			95% Hawkins Wixley (HW) Approx. Gamma UPL		4369				95% Percentile	4234	
619			95% WH Approx. Gamma UTL with	95% Coverage	4961				99% Percentile	5476	
620			95% HW Approx. Gamma UTL with	95% Coverage	5113						
621				95% WH USL	6648				95% HW USL	7030	
622											
623				Lognormal GOF Test							
624				Shapiro Wilk Test Statistic	0.876	Shapiro Wilk Lognormal GOF Test					
625				5% Shapiro Wilk Critical Value	0.945	Data Not Lognormal at 5% Significance Level					
626				Lilliefors Test Statistic	0.159	Lilliefors Lognormal GOF Test					
627				5% Lilliefors Critical Value	0.131	Data Not Lognormal at 5% Significance Level					
628				Data Not Lognormal at 5% Significance Level							
629											
630				Background Statistics assuming Lognormal Distribution							
631			95% UTL with	95% Coverage	5750				90% Percentile (z)	3788	
632				95% UPL (t)	4705				95% Percentile (z)	4575	
633				95% USL	8850				99% Percentile (z)	6518	
634											
635				Nonparametric Distribution Free Background Statistics							
636				Data do not follow a Discernible Distribution (0.05)							

	A	B	C	D	E	F	G	H	I	J	K	L
637												
638					Nonparametric Upper Limits for Background Threshold Values							
639					Order of Statistic, r	44			95% UTL with	95% Coverage		3900
640					Approx, f used to compute achieved CC	1.158			pproximate Actual Confidence Coefficient achieved by UTL			0.665
641									Approximate Sample Size needed to achieve specified CC			93
642			95% Percentile Bootstrap UTL with	95% Coverage		3980			95% BCA Bootstrap UTL with	95% Coverage		3980
643				95% UPL		3900				90% Percentile		3442
644				90% Chebyshev UPL		5199				95% Percentile		3880
645				95% Chebyshev UPL		6561				99% Percentile		3956
646				95% USL		4000						
647												
648					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
649					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
650					and consists of observations collected from clean unimpacted locations.							
651					The use of USL tends to provide a balance between false positives and false negatives provided the data							
652					represents a background data set and when many onsite observations need to be compared with the BTV.							
653												

Background Statistics for Data Sets with Non-Detects		
User Selected Options		
Date/Time of Computation	ProUCL 5.110/13/2022 9:05:18 AM	
From File	LRS_ProUCL_UPL_Input_2021_v1_b.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Coverage	95%	
Different or Future K Observations	1	
Number of Bootstrap Operations	2000	

Sb

General Statistics

Total Number of Observations	45	Number of Missing Observations	0
Number of Distinct Observations	2		
Number of Detects	0	Number of Non-Detects	45
Number of Distinct Detects	0	Number of Distinct Non-Detects	2
Minimum Detect	N/A	Minimum Non-Detect	0.002
Maximum Detect	N/A	Maximum Non-Detect	0.02
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Sb was not processed!

As

General Statistics

Total Number of Observations	45	Number of Missing Observations	0
Number of Distinct Observations	2		
Number of Detects	0	Number of Non-Detects	45
Number of Distinct Detects	0	Number of Distinct Non-Detects	2
Minimum Detect	N/A	Minimum Non-Detect	0.005
Maximum Detect	N/A	Maximum Non-Detect	0.05
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable As was not processed!

Ba

General Statistics

54					Total Number of Observations	45				Number of Distinct Observations		36
55					Minimum	0.0189				First Quartile		0.027
56					Second Largest	0.061				Median		0.032
57					Maximum	0.069				Third Quartile		0.0383
58					Mean	0.0344				SD		0.011
59					Coefficient of Variation	0.32				Skewness		1.067
60					Mean of logged Data	-3.415				SD of logged Data		0.305
61												
62					Critical Values for Background Threshold Values (BTVs)							
63					Tolerance Factor K (For UTL)	2.085				d2max (for USL)		2.915
64												
65					Normal GOF Test							
66					Shapiro Wilk Test Statistic	0.924				Shapiro Wilk GOF Test		
67					5% Shapiro Wilk Critical Value	0.945				Data Not Normal at 5% Significance Level		
68					Lilliefors Test Statistic	0.138				Lilliefors GOF Test		
69					5% Lilliefors Critical Value	0.131				Data Not Normal at 5% Significance Level		
70					Data Not Normal at 5% Significance Level							
71												
72					Background Statistics Assuming Normal Distribution							
73				95% UTL with	95% Coverage	0.0574				90% Percentile (z)		0.0485
74					95% UPL (t)	0.0531				95% Percentile (z)		0.0525
75					95% USL	0.0665				99% Percentile (z)		0.06
76												
77					Gamma GOF Test							
78					A-D Test Statistic	0.399				Anderson-Darling Gamma GOF Test		
79					5% A-D Critical Value	0.748				Detected data appear Gamma Distributed at 5% Significance Level		
80					K-S Test Statistic	0.0983				Kolmogorov-Smirnov Gamma GOF Test		
81					5% K-S Critical Value	0.132				Detected data appear Gamma Distributed at 5% Significance Level		
82					Detected data appear Gamma Distributed at 5% Significance Level							
83												
84					Gamma Statistics							
85					k hat (MLE)	10.95				k star (bias corrected MLE)		10.23
86					Theta hat (MLE)	0.00314				Theta star (bias corrected MLE)		0.00336
87					nu hat (MLE)	985.3				nu star (bias corrected)		921
88					MLE Mean (bias corrected)	0.0344				MLE Sd (bias corrected)		0.0108
89												
90					Background Statistics Assuming Gamma Distribution							
91				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0541				90% Percentile		0.0487
92				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.0543				95% Percentile		0.0538
93				95% WH Approx. Gamma UTL with	95% Coverage	0.0598				99% Percentile		0.0643
94				95% HW Approx. Gamma UTL with	95% Coverage	0.0603						
95					95% WH USL	0.0733				95% HW USL		0.0747
96												
97					Lognormal GOF Test							
98					Shapiro Wilk Test Statistic	0.973				Shapiro Wilk Lognormal GOF Test		
99					5% Shapiro Wilk Critical Value	0.945				Data appear Lognormal at 5% Significance Level		
100					Lilliefors Test Statistic	0.0779				Lilliefors Lognormal GOF Test		
101					5% Lilliefors Critical Value	0.131				Data appear Lognormal at 5% Significance Level		
102					Data appear Lognormal at 5% Significance Level							
103												
104					Background Statistics assuming Lognormal Distribution							
105				95% UTL with	95% Coverage	0.0621				90% Percentile (z)		0.0486
106					95% UPL (t)	0.0552				95% Percentile (z)		0.0543

107				95% USL	0.08			99% Percentile (z)			0.0668
108											
109				Nonparametric Distribution Free Background Statistics							
110				Data appear Gamma Distributed at 5% Significance Level							
111											
112				Nonparametric Upper Limits for Background Threshold Values							
113				Order of Statistic, r	44			95% UTL with 95% Coverage			0.061
114				Approx, f used to compute achieved CC	1.158			pproximate Actual Confidence Coefficient achieved by UTL			0.665
115								Approximate Sample Size needed to achieve specified CC			93
116				95% Percentile Bootstrap UTL with 95% Coverage	0.0674			95% BCA Bootstrap UTL with 95% Coverage			0.0664
117				95% UPL	0.0595			90% Percentile			0.0466
118				90% Chebyshev UPL	0.0678			95% Percentile			0.0548
119				95% Chebyshev UPL	0.083			99% Percentile			0.0655
120				95% USL	0.069						
121											
122				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
123				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
124				and consists of observations collected from clean unimpacted locations.							
125				The use of USL tends to provide a balance between false positives and false negatives provided the data							
126				represents a background data set and when many onsite observations need to be compared with the BTV.							
127											
128	Be										
129											
130				General Statistics							
131				Total Number of Observations	45			Number of Missing Observations			0
132				Number of Distinct Observations	2						
133				Number of Detects	0			Number of Non-Detects			45
134				Number of Distinct Detects	0			Number of Distinct Non-Detects			2
135				Minimum Detect	N/A			Minimum Non-Detect			0.001
136				Maximum Detect	N/A			Maximum Non-Detect			0.01
137				Variance Detected	N/A			Percent Non-Detects			100%
138				Mean Detected	N/A			SD Detected			N/A
139				Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A
140											
141				Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!							
142				Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!							
143				The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
144											
145				The data set for variable Be was not processed!							
146											
147											
148	Cd										
149											
150				General Statistics							
151				Total Number of Observations	45			Number of Missing Observations			0
152				Number of Distinct Observations	2						
153				Number of Detects	0			Number of Non-Detects			45
154				Number of Distinct Detects	0			Number of Distinct Non-Detects			2
155				Minimum Detect	N/A			Minimum Non-Detect			0.001
156				Maximum Detect	N/A			Maximum Non-Detect			0.01
157				Variance Detected	N/A			Percent Non-Detects			100%
158				Mean Detected	N/A			SD Detected			N/A
159				Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A

160											
161	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
162	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
163	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
164											
165	The data set for variable Cd was not processed!										
166											
167											
168	Cr										
169											
170	General Statistics										
171				Total Number of Observations	45			Number of Missing Observations	0		
172				Number of Distinct Observations	31						
173				Number of Detects	33			Number of Non-Detects	12		
174				Number of Distinct Detects	28			Number of Distinct Non-Detects	3		
175				Minimum Detect	0.00217			Minimum Non-Detect	0.002		
176				Maximum Detect	0.0089			Maximum Non-Detect	0.02		
177				Variance Detected	2.7772E-6			Percent Non-Detects	26.67%		
178				Mean Detected	0.00369			SD Detected	0.00167		
179				Mean of Detected Logged Data	-5.677			SD of Detected Logged Data	0.372		
180											
181	Critical Values for Background Threshold Values (BTVs)										
182				Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915		
183											
184	Normal GOF Test on Detects Only										
185				Shapiro Wilk Test Statistic	0.776			Shapiro Wilk GOF Test			
186				5% Shapiro Wilk Critical Value	0.931			Data Not Normal at 5% Significance Level			
187				Lilliefors Test Statistic	0.198			Lilliefors GOF Test			
188				5% Lilliefors Critical Value	0.152			Data Not Normal at 5% Significance Level			
189	Data Not Normal at 5% Significance Level										
190											
191	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
192				KM Mean	0.00339			KM SD	0.00159		
193				95% UTL95% Coverage	0.00671			95% KM UPL (t)	0.00609		
194				90% KM Percentile (z)	0.00543			95% KM Percentile (z)	0.00601		
195				99% KM Percentile (z)	0.00709			95% KM USL	0.00803		
196											
197	DL/2 Substitution Background Statistics Assuming Normal Distribution										
198				Mean	0.00367			SD	0.00241		
199				95% UTL95% Coverage	0.0087			95% UPL (t)	0.00777		
200				90% Percentile (z)	0.00677			95% Percentile (z)	0.00764		
201				99% Percentile (z)	0.00929			95% USL	0.0107		
202	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
203											
204	Gamma GOF Tests on Detected Observations Only										
205				A-D Test Statistic	1.285			Anderson-Darling GOF Test			
206				5% A-D Critical Value	0.748			Data Not Gamma Distributed at 5% Significance Level			
207				K-S Test Statistic	0.151			Kolmogorov-Smirnov GOF			
208				5% K-S Critical Value	0.153			Detected data appear Gamma Distributed at 5% Significance Level			
209	Detected data follow Appr. Gamma Distribution at 5% Significance Level										
210											
211	Gamma Statistics on Detected Data Only										
212				k hat (MLE)	6.787			k star (bias corrected MLE)	6.19		

	A	B	C	D	E	F	G	H	I	J	K	L
213				Theta hat (MLE)		5.4401E-4			Theta star (bias corrected MLE)			5.9646E-4
214				nu hat (MLE)		447.9			nu star (bias corrected)			408.5
215				MLE Mean (bias corrected)		0.00369						
216				MLE Sd (bias corrected)		0.00148			95% Percentile of Chisquare (2kstar)			21.54
217												
218					Gamma ROS Statistics using Imputed Non-Detects							
219					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
220					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
221					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
222					This is especially true when the sample size is small.							
223					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
224				Minimum		0.00217			Mean			0.00537
225				Maximum		0.01			Median			0.0039
226				SD		0.00316			CV			0.588
227				k hat (MLE)		3.186			k star (bias corrected MLE)			2.989
228				Theta hat (MLE)		0.00169			Theta star (bias corrected MLE)			0.0018
229				nu hat (MLE)		286.8			nu star (bias corrected)			269
230				MLE Mean (bias corrected)		0.00537			MLE Sd (bias corrected)			0.00311
231				95% Percentile of Chisquare (2kstar)		12.56			90% Percentile			0.00954
232				95% Percentile		0.0113			99% Percentile			0.0151
233					The following statistics are computed using Gamma ROS Statistics on Imputed Data							
234					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
235					WH	HW					WH	HW
236				95% Approx. Gamma UTL with 95% Coverage	0.0135	0.0138			95% Approx. Gamma UPL		0.0114	0.0116
237				95% Gamma USL	0.0187	0.0197						
238												
239					Estimates of Gamma Parameters using KM Estimates							
240				Mean (KM)		0.00339			SD (KM)			0.00159
241				Variance (KM)		2.5228E-6			SE of Mean (KM)			2.5118E-4
242				k hat (KM)		4.568			k star (KM)			4.279
243				nu hat (KM)		411.2			nu star (KM)			385.1
244				theta hat (KM)		7.4313E-4			theta star (KM)			7.9345E-4
245				80% gamma percentile (KM)		0.00464			90% gamma percentile (KM)			0.00559
246				95% gamma percentile (KM)		0.00647			99% gamma percentile (KM)			0.00832
247												
248					The following statistics are computed using gamma distribution and KM estimates							
249					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
250					WH	HW					WH	HW
251				95% Approx. Gamma UTL with 95% Coverage	0.00678	0.00681			95% Approx. Gamma UPL		0.00598	0.00598
252				95% KM Gamma Percentile	0.00587	0.00587			95% Gamma USL		0.00873	0.00888
253												
254					Lognormal GOF Test on Detected Observations Only							
255				Shapiro Wilk Test Statistic		0.901			Shapiro Wilk GOF Test			
256				5% Shapiro Wilk Critical Value		0.931			Data Not Lognormal at 5% Significance Level			
257				Lilliefors Test Statistic		0.126			Lilliefors GOF Test			
258				5% Lilliefors Critical Value		0.152			Detected Data appear Lognormal at 5% Significance Level			
259					Detected Data appear Approximate Lognormal at 5% Significance Level							
260												
261					Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects							
262				Mean in Original Scale		0.0033			Mean in Log Scale			-5.811
263				SD in Original Scale		0.00163			SD in Log Scale			0.438
264				95% UTL95% Coverage		0.00746			95% BCA UTL95% Coverage			0.00814
265				95% Bootstrap (%) UTL95% Coverage		0.00872			95% UPL (t)			0.0063

266				90% Percentile (z)	0.00525				95% Percentile (z)		0.00615
267				99% Percentile (z)	0.00829				95% USL		0.0107
268											
269	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
270				KM Mean of Logged Data	-5.768				95% KM UTL (Lognormal)95% Coverage		0.00694
271				KM SD of Logged Data	0.382				95% KM UPL (Lognormal)		0.00599
272				95% KM Percentile Lognormal (z)	0.00586				95% KM USL (Lognormal)		0.00953
273											
274	Background DL/2 Statistics Assuming Lognormal Distribution										
275				Mean in Original Scale	0.00367				Mean in Log Scale		-5.791
276				SD in Original Scale	0.00241				SD in Log Scale		0.616
277				95% UTL95% Coverage	0.011				95% UPL (t)		0.0087
278				90% Percentile (z)	0.00673				95% Percentile (z)		0.00842
279				99% Percentile (z)	0.0128				95% USL		0.0184
280	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
281											
282	Nonparametric Distribution Free Background Statistics										
283	Data appear to follow a Discernible Distribution at 5% Significance Level										
284											
285	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
286				Order of Statistic, r	44				95% UTL with95% Coverage		0.02
287				Approx, f used to compute achieved CC	1.158				pproximate Actual Confidence Coefficient achieved by UTL		0.665
288			Approximate Sample Size needed to achieve specified CC		93				95% UPL		0.02
289				95% USL	0.02				95% KM Chebyshev UPL		0.0104
290											
291	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
292	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
293	and consists of observations collected from clean unimpacted locations.										
294	The use of USL tends to provide a balance between false positives and false negatives provided the data										
295	represents a background data set and when many onsite observations need to be compared with the BTV.										
296											
297	Co										
298											
299	General Statistics										
300				Total Number of Observations	42				Number of Missing Observations		0
301				Number of Distinct Observations	6						
302				Number of Detects	5				Number of Non-Detects		37
303				Number of Distinct Detects	5				Number of Distinct Non-Detects		2
304				Minimum Detect	0.001				Minimum Non-Detect		0.001
305				Maximum Detect	0.0016				Maximum Non-Detect		0.01
306				Variance Detected	5.0280E-8				Percent Non-Detects		88.1%
307				Mean Detected	0.00122				SD Detected		2.2423E-4
308				Mean of Detected Logged Data	-6.718				SD of Detected Logged Data		0.172
309											
310	Critical Values for Background Threshold Values (BTVs)										
311				Tolerance Factor K (For UTL)	2.104				d2max (for USL)		2.887
312											
313	Normal GOF Test on Detects Only										
314				Shapiro Wilk Test Statistic	0.849				Shapiro Wilk GOF Test		
315				5% Shapiro Wilk Critical Value	0.762				Detected Data appear Normal at 5% Significance Level		
316				Lilliefors Test Statistic	0.343				Lilliefors GOF Test		
317				5% Lilliefors Critical Value	0.343				Detected Data appear Normal at 5% Significance Level		
318	Detected Data appear Normal at 5% Significance Level										

	A	B	C	D	E	F	G	H	I	J	K	L
319												
320	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
321				KM Mean		0.00103			KM SD			1.0375E-4
322				95% UTL95% Coverage		0.00125			95% KM UPL (t)			0.00121
323				90% KM Percentile (z)		0.00116			95% KM Percentile (z)			0.0012
324				99% KM Percentile (z)		0.00127			95% KM USL			0.00133
325												
326	DL/2 Substitution Background Statistics Assuming Normal Distribution											
327				Mean		9.0762E-4			SD			0.00117
328				95% UTL95% Coverage		0.00338			95% UPL (t)			0.00291
329				90% Percentile (z)		0.00241			95% Percentile (z)			0.00284
330				99% Percentile (z)		0.00364			95% USL			0.0043
331	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
332												
333	Gamma GOF Tests on Detected Observations Only											
334				A-D Test Statistic		0.47			Anderson-Darling GOF Test			
335				5% A-D Critical Value		0.678			Detected data appear Gamma Distributed at 5% Significance Level			
336				K-S Test Statistic		0.329			Kolmogorov-Smirnov GOF			
337				5% K-S Critical Value		0.357			Detected data appear Gamma Distributed at 5% Significance Level			
338	Detected data appear Gamma Distributed at 5% Significance Level											
339												
340	Gamma Statistics on Detected Data Only											
341				k hat (MLE)		40.65			k star (bias corrected MLE)			16.39
342				Theta hat (MLE)		3.0111E-5			Theta star (bias corrected MLE)			7.4665E-5
343				nu hat (MLE)		406.5			nu star (bias corrected)			163.9
344				MLE Mean (bias corrected)		0.00122						
345				MLE Sd (bias corrected)		3.0231E-4			95% Percentile of Chisquare (2kstar)			47.14
346												
347	Gamma ROS Statistics using Imputed Non-Detects											
348	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
349	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
350	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
351	This is especially true when the sample size is small.											
352	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
353				Minimum		0.001			Mean			0.00896
354				Maximum		0.01			Median			0.01
355				SD		0.00288			CV			0.321
356				k hat (MLE)		3.7			k star (bias corrected MLE)			3.452
357				Theta hat (MLE)		0.00242			Theta star (bias corrected MLE)			0.00259
358				nu hat (MLE)		310.8			nu star (bias corrected)			289.9
359				MLE Mean (bias corrected)		0.00896			MLE Sd (bias corrected)			0.00482
360				95% Percentile of Chisquare (2kstar)		13.93			90% Percentile			0.0154
361				95% Percentile		0.0181			99% Percentile			0.0238
362	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
363	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
364					WH	HW				WH	HW	
365			95% Approx. Gamma UTL with 95% Coverage		0.0214	0.0232			95% Approx. Gamma UPL	0.0183	0.0194	
366				95% Gamma USL	0.0285	0.0322						
367												
368	Estimates of Gamma Parameters using KM Estimates											
369				Mean (KM)		0.00103			SD (KM)			1.0375E-4
370				Variance (KM)		1.0765E-8			SE of Mean (KM)			1.8575E-5
371				k hat (KM)		98.31			k star (KM)			91.3

372				nu hat (KM)	8258			nu star (KM)	7669		
373				theta hat (KM)	1.0465E-5			theta star (KM)	1.1268E-5		
374				80% gamma percentile (KM)	0.00112			90% gamma percentile (KM)	0.00117		
375				95% gamma percentile (KM)	0.00121			99% gamma percentile (KM)	0.0013		
376											
377	The following statistics are computed using gamma distribution and KM estimates										
378	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
379					WH	HW				WH	HW
380	95% Approx. Gamma UTL with 95% Coverage				0.00123	0.00123	95% Approx. Gamma UPL			0.00119	0.00119
381	95% KM Gamma Percentile				0.00118	0.00118	95% Gamma USL			0.00131	0.00131
382											
383	Lognormal GOF Test on Detected Observations Only										
384	Shapiro Wilk Test Statistic				0.889		Shapiro Wilk GOF Test				
385	5% Shapiro Wilk Critical Value				0.762		Detected Data appear Lognormal at 5% Significance Level				
386	Lilliefors Test Statistic				0.317		Lilliefors GOF Test				
387	5% Lilliefors Critical Value				0.343		Detected Data appear Lognormal at 5% Significance Level				
388	Detected Data appear Lognormal at 5% Significance Level										
389											
390	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
391	Mean in Original Scale				5.9081E-4		Mean in Log Scale			-7.552	
392	SD in Original Scale				3.0343E-4		SD in Log Scale			0.491	
393	95% UTL95% Coverage				0.00148		95% BCA UTL95% Coverage			0.00158	
394	95% Bootstrap (%) UTL95% Coverage				0.00158		95% UPL (t)			0.00121	
395	90% Percentile (z)				9.8516E-4		95% Percentile (z)			0.00118	
396	99% Percentile (z)				0.00165		95% USL			0.00217	
397											
398	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
399	KM Mean of Logged Data				-6.883		95% KM UTL (Lognormal)95% Coverage			0.00122	
400	KM SD of Logged Data				0.0841		95% KM UPL (Lognormal)			0.00118	
401	95% KM Percentile Lognormal (z)				0.00118		95% KM USL (Lognormal)			0.00131	
402											
403	Background DL/2 Statistics Assuming Lognormal Distribution										
404	Mean in Original Scale				9.0762E-4		Mean in Log Scale			-7.331	
405	SD in Original Scale				0.00117		SD in Log Scale			0.641	
406	95% UTL95% Coverage				0.00252		95% UPL (t)			0.00195	
407	90% Percentile (z)				0.00149		95% Percentile (z)			0.00188	
408	99% Percentile (z)				0.00291		95% USL			0.00417	
409	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
410											
411	Nonparametric Distribution Free Background Statistics										
412	Data appear to follow a Discernible Distribution at 5% Significance Level										
413											
414	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
415	Order of Statistic, r				42		95% UTL with95% Coverage			0.01	
416	Approx, f used to compute achieved CC				2.211		pproximate Actual Confidence Coefficient achieved by UTL			0.884	
417	Approximate Sample Size needed to achieve specified CC				59		95% UPL			0.01	
418	95% USL				0.01		95% KM Chebyshev UPL			0.00149	
419											
420	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
421	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
422	and consists of observations collected from clean unimpacted locations.										
423	The use of USL tends to provide a balance between false positives and false negatives provided the data										
424	represents a background data set and when many onsite observations need to be compared with the BTV.										

Pb

General Statistics

Total Number of Observations	42	Number of Missing Observations	0
Number of Distinct Observations	2		
Number of Detects	0	Number of Non-Detects	42
Number of Distinct Detects	0	Number of Distinct Non-Detects	2
Minimum Detect	N/A	Minimum Non-Detect	0.001
Maximum Detect	N/A	Maximum Non-Detect	0.01
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Pb was not processed!

Li

General Statistics

Total Number of Observations	45	Number of Missing Observations	0
Number of Distinct Observations	42		
Number of Detects	43	Number of Non-Detects	2
Number of Distinct Detects	40	Number of Distinct Non-Detects	2
Minimum Detect	0.0305	Minimum Non-Detect	0.0437
Maximum Detect	0.085	Maximum Non-Detect	0.0507
Variance Detected	2.4551E-4	Percent Non-Detects	4.444%
Mean Detected	0.0541	SD Detected	0.0157
Mean of Detected Logged Data	-2.961	SD of Detected Logged Data	0.301

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.085	d2max (for USL)	2.915

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.942	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.943	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.13	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.134	Detected Data appear Normal at 5% Significance Level	

Detected Data appear Approximate Normal at 5% Significance Level

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.0533	KM SD	0.0156
95% UTL95% Coverage	0.0858	95% KM UPL (t)	0.0797
90% KM Percentile (z)	0.0733	95% KM Percentile (z)	0.0789
99% KM Percentile (z)	0.0895	95% KM USL	0.0987

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	0.0527	SD	0.0166
95% UTL95% Coverage	0.0873	95% UPL (t)	0.0809

478				90% Percentile (z)	0.074				95% Percentile (z)		0.08
479				99% Percentile (z)	0.0913				95% USL		0.101
480	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
481											
482	Gamma GOF Tests on Detected Observations Only										
483				A-D Test Statistic	0.753	Anderson-Darling GOF Test					
484				5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level					
485				K-S Test Statistic	0.116	Kolmogorov-Smirnov GOF					
486				5% K-S Critical Value	0.135	Detected data appear Gamma Distributed at 5% Significance Level					
487	Detected data follow Appr. Gamma Distribution at 5% Significance Level										
488											
489	Gamma Statistics on Detected Data Only										
490				k hat (MLE)	11.8	k star (bias corrected MLE)	10.99				
491				Theta hat (MLE)	0.00458	Theta star (bias corrected MLE)	0.00492				
492				nu hat (MLE)	1015	nu star (bias corrected)	945.1				
493				MLE Mean (bias corrected)	0.0541						
494				MLE Sd (bias corrected)	0.0163	95% Percentile of Chisquare (2kstar)	33.9				
495											
496	Gamma ROS Statistics using Imputed Non-Detects										
497	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
498	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)										
499	For such situations, GROS method may yield incorrect values of UCLs and BTVs										
500	This is especially true when the sample size is small.										
501	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
502				Minimum	0.0305	Mean	0.0534				
503				Maximum	0.085	Median	0.054				
504				SD	0.0156	CV	0.292				
505				k hat (MLE)	11.82	k star (bias corrected MLE)	11.04				
506				Theta hat (MLE)	0.00452	Theta star (bias corrected MLE)	0.00484				
507				nu hat (MLE)	1064	nu star (bias corrected)	993.9				
508				MLE Mean (bias corrected)	0.0534	MLE Sd (bias corrected)	0.0161				
509				95% Percentile of Chisquare (2kstar)	34.03	90% Percentile	0.0748				
510				95% Percentile	0.0823	99% Percentile	0.0977				
511	The following statistics are computed using Gamma ROS Statistics on Imputed Data										
512	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
513					WH	HW				WH	HW
514				95% Approx. Gamma UTL with 95% Coverage	0.0912	0.0921	95% Approx. Gamma UPL			0.0828	0.0833
515				95% Gamma USL	0.111	0.114					
516											
517	Estimates of Gamma Parameters using KM Estimates										
518				Mean (KM)	0.0533	SD (KM)	0.0156				
519				Variance (KM)	2.4200E-4	SE of Mean (KM)	0.00235				
520				k hat (KM)	11.75	k star (KM)	10.98				
521				nu hat (KM)	1057	nu star (KM)	988.1				
522				theta hat (KM)	0.00454	theta star (KM)	0.00486				
523				80% gamma percentile (KM)	0.0662	90% gamma percentile (KM)	0.0747				
524				95% gamma percentile (KM)	0.0822	99% gamma percentile (KM)	0.0977				
525											
526	The following statistics are computed using gamma distribution and KM estimates										
527	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
528					WH	HW				WH	HW
529				95% Approx. Gamma UTL with 95% Coverage	0.091	0.092	95% Approx. Gamma UPL			0.0826	0.0831
530				95% KM Gamma Percentile	0.0815	0.082	95% Gamma USL			0.111	0.113

531											
532	Lognormal GOF Test on Detected Observations Only										
533				Shapiro Wilk Test Statistic	0.935	Shapiro Wilk GOF Test					
534				5% Shapiro Wilk Critical Value	0.943	Data Not Lognormal at 5% Significance Level					
535				Lilliefors Test Statistic	0.135	Lilliefors GOF Test					
536				5% Lilliefors Critical Value	0.134	Data Not Lognormal at 5% Significance Level					
537	Data Not Lognormal at 5% Significance Level										
538											
539	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
540				Mean in Original Scale	0.0534	Mean in Log Scale	-2.973				
541				SD in Original Scale	0.0156	SD in Log Scale	0.299				
542				95% UTL95% Coverage	0.0955	95% BCA UTL95% Coverage	0.0842				
543				95% Bootstrap (%) UTL95% Coverage	0.0846	95% UPL (t)	0.0851				
544				90% Percentile (z)	0.0751	95% Percentile (z)	0.0837				
545				99% Percentile (z)	0.103	95% USL	0.122				
546											
547	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
548				KM Mean of Logged Data	-2.976	95% KM UTL (Lognormal)95% Coverage	0.0953				
549				KM SD of Logged Data	0.3	95% KM UPL (Lognormal)	0.0849				
550				95% KM Percentile Lognormal (z)	0.0835	95% KM USL (Lognormal)	0.122				
551											
552	Background DL/2 Statistics Assuming Lognormal Distribution										
553				Mean in Original Scale	0.0527	Mean in Log Scale	-2.996				
554				SD in Original Scale	0.0166	SD in Log Scale	0.337				
555				95% UTL95% Coverage	0.101	95% UPL (t)	0.0887				
556				90% Percentile (z)	0.077	95% Percentile (z)	0.0871				
557				99% Percentile (z)	0.11	95% USL	0.134				
558	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
559											
560	Nonparametric Distribution Free Background Statistics										
561	Data appear to follow a Discernible Distribution at 5% Significance Level										
562											
563	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
564				Order of Statistic, r	44	95% UTL with95% Coverage	0.083				
565				Approx, f used to compute achieved CC	1.158	pproximate Actual Confidence Coefficient achieved by UTL	0.665				
566				Approximate Sample Size needed to achieve specified CC	93	95% UPL	0.0824				
567				95% USL	0.085	95% KM Chebyshev UPL	0.122				
568											
569	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
570	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
571	and consists of observations collected from clean unimpacted locations.										
572	The use of USL tends to provide a balance between false positives and false negatives provided the data										
573	represents a background data set and when many onsite observations need to be compared with the BTV.										
574											
575	Hg										
576											
577	General Statistics										
578				Total Number of Observations	42	Number of Missing Observations	0				
579				Number of Distinct Observations	1						
580				Number of Detects	0	Number of Non-Detects	42				
581				Number of Distinct Detects	0	Number of Distinct Non-Detects	1				
582				Minimum Detect	N/A	Minimum Non-Detect	2.0000E-4				
583				Maximum Detect	N/A	Maximum Non-Detect	2.0000E-4				

584				Variance Detected	N/A				Percent Non-Detects		100%
585				Mean Detected	N/A				SD Detected		N/A
586				Mean of Detected Logged Data	N/A				SD of Detected Logged Data		N/A
587											
588	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
589	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
590	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
591											
592	The data set for variable Hg was not processed!										
593											
594											
595	Mo										
596											
597	General Statistics										
598				Total Number of Observations	45				Number of Distinct Observations		40
599				Minimum	0.0192				First Quartile		0.043
600				Second Largest	0.18				Median		0.0653
601				Maximum	0.18				Third Quartile		0.135
602				Mean	0.0845				SD		0.0509
603				Coefficient of Variation	0.602				Skewness		0.483
604				Mean of logged Data	-2.669				SD of logged Data		0.66
605											
606	Critical Values for Background Threshold Values (BTVs)										
607				Tolerance Factor K (For UTL)	2.085				d2max (for USL)		2.915
608											
609	Normal GOF Test										
610				Shapiro Wilk Test Statistic	0.878				Shapiro Wilk GOF Test		
611				5% Shapiro Wilk Critical Value	0.945				Data Not Normal at 5% Significance Level		
612				Lilliefors Test Statistic	0.186				Lilliefors GOF Test		
613				5% Lilliefors Critical Value	0.131				Data Not Normal at 5% Significance Level		
614	Data Not Normal at 5% Significance Level										
615											
616	Background Statistics Assuming Normal Distribution										
617				95% UTL with 95% Coverage	0.191				90% Percentile (z)		0.15
618				95% UPL (t)	0.171				95% Percentile (z)		0.168
619				95% USL	0.233				99% Percentile (z)		0.203
620											
621	Gamma GOF Test										
622				A-D Test Statistic	1.166				Anderson-Darling Gamma GOF Test		
623				5% A-D Critical Value	0.757				Data Not Gamma Distributed at 5% Significance Level		
624				K-S Test Statistic	0.142				Kolmogorov-Smirnov Gamma GOF Test		
625				5% K-S Critical Value	0.133				Data Not Gamma Distributed at 5% Significance Level		
626	Data Not Gamma Distributed at 5% Significance Level										
627											
628	Gamma Statistics										
629				k hat (MLE)	2.678				k star (bias corrected MLE)		2.514
630				Theta hat (MLE)	0.0316				Theta star (bias corrected MLE)		0.0336
631				nu hat (MLE)	241				nu star (bias corrected)		226.3
632				MLE Mean (bias corrected)	0.0845				MLE Sd (bias corrected)		0.0533
633											
634	Background Statistics Assuming Gamma Distribution										
635				95% Wilson Hilferty (WH) Approx. Gamma UPL	0.189				90% Percentile		0.156
636				95% Hawkins Wixley (HW) Approx. Gamma UPL	0.194				95% Percentile		0.187

	A	B	C	D	E	F	G	H	I	J	K	L
637	95% WH Approx. Gamma UTL with 95% Coverage					0.226	99% Percentile					0.254
638	95% HW Approx. Gamma UTL with 95% Coverage					0.235						
639	95% WH USL					0.321	95% HW USL					0.345
640												
641	Lognormal GOF Test											
642	Shapiro Wilk Test Statistic					0.924	Shapiro Wilk Lognormal GOF Test					
643	5% Shapiro Wilk Critical Value					0.945	Data Not Lognormal at 5% Significance Level					
644	Lilliefors Test Statistic					0.145	Lilliefors Lognormal GOF Test					
645	5% Lilliefors Critical Value					0.131	Data Not Lognormal at 5% Significance Level					
646	Data Not Lognormal at 5% Significance Level											
647												
648	Background Statistics assuming Lognormal Distribution											
649	95% UTL with 95% Coverage					0.275	90% Percentile (z)					0.162
650	95% UPL (t)					0.213	95% Percentile (z)					0.205
651	95% USL					0.475	99% Percentile (z)					0.322
652												
653	Nonparametric Distribution Free Background Statistics											
654	Data do not follow a Discernible Distribution (0.05)											
655												
656	Nonparametric Upper Limits for Background Threshold Values											
657	Order of Statistic, r					44	95% UTL with 95% Coverage					0.18
658	Approx, f used to compute achieved CC					1.158	pproximate Actual Confidence Coefficient achieved by UTL					0.665
659							Approximate Sample Size needed to achieve specified CC					93
660	95% Percentile Bootstrap UTL with 95% Coverage					0.18	95% BCA Bootstrap UTL with 95% Coverage					0.18
661	95% UPL					0.177	90% Percentile					0.15
662	90% Chebyshev UPL					0.239	95% Percentile					0.17
663	95% Chebyshev UPL					0.309	99% Percentile					0.18
664	95% USL					0.18						
665												
666	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
667	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
668	and consists of observations collected from clean unimpacted locations.											
669	The use of USL tends to provide a balance between false positives and false negatives provided the data											
670	represents a background data set and when many onsite observations need to be compared with the BTV.											
671												
672	Ra											
673												
674	General Statistics											
675	Total Number of Observations					45	Number of Missing Observations					0
676	Number of Distinct Observations					43						
677	Number of Detects					19	Number of Non-Detects					26
678	Number of Distinct Detects					19	Number of Distinct Non-Detects					25
679	Minimum Detect					0.373	Minimum Non-Detect					0.315
680	Maximum Detect					1.02	Maximum Non-Detect					0.855
681	Variance Detected					0.0444	Percent Non-Detects					57.78%
682	Mean Detected					0.64	SD Detected					0.211
683	Mean of Detected Logged Data					-0.495	SD of Detected Logged Data					0.316
684												
685	Critical Values for Background Threshold Values (BTVs)											
686	Tolerance Factor K (For UTL)					2.085	d2max (for USL)					2.915
687												
688	Normal GOF Test on Detects Only											
689	Shapiro Wilk Test Statistic					0.881	Shapiro Wilk GOF Test					

690			5% Shapiro Wilk Critical Value		0.901	Data Not Normal at 5% Significance Level					
691			Lilliefors Test Statistic		0.19	Lilliefors GOF Test					
692			5% Lilliefors Critical Value		0.197	Detected Data appear Normal at 5% Significance Level					
693	Detected Data appear Approximate Normal at 5% Significance Level										
694											
695	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
696			KM Mean		0.473	KM SD					0.202
697			95% UTL95% Coverage		0.893	95% KM UPL (t)					0.815
698			90% KM Percentile (z)		0.731	95% KM Percentile (z)					0.804
699			99% KM Percentile (z)		0.942	95% KM USL					1.06
700											
701	DL/2 Substitution Background Statistics Assuming Normal Distribution										
702			Mean		0.41	SD					0.245
703			95% UTL95% Coverage		0.921	95% UPL (t)					0.826
704			90% Percentile (z)		0.724	95% Percentile (z)					0.813
705			99% Percentile (z)		0.98	95% USL					1.124
706	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
707											
708	Gamma GOF Tests on Detected Observations Only										
709			A-D Test Statistic		0.651	Anderson-Darling GOF Test					
710			5% A-D Critical Value		0.741	Detected data appear Gamma Distributed at 5% Significance Level					
711			K-S Test Statistic		0.154	Kolmogorov-Smirnov GOF					
712			5% K-S Critical Value		0.199	Detected data appear Gamma Distributed at 5% Significance Level					
713	Detected data appear Gamma Distributed at 5% Significance Level										
714											
715	Gamma Statistics on Detected Data Only										
716			k hat (MLE)		10.5	k star (bias corrected MLE)					8.879
717			Theta hat (MLE)		0.0609	Theta star (bias corrected MLE)					0.0721
718			nu hat (MLE)		399.1	nu star (bias corrected)					337.4
719			MLE Mean (bias corrected)		0.64						
720			MLE Sd (bias corrected)		0.215	95% Percentile of Chisquare (2kstar)					28.56
721											
722	Gamma ROS Statistics using Imputed Non-Detects										
723	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs										
724	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)										
725	For such situations, GROS method may yield incorrect values of UCLs and BTVs										
726	This is especially true when the sample size is small.										
727	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates										
728			Minimum		0.128	Mean					0.409
729			Maximum		1.02	Median					0.312
730			SD		0.245	CV					0.598
731			k hat (MLE)		3.355	k star (bias corrected MLE)					3.146
732			Theta hat (MLE)		0.122	Theta star (bias corrected MLE)					0.13
733			nu hat (MLE)		302	nu star (bias corrected)					283.2
734			MLE Mean (bias corrected)		0.409	MLE Sd (bias corrected)					0.231
735			95% Percentile of Chisquare (2kstar)		13.03	90% Percentile					0.719
736			95% Percentile		0.847	99% Percentile					1.125
737	The following statistics are computed using Gamma ROS Statistics on Imputed Data										
738	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
739				WH	HW					WH	HW
740	95% Approx. Gamma UTL with 95% Coverage			1.006	1.027	95% Approx. Gamma UPL				0.855	0.864
741			95% Gamma USL	1.388	1.455						
742											

	A	B	C	D	E	F	G	H	I	J	K	L
743	Estimates of Gamma Parameters using KM Estimates											
744					Mean (KM)	0.473				SD (KM)		0.202
745					Variance (KM)	0.0406				SE of Mean (KM)		0.0321
746					k hat (KM)	5.503				k star (KM)		5.151
747					nu hat (KM)	495.3				nu star (KM)		463.6
748					theta hat (KM)	0.0859				theta star (KM)		0.0918
749					80% gamma percentile (KM)	0.634				90% gamma percentile (KM)		0.752
750					95% gamma percentile (KM)	0.859				99% gamma percentile (KM)		1.086
751												
752	The following statistics are computed using gamma distribution and KM estimates											
753	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
754					WH	HW					WH	HW
755	95% Approx. Gamma UTL with 95% Coverage				0.916	0.921	95% Approx. Gamma UPL				0.812	0.813
756	95% KM Gamma Percentile				0.799	0.799	95% Gamma USL				1.166	1.188
757												
758	Lognormal GOF Test on Detected Observations Only											
759					Shapiro Wilk Test Statistic	0.93	Shapiro Wilk GOF Test					
760					5% Shapiro Wilk Critical Value	0.901	Detected Data appear Lognormal at 5% Significance Level					
761					Lilliefors Test Statistic	0.133	Lilliefors GOF Test					
762					5% Lilliefors Critical Value	0.197	Detected Data appear Lognormal at 5% Significance Level					
763	Detected Data appear Lognormal at 5% Significance Level											
764												
765	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
766					Mean in Original Scale	0.449				Mean in Log Scale		-0.892
767					SD in Original Scale	0.215				SD in Log Scale		0.408
768					95% UTL95% Coverage	0.96				95% BCA UTL95% Coverage		1.018
769					95% Bootstrap (%) UTL95% Coverage	1.018				95% UPL (t)		0.82
770					90% Percentile (z)	0.692				95% Percentile (z)		0.802
771					99% Percentile (z)	1.06				95% USL		1.348
772												
773	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
774					KM Mean of Logged Data	-0.822				95% KM UTL (Lognormal)95% Coverage		0.939
775					KM SD of Logged Data	0.364				95% KM UPL (Lognormal)		0.816
776					95% KM Percentile Lognormal (z)	0.8				95% KM USL (Lognormal)		1.271
777												
778	Background DL/2 Statistics Assuming Lognormal Distribution											
779					Mean in Original Scale	0.41				Mean in Log Scale		-1.045
780					SD in Original Scale	0.245				SD in Log Scale		0.55
781					95% UTL95% Coverage	1.108				95% UPL (t)		0.896
782					90% Percentile (z)	0.712				95% Percentile (z)		0.869
783					99% Percentile (z)	1.265				95% USL		1.749
784	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
785												
786	Nonparametric Distribution Free Background Statistics											
787	Data appear to follow a Discernible Distribution at 5% Significance Level											
788												
789	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
790					Order of Statistic, r	44				95% UTL with95% Coverage		1.01
791					Approx, f used to compute achieved CC	1.158	pproximate Actual Confidence Coefficient achieved by UTL					0.665
792	Approximate Sample Size needed to achieve specified CC					93				95% UPL		0.998
793					95% USL	1.02				95% KM Chebyshev UPL		1.361
794												
795	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											

796	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
797	and consists of observations collected from clean unimpacted locations.										
798	The use of USL tends to provide a balance between false positives and false negatives provided the data										
799	represents a background data set and when many onsite observations need to be compared with the BTV.										
800											
801	Se										
802											
803	General Statistics										
804					Total Number of Observations	45			Number of Missing Observations	0	
805					Number of Distinct Observations	22					
806					Number of Detects	23			Number of Non-Detects	22	
807					Number of Distinct Detects	20			Number of Distinct Non-Detects	2	
808					Minimum Detect	0.0055			Minimum Non-Detect	0.005	
809					Maximum Detect	0.0161			Maximum Non-Detect	0.05	
810					Variance Detected	7.6042E-6			Percent Non-Detects	48.89%	
811					Mean Detected	0.00903			SD Detected	0.00276	
812					Mean of Detected Logged Data	-4.75			SD of Detected Logged Data	0.301	
813											
814	Critical Values for Background Threshold Values (BTVs)										
815					Tolerance Factor K (For UTL)	2.085			d2max (for USL)	2.915	
816											
817	Normal GOF Test on Detects Only										
818					Shapiro Wilk Test Statistic	0.924			Shapiro Wilk GOF Test		
819					5% Shapiro Wilk Critical Value	0.914			Detected Data appear Normal at 5% Significance Level		
820					Lilliefors Test Statistic	0.145			Lilliefors GOF Test		
821					5% Lilliefors Critical Value	0.18			Detected Data appear Normal at 5% Significance Level		
822	Detected Data appear Normal at 5% Significance Level										
823											
824	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
825					KM Mean	0.00721			KM SD	0.00283	
826					95% UTL95% Coverage	0.0131			95% KM UPL (t)	0.012	
827					90% KM Percentile (z)	0.0108			95% KM Percentile (z)	0.0119	
828					99% KM Percentile (z)	0.0138			95% KM USL	0.0155	
829											
830	DL/2 Substitution Background Statistics Assuming Normal Distribution										
831					Mean	0.00734			SD	0.00606	
832					95% UTL95% Coverage	0.02			95% UPL (t)	0.0176	
833					90% Percentile (z)	0.0151			95% Percentile (z)	0.0173	
834					99% Percentile (z)	0.0214			95% USL	0.025	
835	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
836											
837	Gamma GOF Tests on Detected Observations Only										
838					A-D Test Statistic	0.583			Anderson-Darling GOF Test		
839					5% A-D Critical Value	0.744			Detected data appear Gamma Distributed at 5% Significance Level		
840					K-S Test Statistic	0.141			Kolmogorov-Smirnov GOF		
841					5% K-S Critical Value	0.181			Detected data appear Gamma Distributed at 5% Significance Level		
842	Detected data appear Gamma Distributed at 5% Significance Level										
843											
844	Gamma Statistics on Detected Data Only										
845					k hat (MLE)	11.63			k star (bias corrected MLE)	10.15	
846					Theta hat (MLE)	7.7654E-4			Theta star (bias corrected MLE)	8.9046E-4	
847					nu hat (MLE)	535.2			nu star (bias corrected)	466.7	
848					MLE Mean (bias corrected)	0.00903					

849				MLE Sd (bias corrected)	0.00284			95% Percentile of Chisquare (2kstar)		31.78	
850											
851				Gamma ROS Statistics using Imputed Non-Detects							
852				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
853				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
854				For such situations, GROS method may yield incorrect values of UCLs and BTVs							
855				This is especially true when the sample size is small.							
856				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
857				Minimum	0.0055			Mean		0.00951	
858				Maximum	0.0161			Median		0.01	
859				SD	0.00201			CV		0.211	
860				k hat (MLE)	21.38			k star (bias corrected MLE)		19.97	
861				Theta hat (MLE)	4.4462E-4			Theta star (bias corrected MLE)		4.7603E-4	
862				nu hat (MLE)	1924			nu star (bias corrected)		1797	
863				MLE Mean (bias corrected)	0.00951			MLE Sd (bias corrected)		0.00213	
864				95% Percentile of Chisquare (2kstar)	55.69			90% Percentile		0.0123	
865				95% Percentile	0.0133			99% Percentile		0.0151	
866				The following statistics are computed using Gamma ROS Statistics on Imputed Data							
867				Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
868					WH	HW				WH	HW
869				95% Approx. Gamma UTL with 95% Coverage	0.0143	0.0145		95% Approx. Gamma UPL		0.0133	0.0134
870				95% Gamma USL	0.0167	0.017					
871											
872				Estimates of Gamma Parameters using KM Estimates							
873				Mean (KM)	0.00721			SD (KM)		0.00283	
874				Variance (KM)	8.0161E-6			SE of Mean (KM)		4.4669E-4	
875				k hat (KM)	6.484			k star (KM)		6.067	
876				nu hat (KM)	583.6			nu star (KM)		546	
877				theta hat (KM)	0.00111			theta star (KM)		0.00119	
878				80% gamma percentile (KM)	0.00949			90% gamma percentile (KM)		0.0111	
879				95% gamma percentile (KM)	0.0126			99% gamma percentile (KM)		0.0157	
880											
881				The following statistics are computed using gamma distribution and KM estimates							
882				Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
883					WH	HW				WH	HW
884				95% Approx. Gamma UTL with 95% Coverage	0.0136	0.0137		95% Approx. Gamma UPL		0.0121	0.0121
885				95% KM Gamma Percentile	0.0119	0.0119		95% Gamma USL		0.0171	0.0174
886											
887				Lognormal GOF Test on Detected Observations Only							
888				Shapiro Wilk Test Statistic	0.941			Shapiro Wilk GOF Test			
889				5% Shapiro Wilk Critical Value	0.914			Detected Data appear Lognormal at 5% Significance Level			
890				Lilliefors Test Statistic	0.135			Lilliefors GOF Test			
891				5% Lilliefors Critical Value	0.18			Detected Data appear Lognormal at 5% Significance Level			
892				Detected Data appear Lognormal at 5% Significance Level							
893											
894				Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects							
895				Mean in Original Scale	0.00674			Mean in Log Scale		-5.11	
896				SD in Original Scale	0.00322			SD in Log Scale		0.479	
897				95% UTL95% Coverage	0.0164			95% BCA UTL95% Coverage		0.0153	
898				95% Bootstrap (%) UTL95% Coverage	0.0154			95% UPL (t)		0.0136	
899				90% Percentile (z)	0.0112			95% Percentile (z)		0.0133	
900				99% Percentile (z)	0.0184			95% USL		0.0244	
901											

902	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
903	KM Mean of Logged Data				-4.998	95% KM UTL (Lognormal)95% Coverage					0.014
904	KM SD of Logged Data				0.349	95% KM UPL (Lognormal)					0.0122
905	95% KM Percentile Lognormal (z)				0.012	95% KM USL (Lognormal)					0.0187
906											
907	Background DL/2 Statistics Assuming Lognormal Distribution										
908	Mean in Original Scale				0.00734	Mean in Log Scale					-5.204
909	SD in Original Scale				0.00606	SD in Log Scale					0.76
910	95% UTL95% Coverage				0.0268	95% UPL (t)					0.02
911	90% Percentile (z)				0.0146	95% Percentile (z)					0.0192
912	99% Percentile (z)				0.0322	95% USL					0.0504
913	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
914											
915	Nonparametric Distribution Free Background Statistics										
916	Data appear to follow a Discernible Distribution at 5% Significance Level										
917											
918	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
919	Order of Statistic, r				44	95% UTL with95% Coverage					0.05
920	Approx, f used to compute achieved CC				1.158	pproximate Actual Confidence Coefficient achieved by UTL					0.665
921	Approximate Sample Size needed to achieve specified CC				93	95% UPL					0.05
922	95% USL				0.05	95% KM Chebyshev UPL					0.0197
923											
924	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
925	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
926	and consists of observations collected from clean unimpacted locations.										
927	The use of USL tends to provide a balance between false positives and false negatives provided the data										
928	represents a background data set and when many onsite observations need to be compared with the BTV.										
929											
930	Th										
931											
932	General Statistics										
933	Total Number of Observations				44	Number of Missing Observations					0
934	Number of Distinct Observations				2						
935	Number of Detects				0	Number of Non-Detects					44
936	Number of Distinct Detects				0	Number of Distinct Non-Detects					2
937	Minimum Detect				N/A	Minimum Non-Detect					0.001
938	Maximum Detect				N/A	Maximum Non-Detect					0.01
939	Variance Detected				N/A	Percent Non-Detects					100%
940	Mean Detected				N/A	SD Detected					N/A
941	Mean of Detected Logged Data				N/A	SD of Detected Logged Data					N/A
942											
943	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
944	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
945	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
946											
947	The data set for variable Th was not processed!										
948											
949											

	Background Statistics for Data Sets with Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/13/2022 8:27:37 AM	
From File	LRS_ProUCL_UPL_Input_2021_v1.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Coverage	95%	
Different or Future K Observations	1	
Number of Bootstrap Operations	2000	

B

General Statistics			
Total Number of Observations	32	Number of Missing Observations	2
Number of Distinct Observations	16		
Number of Detects	21	Number of Non-Detects	11
Number of Distinct Detects	15	Number of Distinct Non-Detects	1
Minimum Detect	0.104	Minimum Non-Detect	0.1
Maximum Detect	0.187	Maximum Non-Detect	0.1
Variance Detected	5.3729E-4	Percent Non-Detects	34.38%
Mean Detected	0.148	SD Detected	0.0232
Mean of Detected Logged Data	-1.924	SD of Detected Logged Data	0.169

Critical Values for Background Threshold Values (BTVs)			
Tolerance Factor K (For UTL)	2.186	d2max (for USL)	2.773

Normal GOF Test on Detects Only		
Shapiro Wilk Test Statistic	0.879	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.908	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.281	Lilliefors GOF Test
5% Lilliefors Critical Value	0.188	Data Not Normal at 5% Significance Level
Data Not Normal at 5% Significance Level		

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution			
KM Mean	0.131	KM SD	0.0292
95% UTL95% Coverage	0.195	95% KM UPL (t)	0.182
90% KM Percentile (z)	0.169	95% KM Percentile (z)	0.179
99% KM Percentile (z)	0.199	95% KM USL	0.212

DL/2 Substitution Background Statistics Assuming Normal Distribution			
Mean	0.114	SD	0.0508
95% UTL95% Coverage	0.225	95% UPL (t)	0.202
90% Percentile (z)	0.179	95% Percentile (z)	0.198
99% Percentile (z)	0.232	95% USL	0.255
DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons			

Gamma GOF Tests on Detected Observations Only		
A-D Test Statistic	1.509	Anderson-Darling GOF Test
5% A-D Critical Value	0.742	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.302	Kolmogorov-Smirnov GOF
5% K-S Critical Value	0.189	Data Not Gamma Distributed at 5% Significance Level
Data Not Gamma Distributed at 5% Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
54	Gamma Statistics on Detected Data Only											
55					k hat (MLE)	38.95			k star (bias corrected MLE)			33.42
56					Theta hat (MLE)	0.0038			Theta star (bias corrected MLE)			0.00443
57					nu hat (MLE)	1636			nu star (bias corrected)			1403
58					MLE Mean (bias corrected)	0.148						
59					MLE Sd (bias corrected)	0.0256			95% Percentile of Chisquare (2kstar)			86.91
60												
61	Gamma ROS Statistics using Imputed Non-Detects											
62	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
63	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
64	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
65	This is especially true when the sample size is small.											
66	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
67					Minimum	0.0773			Mean			0.132
68					Maximum	0.187			Median			0.133
69					SD	0.0303			CV			0.23
70					k hat (MLE)	18.65			k star (bias corrected MLE)			16.92
71					Theta hat (MLE)	0.00706			Theta star (bias corrected MLE)			0.00778
72					nu hat (MLE)	1194			nu star (bias corrected)			1083
73					MLE Mean (bias corrected)	0.132			MLE Sd (bias corrected)			0.032
74					95% Percentile of Chisquare (2kstar)	48.42			90% Percentile			0.174
75					95% Percentile	0.188			99% Percentile			0.217
76	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
77	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
78					WH	HW					WH	HW
79				95% Approx. Gamma UTL with 95% Coverage	0.208	0.21			95% Approx. Gamma UPL		0.189	0.19
80				95% Gamma USL	0.234	0.237						
81												
82	Estimates of Gamma Parameters using KM Estimates											
83					Mean (KM)	0.131			SD (KM)			0.0292
84					Variance (KM)	8.5350E-4			SE of Mean (KM)			0.00529
85					k hat (KM)	20.24			k star (KM)			18.36
86					nu hat (KM)	1295			nu star (KM)			1175
87					theta hat (KM)	0.00649			theta star (KM)			0.00716
88					80% gamma percentile (KM)	0.156			90% gamma percentile (KM)			0.172
89					95% gamma percentile (KM)	0.186			99% gamma percentile (KM)			0.213
90												
91	The following statistics are computed using gamma distribution and KM estimates											
92	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
93					WH	HW					WH	HW
94				95% Approx. Gamma UTL with 95% Coverage	0.203	0.205			95% Approx. Gamma UPL		0.186	0.186
95				95% KM Gamma Percentile	0.183	0.184			95% Gamma USL		0.227	0.23
96												
97	Lognormal GOF Test on Detected Observations Only											
98					Shapiro Wilk Test Statistic	0.845			Shapiro Wilk GOF Test			
99					5% Shapiro Wilk Critical Value	0.908			Data Not Lognormal at 5% Significance Level			
100					Lilliefors Test Statistic	0.31			Lilliefors GOF Test			
101					5% Lilliefors Critical Value	0.188			Data Not Lognormal at 5% Significance Level			
102	Data Not Lognormal at 5% Significance Level											
103												
104	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
105					Mean in Original Scale	0.132			Mean in Log Scale			-2.052
106					SD in Original Scale	0.0298			SD in Log Scale			0.232

107				95% UTL95% Coverage	0.214			95% BCA UTL95% Coverage			0.187
108				95% Bootstrap (%) UTL95% Coverage	0.187			95% UPL (t)			0.192
109				90% Percentile (z)	0.173			95% Percentile (z)			0.188
110				99% Percentile (z)	0.221			95% USL			0.245
111											
112				Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution							
113				KM Mean of Logged Data	-2.054			95% KM UTL (Lognormal)95% Coverage			0.209
114				KM SD of Logged Data	0.224			95% KM UPL (Lognormal)			0.188
115				95% KM Percentile Lognormal (z)	0.185			95% KM USL (Lognormal)			0.239
116											
117				Background DL/2 Statistics Assuming Lognormal Distribution							
118				Mean in Original Scale	0.114			Mean in Log Scale			-2.292
119				SD in Original Scale	0.0508			SD in Log Scale			0.535
120				95% UTL95% Coverage	0.325			95% UPL (t)			0.254
121				90% Percentile (z)	0.2			95% Percentile (z)			0.243
122				99% Percentile (z)	0.35			95% USL			0.445
123				DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.							
124											
125				Nonparametric Distribution Free Background Statistics							
126				Data do not follow a Discernible Distribution (0.05)							
127											
128				Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)							
129				Order of Statistic, r	32			95% UTL with95% Coverage			0.187
130				Approx, f used to compute achieved CC	1.684			pproximate Actual Confidence Coefficient achieved by UTL			0.806
131				Approximate Sample Size needed to achieve specified CC	59			95% UPL			0.179
132				95% USL	0.187			95% KM Chebyshev UPL			0.261
133											
134				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
135				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
136				and consists of observations collected from clean unimpacted locations.							
137				The use of USL tends to provide a balance between false positives and false negatives provided the data							
138				represents a background data set and when many onsite observations need to be compared with the BTV.							
139											
140	Ca										
141											
142	General Statistics										
143				Total Number of Observations	32			Number of Distinct Observations			25
144								Number of Missing Observations			2
145				Minimum	76			First Quartile			97.1
146				Second Largest	174			Median			112
147				Maximum	175			Third Quartile			158.3
148				Mean	120.6			SD			33.87
149				Coefficient of Variation	0.281			Skewness			0.262
150				Mean of logged Data	4.753			SD of logged Data			0.284
151											
152				Critical Values for Background Threshold Values (BTVs)							
153				Tolerance Factor K (For UTL)	2.186			d2max (for USL)			2.773
154											
155				Normal GOF Test							
156				Shapiro Wilk Test Statistic	0.894			Shapiro Wilk GOF Test			
157				5% Shapiro Wilk Critical Value	0.93			Data Not Normal at 5% Significance Level			
158				Lilliefors Test Statistic	0.188			Lilliefors GOF Test			
159				5% Lilliefors Critical Value	0.154			Data Not Normal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
160	Data Not Normal at 5% Significance Level											
161												
162	Background Statistics Assuming Normal Distribution											
163			95% UTL with	95% Coverage	194.6				90% Percentile (z)	164		
164				95% UPL (t)	178.9				95% Percentile (z)	176.3		
165				95% USL	214.5				99% Percentile (z)	199.4		
166												
167	Gamma GOF Test											
168				A-D Test Statistic	0.962		Anderson-Darling Gamma GOF Test					
169				5% A-D Critical Value	0.746		Data Not Gamma Distributed at 5% Significance Level					
170				K-S Test Statistic	0.166		Kolmogorov-Smirnov Gamma GOF Test					
171				5% K-S Critical Value	0.155		Data Not Gamma Distributed at 5% Significance Level					
172	Data Not Gamma Distributed at 5% Significance Level											
173												
174	Gamma Statistics											
175				k hat (MLE)	13.04				k star (bias corrected MLE)	11.84		
176				Theta hat (MLE)	9.243				Theta star (bias corrected MLE)	10.18		
177				nu hat (MLE)	834.9				nu star (bias corrected)	757.9		
178				MLE Mean (bias corrected)	120.6				MLE Sd (bias corrected)	35.04		
179												
180	Background Statistics Assuming Gamma Distribution											
181			95% Wilson Hilferty (WH) Approx. Gamma UPL		184.8				90% Percentile	167.1		
182			95% Hawkins Wixley (HW) Approx. Gamma UPL		185.8				95% Percentile	183.4		
183			95% WH Approx. Gamma UTL with	95% Coverage	206.6				99% Percentile	216.7		
184			95% HW Approx. Gamma UTL with	95% Coverage	208.7							
185				95% WH USL	236.5				95% HW USL	240.5		
186												
187	Lognormal GOF Test											
188				Shapiro Wilk Test Statistic	0.903		Shapiro Wilk Lognormal GOF Test					
189				5% Shapiro Wilk Critical Value	0.93		Data Not Lognormal at 5% Significance Level					
190				Lilliefors Test Statistic	0.149		Lilliefors Lognormal GOF Test					
191				5% Lilliefors Critical Value	0.154		Data appear Lognormal at 5% Significance Level					
192	Data appear Approximate Lognormal at 5% Significance Level											
193												
194	Background Statistics assuming Lognormal Distribution											
195			95% UTL with	95% Coverage	216				90% Percentile (z)	167		
196				95% UPL (t)	189.3				95% Percentile (z)	185.2		
197				95% USL	255.3				99% Percentile (z)	224.8		
198												
199	Nonparametric Distribution Free Background Statistics											
200	Data appear Approximate Lognormal at 5% Significance Level											
201												
202	Nonparametric Upper Limits for Background Threshold Values											
203				Order of Statistic, r	32				95% UTL with	95% Coverage	175	
204				Approx, f used to compute achieved CC	1.684				pproximate Actual Confidence Coefficient achieved by UTL		0.806	
205									Approximate Sample Size needed to achieve specified CC		59	
206			95% Percentile Bootstrap UTL with	95% Coverage	175				95% BCA Bootstrap UTL with	95% Coverage	175	
207				95% UPL	174.4				90% Percentile	167.9		
208				90% Chebyshev UPL	223.8				95% Percentile	171.3		
209				95% Chebyshev UPL	270.5				99% Percentile	174.7		
210				95% USL	175							
211												
212	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											

	A	B	C	D	E	F	G	H	I	J	K	L
213	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
214	and consists of observations collected from clean unimpacted locations.											
215	The use of USL tends to provide a balance between false positives and false negatives provided the data											
216	represents a background data set and when many onsite observations need to be compared with the BTV.											
217												
218	CI											
219												
220	General Statistics											
221					Total Number of Observations	32			Number of Distinct Observations	23		
222									Number of Missing Observations	2		
223					Minimum	32			First Quartile	33.75		
224					Second Largest	51.1			Median	40.85		
225					Maximum	52.7			Third Quartile	42.28		
226					Mean	39.9			SD	5.786		
227					Coefficient of Variation	0.145			Skewness	0.366		
228					Mean of logged Data	3.676			SD of logged Data	0.144		
229												
230	Critical Values for Background Threshold Values (BTVs)											
231					Tolerance Factor K (For UTL)	2.186			d2max (for USL)	2.773		
232												
233	Normal GOF Test											
234					Shapiro Wilk Test Statistic	0.919			Shapiro Wilk GOF Test			
235					5% Shapiro Wilk Critical Value	0.93			Data Not Normal at 5% Significance Level			
236					Lilliefors Test Statistic	0.133			Lilliefors GOF Test			
237					5% Lilliefors Critical Value	0.154			Data appear Normal at 5% Significance Level			
238	Data appear Approximate Normal at 5% Significance Level											
239												
240	Background Statistics Assuming Normal Distribution											
241				95% UTL with	95% Coverage	52.55			90% Percentile (z)	47.32		
242					95% UPL (t)	49.86			95% Percentile (z)	49.42		
243					95% USL	55.95			99% Percentile (z)	53.36		
244												
245	Gamma GOF Test											
246					A-D Test Statistic	0.949			Anderson-Darling Gamma GOF Test			
247					5% A-D Critical Value	0.744			Data Not Gamma Distributed at 5% Significance Level			
248					K-S Test Statistic	0.144			Kolmogorov-Smirnov Gamma GOF Test			
249					5% K-S Critical Value	0.155			Detected data appear Gamma Distributed at 5% Significance Level			
250	Detected data follow Appr. Gamma Distribution at 5% Significance Level											
251												
252	Gamma Statistics											
253					k hat (MLE)	49.78			k star (bias corrected MLE)	45.14		
254					Theta hat (MLE)	0.801			Theta star (bias corrected MLE)	0.884		
255					nu hat (MLE)	3186			nu star (bias corrected)	2889		
256					MLE Mean (bias corrected)	39.9			MLE Sd (bias corrected)	5.939		
257												
258	Background Statistics Assuming Gamma Distribution											
259					95% Wilson Hilferty (WH) Approx. Gamma UPL	50.32			90% Percentile	47.68		
260					95% Hawkins Wixley (HW) Approx. Gamma UPL	50.39			95% Percentile	50.14		
261				95% WH Approx. Gamma UTL with	95% Coverage	53.5			99% Percentile	55		
262				95% HW Approx. Gamma UTL with	95% Coverage	53.64						
263					95% WH USL	57.71			95% HW USL	57.98		
264												
265	Lognormal GOF Test											

266				Shapiro Wilk Test Statistic	0.919	Shapiro Wilk Lognormal GOF Test					
267				5% Shapiro Wilk Critical Value	0.93	Data Not Lognormal at 5% Significance Level					
268				Lilliefors Test Statistic	0.144	Lilliefors Lognormal GOF Test					
269				5% Lilliefors Critical Value	0.154	Data appear Lognormal at 5% Significance Level					
270	Data appear Approximate Lognormal at 5% Significance Level										
271											
272	Background Statistics assuming Lognormal Distribution										
273			95% UTL with	95% Coverage	54.12			90% Percentile (z)	47.51		
274				95% UPL (t)	50.62			95% Percentile (z)	50.06		
275				95% USL	58.89			99% Percentile (z)	55.22		
276											
277	Nonparametric Distribution Free Background Statistics										
278	Data appear Approximate Normal at 5% Significance Level										
279											
280	Nonparametric Upper Limits for Background Threshold Values										
281				Order of Statistic, r	32			95% UTL with	95% Coverage	52.7	
282				Approx, f used to compute achieved CC	1.684			pproximate Actual Confidence Coefficient achieved by UTL		0.806	
283								Approximate Sample Size needed to achieve specified CC		59	
284			95% Percentile Bootstrap UTL with	95% Coverage	52.7			95% BCA Bootstrap UTL with	95% Coverage	52.7	
285				95% UPL	51.66			90% Percentile		47.63	
286				90% Chebyshev UPL	57.53			95% Percentile		50	
287				95% Chebyshev UPL	65.51			99% Percentile		52.2	
288				95% USL	52.7						
289											
290	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
291	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
292	and consists of observations collected from clean unimpacted locations.										
293	The use of USL tends to provide a balance between false positives and false negatives provided the data										
294	represents a background data set and when many onsite observations need to be compared with the BTV.										
295											
296	F										
297											
298	General Statistics										
299				Total Number of Observations	34			Number of Missing Observations		0	
300				Number of Distinct Observations	16						
301				Number of Detects	18			Number of Non-Detects		16	
302				Number of Distinct Detects	16			Number of Distinct Non-Detects		1	
303				Minimum Detect	0.5			Minimum Non-Detect		0.5	
304				Maximum Detect	1.33			Maximum Non-Detect		0.5	
305				Variance Detected	0.029			Percent Non-Detects		47.06%	
306				Mean Detected	0.996			SD Detected		0.17	
307				Mean of Detected Logged Data	-0.021			SD of Detected Logged Data		0.2	
308											
309	Critical Values for Background Threshold Values (BTVs)										
310				Tolerance Factor K (For UTL)	2.166			d2max (for USL)		2.799	
311											
312	Normal GOF Test on Detects Only										
313				Shapiro Wilk Test Statistic	0.886	Shapiro Wilk GOF Test					
314				5% Shapiro Wilk Critical Value	0.897	Data Not Normal at 5% Significance Level					
315				Lilliefors Test Statistic	0.196	Lilliefors GOF Test					
316				5% Lilliefors Critical Value	0.202	Detected Data appear Normal at 5% Significance Level					
317	Detected Data appear Approximate Normal at 5% Significance Level										
318											

	A	B	C	D	E	F	G	H	I	J	K	L
319	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
320					KM Mean	0.762				KM SD		0.275
321					95% UTL95% Coverage	1.359				95% KM UPL (t)		1.235
322					90% KM Percentile (z)	1.115				95% KM Percentile (z)		1.215
323					99% KM Percentile (z)	1.403				95% KM USL		1.533
324												
325	DL/2 Substitution Background Statistics Assuming Normal Distribution											
326					Mean	0.645				SD		0.397
327					95% UTL95% Coverage	1.505				95% UPL (t)		1.327
328					90% Percentile (z)	1.154				95% Percentile (z)		1.298
329					99% Percentile (z)	1.569				95% USL		1.757
330	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
331												
332	Gamma GOF Tests on Detected Observations Only											
333					A-D Test Statistic	1.02	Anderson-Darling GOF Test					
334					5% A-D Critical Value	0.739	Data Not Gamma Distributed at 5% Significance Level					
335					K-S Test Statistic	0.225	Kolmogorov-Smirnov GOF					
336					5% K-S Critical Value	0.203	Data Not Gamma Distributed at 5% Significance Level					
337	Data Not Gamma Distributed at 5% Significance Level											
338												
339	Gamma Statistics on Detected Data Only											
340					k hat (MLE)	29.96				k star (bias corrected MLE)		25.01
341					Theta hat (MLE)	0.0332				Theta star (bias corrected MLE)		0.0398
342					nu hat (MLE)	1079				nu star (bias corrected)		900.3
343					MLE Mean (bias corrected)	0.996						
344					MLE Sd (bias corrected)	0.199				95% Percentile of Chisquare (2kstar)		67.52
345												
346	Gamma ROS Statistics using Imputed Non-Detects											
347	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
348	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
349	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
350	This is especially true when the sample size is small.											
351	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
352					Minimum	0.392				Mean		0.82
353					Maximum	1.33				Median		0.826
354					SD	0.238				CV		0.29
355					k hat (MLE)	11.54				k star (bias corrected MLE)		10.54
356					Theta hat (MLE)	0.071				Theta star (bias corrected MLE)		0.0778
357					nu hat (MLE)	784.8				nu star (bias corrected)		716.9
358					MLE Mean (bias corrected)	0.82				MLE Sd (bias corrected)		0.252
359					95% Percentile of Chisquare (2kstar)	32.78				90% Percentile		1.155
360					95% Percentile	1.274				99% Percentile		1.518
361	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
362	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
363						WH	HW				WH	HW
364					95% Approx. Gamma UTL with 95% Coverage	1.439	1.458	95% Approx. Gamma UPL			1.284	1.295
365					95% Gamma USL	1.677	1.714					
366												
367	Estimates of Gamma Parameters using KM Estimates											
368					Mean (KM)	0.762				SD (KM)		0.275
369					Variance (KM)	0.0757				SE of Mean (KM)		0.0486
370					k hat (KM)	7.677				k star (KM)		7.019
371					nu hat (KM)	522				nu star (KM)		477.3

372				theta hat (KM)	0.0993				theta star (KM)			0.109
373				80% gamma percentile (KM)	0.988				90% gamma percentile (KM)			1.147
374				95% gamma percentile (KM)	1.289				99% gamma percentile (KM)			1.586
375												
376	The following statistics are computed using gamma distribution and KM estimates											
377	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
378					WH	HW					WH	HW
379	95% Approx. Gamma UTL with 95% Coverage				1.474	1.495			95% Approx. Gamma UPL		1.291	1.3
380	95% KM Gamma Percentile				1.263	1.271			95% Gamma USL		1.761	1.805
381												
382	Lognormal GOF Test on Detected Observations Only											
383	Shapiro Wilk Test Statistic				0.779	Shapiro Wilk GOF Test						
384	5% Shapiro Wilk Critical Value				0.897	Data Not Lognormal at 5% Significance Level						
385	Lilliefors Test Statistic				0.246	Lilliefors GOF Test						
386	5% Lilliefors Critical Value				0.202	Data Not Lognormal at 5% Significance Level						
387	Data Not Lognormal at 5% Significance Level											
388												
389	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
390	Mean in Original Scale				0.827	Mean in Log Scale						-0.228
391	SD in Original Scale				0.227	SD in Log Scale						0.283
392	95% UTL95% Coverage				1.471	95% BCA UTL95% Coverage						1.33
393	95% Bootstrap (%) UTL95% Coverage				1.33	95% UPL (t)						1.295
394	90% Percentile (z)				1.145	95% Percentile (z)						1.269
395	99% Percentile (z)				1.539	95% USL						1.76
396												
397	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
398	KM Mean of Logged Data				-0.337	95% KM UTL (Lognormal)95% Coverage						1.57
399	KM SD of Logged Data				0.364	95% KM UPL (Lognormal)						1.334
400	95% KM Percentile Lognormal (z)				1.299	95% KM USL (Lognormal)						1.978
401												
402	Background DL/2 Statistics Assuming Lognormal Distribution											
403	Mean in Original Scale				0.645	Mean in Log Scale						-0.663
404	SD in Original Scale				0.397	SD in Log Scale						0.706
405	95% UTL95% Coverage				2.38	95% UPL (t)						1.732
406	90% Percentile (z)				1.274	95% Percentile (z)						1.646
407	99% Percentile (z)				2.664	95% USL						3.722
408	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
409												
410	Nonparametric Distribution Free Background Statistics											
411	Data appear to follow a Discernible Distribution at 5% Significance Level											
412												
413	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
414	Order of Statistic, r				34	95% UTL with95% Coverage						1.33
415	Approx, f used to compute achieved CC				1.789	pproximate Actual Confidence Coefficient achieved by UTL						0.825
416	Approximate Sample Size needed to achieve specified CC				59	95% UPL						1.24
417	95% USL				1.33	95% KM Chebyshev UPL						1.98
418												
419	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
420	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
421	and consists of observations collected from clean unimpacted locations.											
422	The use of USL tends to provide a balance between false positives and false negatives provided the data											
423	represents a background data set and when many onsite observations need to be compared with the BTV.											
424												

425	pH										
426											
427	General Statistics										
428				Total Number of Observations		30			Number of Distinct Observations		25
429									Number of Missing Observations		4
430				Minimum		6.94			First Quartile		7.533
431				Second Largest		8.72			Median		7.64
432				Maximum		8.98			Third Quartile		7.805
433				Mean		7.758			SD		0.436
434				Coefficient of Variation		0.0561			Skewness		1.277
435				Mean of logged Data		2.047			SD of logged Data		0.0545
436											
437						Critical Values for Background Threshold Values (BTVs)						
438				Tolerance Factor K (For UTL)		2.22			d2max (for USL)		2.745
439											
440						Normal GOF Test					
441				Shapiro Wilk Test Statistic		0.86			Shapiro Wilk GOF Test		
442				5% Shapiro Wilk Critical Value		0.927			Data Not Normal at 5% Significance Level		
443				Lilliefors Test Statistic		0.219			Lilliefors GOF Test		
444				5% Lilliefors Critical Value		0.159			Data Not Normal at 5% Significance Level		
445						Data Not Normal at 5% Significance Level					
446											
447						Background Statistics Assuming Normal Distribution					
448				95% UTL with 95% Coverage		8.725			90% Percentile (z)		8.317
449				95% UPL (t)		8.511			95% Percentile (z)		8.475
450				95% USL		8.954			99% Percentile (z)		8.772
451											
452						Gamma GOF Test					
453				A-D Test Statistic		1.695			Anderson-Darling Gamma GOF Test		
454				5% A-D Critical Value		0.745			Data Not Gamma Distributed at 5% Significance Level		
455				K-S Test Statistic		0.211			Kolmogorov-Smirnov Gamma GOF Test		
456				5% K-S Critical Value		0.16			Data Not Gamma Distributed at 5% Significance Level		
457						Data Not Gamma Distributed at 5% Significance Level					
458											
459						Gamma Statistics					
460				k hat (MLE)		341.4			k star (bias corrected MLE)		307.3
461				Theta hat (MLE)		0.0227			Theta star (bias corrected MLE)		0.0252
462				nu hat (MLE)		20483			nu star (bias corrected)		18436
463				MLE Mean (bias corrected)		7.758			MLE Sd (bias corrected)		0.443
464											
465						Background Statistics Assuming Gamma Distribution					
466				95% Wilson Hilferty (WH) Approx. Gamma UPL		8.511			90% Percentile		8.331
467				95% Hawkins Wixley (HW) Approx. Gamma UPL		8.512			95% Percentile		8.5
468				95% WH Approx. Gamma UTL with 95% Coverage		8.737			99% Percentile		8.825
469				95% HW Approx. Gamma UTL with 95% Coverage		8.739					
470				95% WH USL		8.982			95% HW USL		8.986
471											
472						Lognormal GOF Test					
473				Shapiro Wilk Test Statistic		0.878			Shapiro Wilk Lognormal GOF Test		
474				5% Shapiro Wilk Critical Value		0.927			Data Not Lognormal at 5% Significance Level		
475				Lilliefors Test Statistic		0.208			Lilliefors Lognormal GOF Test		
476				5% Lilliefors Critical Value		0.159			Data Not Lognormal at 5% Significance Level		
477						Data Not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
478												
479	Background Statistics assuming Lognormal Distribution											
480					95% UTL with	95% Coverage	8.744			90% Percentile (z)		8.308
481					95% UPL (t)		8.512			95% Percentile (z)		8.474
482					95% USL		8.998			99% Percentile (z)		8.795
483												
484	Nonparametric Distribution Free Background Statistics											
485	Data do not follow a Discernible Distribution (0.05)											
486												
487	Nonparametric Upper Limits for Background Threshold Values											
488					Order of Statistic, r		30			95% UTL with	95% Coverage	8.98
489					Approx, f used to compute achieved CC		1.579			pproximate Actual Confidence Coefficient achieved by UTL		0.785
490										Approximate Sample Size needed to achieve specified CC		59
491			95% Percentile Bootstrap UTL with	95% Coverage			8.98			95% BCA Bootstrap UTL with	95% Coverage	8.98
492					95% UPL		8.837			90% Percentile		8.495
493					90% Chebyshev UPL		9.087			95% Percentile		8.68
494					95% Chebyshev UPL		9.688			99% Percentile		8.905
495					95% USL		8.98					
496												
497	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
498	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
499	and consists of observations collected from clean unimpacted locations.											
500	The use of USL tends to provide a balance between false positives and false negatives provided the data											
501	represents a background data set and when many onsite observations need to be compared with the BTV.											
502												
503	SO											
504												
505	General Statistics											
506					Total Number of Observations		32			Number of Distinct Observations		20
507										Number of Missing Observations		2
508					Minimum		208			First Quartile		220
509					Second Largest		499			Median		308.5
510					Maximum		923			Third Quartile		435
511					Mean		348.1			SD		154.5
512					Coefficient of Variation		0.444			Skewness		1.638
513					Mean of logged Data		5.771			SD of logged Data		0.4
514												
515	Critical Values for Background Threshold Values (BTVs)											
516					Tolerance Factor K (For UTL)		2.186			d2max (for USL)		2.773
517												
518	Normal GOF Test											
519					Shapiro Wilk Test Statistic		0.768			Shapiro Wilk GOF Test		
520					5% Shapiro Wilk Critical Value		0.93			Data Not Normal at 5% Significance Level		
521					Lilliefors Test Statistic		0.244			Lilliefors GOF Test		
522					5% Lilliefors Critical Value		0.154			Data Not Normal at 5% Significance Level		
523	Data Not Normal at 5% Significance Level											
524												
525	Background Statistics Assuming Normal Distribution											
526					95% UTL with	95% Coverage	685.8			90% Percentile (z)		546
527					95% UPL (t)		614			95% Percentile (z)		602.1
528					95% USL		776.4			99% Percentile (z)		707.4
529												
530	Gamma GOF Test											

	A	B	C	D	E	F	G	H	I	J	K	L
531					A-D Test Statistic	2.428	Anderson-Darling Gamma GOF Test					
532					5% A-D Critical Value	0.747	Data Not Gamma Distributed at 5% Significance Level					
533					K-S Test Statistic	0.251	Kolmogorov-Smirnov Gamma GOF Test					
534					5% K-S Critical Value	0.156	Data Not Gamma Distributed at 5% Significance Level					
535	Data Not Gamma Distributed at 5% Significance Level											
536												
537	Gamma Statistics											
538					k hat (MLE)	6.289	k star (bias corrected MLE)				5.72	
539					Theta hat (MLE)	55.35	Theta star (bias corrected MLE)				60.85	
540					nu hat (MLE)	402.5	nu star (bias corrected)				366.1	
541					MLE Mean (bias corrected)	348.1	MLE Sd (bias corrected)				145.5	
542												
543	Background Statistics Assuming Gamma Distribution											
544				95% Wilson Hilferty (WH) Approx. Gamma UPL		623.2	90% Percentile				542.7	
545				95% Hawkins Wixley (HW) Approx. Gamma UPL		626.2	95% Percentile				616.8	
546				95% WH Approx. Gamma UTL with	95% Coverage	724.9	99% Percentile				772.3	
547				95% HW Approx. Gamma UTL with	95% Coverage	733.8						
548					95% WH USL	868.4	95% HW USL				888.9	
549												
550	Lognormal GOF Test											
551					Shapiro Wilk Test Statistic	0.821	Shapiro Wilk Lognormal GOF Test					
552					5% Shapiro Wilk Critical Value	0.93	Data Not Lognormal at 5% Significance Level					
553					Lilliefors Test Statistic	0.243	Lilliefors Lognormal GOF Test					
554					5% Lilliefors Critical Value	0.154	Data Not Lognormal at 5% Significance Level					
555	Data Not Lognormal at 5% Significance Level											
556												
557	Background Statistics assuming Lognormal Distribution											
558				95% UTL with	95% Coverage	769.1	90% Percentile (z)				535.6	
559					95% UPL (t)	638.7	95% Percentile (z)				619.3	
560					95% USL	972.6	99% Percentile (z)				813.4	
561												
562	Nonparametric Distribution Free Background Statistics											
563	Data do not follow a Discernible Distribution (0.05)											
564												
565	Nonparametric Upper Limits for Background Threshold Values											
566					Order of Statistic, r	32	95% UTL with	95% Coverage			923	
567					Approx, f used to compute achieved CC	1.684	pproximate Actual Confidence Coefficient achieved by UTL				0.806	
568							Approximate Sample Size needed to achieve specified CC				59	
569				95% Percentile Bootstrap UTL with	95% Coverage	923	95% BCA Bootstrap UTL with	95% Coverage			923	
570					95% UPL	647.4	90% Percentile				479.1	
571					90% Chebyshev UPL	818.6	95% Percentile				495.7	
572					95% Chebyshev UPL	1032	99% Percentile				791.6	
573					95% USL	923						
574												
575	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
576	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
577	and consists of observations collected from clean unimpacted locations.											
578	The use of USL tends to provide a balance between false positives and false negatives provided the data											
579	represents a background data set and when many onsite observations need to be compared with the BTV.											
580												
581	TDS											
582												
583	General Statistics											

584	Total Number of Observations				32			Number of Distinct Observations			30
585								Number of Missing Observations			2
586				Minimum	540			First Quartile			667.3
587				Second Largest	1140			Median			765.5
588				Maximum	1890			Third Quartile			1010
589				Mean	854.5			SD			278.4
590				Coefficient of Variation	0.326			Skewness			1.637
591				Mean of logged Data	6.706			SD of logged Data			0.295
592											
593	Critical Values for Background Threshold Values (BTVs)										
594				Tolerance Factor K (For UTL)	2.186			d2max (for USL)			2.773
595											
596	Normal GOF Test										
597				Shapiro Wilk Test Statistic	0.84			Shapiro Wilk GOF Test			
598				5% Shapiro Wilk Critical Value	0.93			Data Not Normal at 5% Significance Level			
599				Lilliefors Test Statistic	0.197			Lilliefors GOF Test			
600				5% Lilliefors Critical Value	0.154			Data Not Normal at 5% Significance Level			
601	Data Not Normal at 5% Significance Level										
602											
603	Background Statistics Assuming Normal Distribution										
604			95% UTL with	95% Coverage	1463			90% Percentile (z)			1211
605				95% UPL (t)	1334			95% Percentile (z)			1312
606				95% USL	1626			99% Percentile (z)			1502
607											
608	Gamma GOF Test										
609				A-D Test Statistic	0.942			Anderson-Darling Gamma GOF Test			
610				5% A-D Critical Value	0.746			Data Not Gamma Distributed at 5% Significance Level			
611				K-S Test Statistic	0.193			Kolmogorov-Smirnov Gamma GOF Test			
612				5% K-S Critical Value	0.155			Data Not Gamma Distributed at 5% Significance Level			
613	Data Not Gamma Distributed at 5% Significance Level										
614											
615	Gamma Statistics										
616				k hat (MLE)	11.44			k star (bias corrected MLE)			10.39
617				Theta hat (MLE)	74.69			Theta star (bias corrected MLE)			82.25
618				nu hat (MLE)	732.2			nu star (bias corrected)			664.9
619				MLE Mean (bias corrected)	854.5			MLE Sd (bias corrected)			265.1
620											
621	Background Statistics Assuming Gamma Distribution										
622			95% Wilson Hilferty (WH) Approx. Gamma UPL		1342			90% Percentile			1207
623			95% Hawkins Wixley (HW) Approx. Gamma UPL		1345			95% Percentile			1332
624			95% WH Approx. Gamma UTL with	95% Coverage	1509			99% Percentile			1589
625			95% HW Approx. Gamma UTL with	95% Coverage	1519						
626				95% WH USL	1740			95% HW USL			1763
627											
628	Lognormal GOF Test										
629				Shapiro Wilk Test Statistic	0.918			Shapiro Wilk Lognormal GOF Test			
630				5% Shapiro Wilk Critical Value	0.93			Data Not Lognormal at 5% Significance Level			
631				Lilliefors Test Statistic	0.182			Lilliefors Lognormal GOF Test			
632				5% Lilliefors Critical Value	0.154			Data Not Lognormal at 5% Significance Level			
633	Data Not Lognormal at 5% Significance Level										
634											
635	Background Statistics assuming Lognormal Distribution										
636			95% UTL with	95% Coverage	1557			90% Percentile (z)			1193

	A	B	C	D	E	F	G	H	I	J	K	L
637					95% UPL (t)	1358				95% Percentile (z)		1328
638					95% USL	1851				99% Percentile (z)		1623
639												
640					Nonparametric Distribution Free Background Statistics							
641					Data do not follow a Discernible Distribution (0.05)							
642												
643					Nonparametric Upper Limits for Background Threshold Values							
644					Order of Statistic, r	32				95% UTL with 95% Coverage		1890
645					Approx, f used to compute achieved CC	1.684				pproximate Actual Confidence Coefficient achieved by UTL		0.806
646										Approximate Sample Size needed to achieve specified CC		59
647				95% Percentile Bootstrap UTL with	95% Coverage	1890				95% BCA Bootstrap UTL with 95% Coverage		1890
648					95% UPL	1403				90% Percentile		1118
649					90% Chebyshev UPL	1703				95% Percentile		1135
650					95% Chebyshev UPL	2087				99% Percentile		1658
651					95% USL	1890						
652												
653					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
654					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
655					and consists of observations collected from clean unimpacted locations.							
656					The use of USL tends to provide a balance between false positives and false negatives provided the data							
657					represents a background data set and when many onsite observations need to be compared with the BTV.							
658												

	Background Statistics for Data Sets with Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/13/2022 8:48:58 AM	
From File	LRS_ProUCL_UPL_Input_2021_v1.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Coverage	95%	
Different or Future K Observations	1	
Number of Bootstrap Operations	2000	

Sb

General Statistics

Total Number of Observations	30	Number of Missing Observations	4
Number of Distinct Observations	1		
Number of Detects	0	Number of Non-Detects	30
Number of Distinct Detects	0	Number of Distinct Non-Detects	1
Minimum Detect	N/A	Minimum Non-Detect	0.002
Maximum Detect	N/A	Maximum Non-Detect	0.002
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Sb was not processed!

As

General Statistics

Total Number of Observations	30	Number of Missing Observations	4
Number of Distinct Observations	1		
Number of Detects	0	Number of Non-Detects	30
Number of Distinct Detects	0	Number of Distinct Non-Detects	1
Minimum Detect	N/A	Minimum Non-Detect	0.005
Maximum Detect	N/A	Maximum Non-Detect	0.005
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable As was not processed!

Ba

General Statistics

54					Total Number of Observations	34				Number of Distinct Observations		26
55					Minimum	0.0427				First Quartile		0.0528
56					Second Largest	0.13				Median		0.0815
57					Maximum	0.24				Third Quartile		0.11
58					Mean	0.0871				SD		0.0396
59					Coefficient of Variation	0.454				Skewness		1.73
60					Mean of logged Data	-2.527				SD of logged Data		0.415
61												
62					Critical Values for Background Threshold Values (BTVs)							
63					Tolerance Factor K (For UTL)	2.166				d2max (for USL)		2.799
64												
65					Normal GOF Test							
66					Shapiro Wilk Test Statistic	0.847				Shapiro Wilk GOF Test		
67					5% Shapiro Wilk Critical Value	0.933				Data Not Normal at 5% Significance Level		
68					Lilliefors Test Statistic	0.131				Lilliefors GOF Test		
69					5% Lilliefors Critical Value	0.15				Data appear Normal at 5% Significance Level		
70					Data appear Approximate Normal at 5% Significance Level							
71												
72					Background Statistics Assuming Normal Distribution							
73				95% UTL with	95% Coverage	0.173				90% Percentile (z)		0.138
74					95% UPL (t)	0.155				95% Percentile (z)		0.152
75					95% USL	0.198				99% Percentile (z)		0.179
76												
77					Gamma GOF Test							
78					A-D Test Statistic	0.649				Anderson-Darling Gamma GOF Test		
79					5% A-D Critical Value	0.749				Detected data appear Gamma Distributed at 5% Significance Level		
80					K-S Test Statistic	0.143				Kolmogorov-Smirnov Gamma GOF Test		
81					5% K-S Critical Value	0.151				Detected data appear Gamma Distributed at 5% Significance Level		
82					Detected data appear Gamma Distributed at 5% Significance Level							
83												
84					Gamma Statistics							
85					k hat (MLE)	5.941				k star (bias corrected MLE)		5.436
86					Theta hat (MLE)	0.0147				Theta star (bias corrected MLE)		0.016
87					nu hat (MLE)	404				nu star (bias corrected)		369.7
88					MLE Mean (bias corrected)	0.0871				MLE Sd (bias corrected)		0.0374
89												
90					Background Statistics Assuming Gamma Distribution							
91				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.158				90% Percentile		0.137
92				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.159				95% Percentile		0.156
93				95% WH Approx. Gamma UTL with	95% Coverage	0.183				99% Percentile		0.197
94				95% HW Approx. Gamma UTL with	95% Coverage	0.186						
95					95% WH USL	0.224				95% HW USL		0.23
96												
97					Lognormal GOF Test							
98					Shapiro Wilk Test Statistic	0.941				Shapiro Wilk Lognormal GOF Test		
99					5% Shapiro Wilk Critical Value	0.933				Data appear Lognormal at 5% Significance Level		
100					Lilliefors Test Statistic	0.144				Lilliefors Lognormal GOF Test		
101					5% Lilliefors Critical Value	0.15				Data appear Lognormal at 5% Significance Level		
102					Data appear Lognormal at 5% Significance Level							
103												
104					Background Statistics assuming Lognormal Distribution							
105				95% UTL with	95% Coverage	0.196				90% Percentile (z)		0.136
106					95% UPL (t)	0.163				95% Percentile (z)		0.158

107				95% USL	0.256			99% Percentile (z)			0.21
108											
109				Nonparametric Distribution Free Background Statistics							
110				Data appear Approximate Normal at 5% Significance Level							
111											
112				Nonparametric Upper Limits for Background Threshold Values							
113				Order of Statistic, r	34			95% UTL with 95% Coverage			0.24
114				Approx, f used to compute achieved CC	1.789			pproximate Actual Confidence Coefficient achieved by UTL			0.825
115								Approximate Sample Size needed to achieve specified CC			59
116				95% Percentile Bootstrap UTL with 95% Coverage	0.24			95% BCA Bootstrap UTL with 95% Coverage			0.13
117				95% UPL	0.158			90% Percentile			0.127
118				90% Chebyshev UPL	0.208			95% Percentile			0.13
119				95% Chebyshev UPL	0.262			99% Percentile			0.204
120				95% USL	0.24						
121											
122				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
123				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
124				and consists of observations collected from clean unimpacted locations.							
125				The use of USL tends to provide a balance between false positives and false negatives provided the data							
126				represents a background data set and when many onsite observations need to be compared with the BTV.							
127											
128	Be										
129											
130				General Statistics							
131				Total Number of Observations	30			Number of Missing Observations			4
132				Number of Distinct Observations	1						
133				Number of Detects	0			Number of Non-Detects			30
134				Number of Distinct Detects	0			Number of Distinct Non-Detects			1
135				Minimum Detect	N/A			Minimum Non-Detect			0.001
136				Maximum Detect	N/A			Maximum Non-Detect			0.001
137				Variance Detected	N/A			Percent Non-Detects			100%
138				Mean Detected	N/A			SD Detected			N/A
139				Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A
140											
141				Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!							
142				Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!							
143				The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).							
144											
145				The data set for variable Be was not processed!							
146											
147											
148	Cd										
149											
150				General Statistics							
151				Total Number of Observations	30			Number of Missing Observations			4
152				Number of Distinct Observations	1						
153				Number of Detects	0			Number of Non-Detects			30
154				Number of Distinct Detects	0			Number of Distinct Non-Detects			1
155				Minimum Detect	N/A			Minimum Non-Detect			0.001
156				Maximum Detect	N/A			Maximum Non-Detect			0.001
157				Variance Detected	N/A			Percent Non-Detects			100%
158				Mean Detected	N/A			SD Detected			N/A
159				Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A

160											
161	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
162	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
163	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
164											
165	The data set for variable Cd was not processed!										
166											
167											
168	Cr										
169											
170	General Statistics										
171	Total Number of Observations			34			Number of Missing Observations			0	
172	Number of Distinct Observations			12							
173	Number of Detects			11			Number of Non-Detects			23	
174	Number of Distinct Detects			10			Number of Distinct Non-Detects			2	
175	Minimum Detect			0.0022			Minimum Non-Detect			0.002	
176	Maximum Detect			0.011			Maximum Non-Detect			0.005	
177	Variance Detected			6.2036E-6			Percent Non-Detects			67.65%	
178	Mean Detected			0.00438			SD Detected			0.00249	
179	Mean of Detected Logged Data			-5.542			SD of Detected Logged Data			0.468	
180											
181	Critical Values for Background Threshold Values (BTVs)										
182	Tolerance Factor K (For UTL)			2.166			d2max (for USL)			2.799	
183											
184	Normal GOF Test on Detects Only										
185	Shapiro Wilk Test Statistic			0.778			Shapiro Wilk GOF Test				
186	5% Shapiro Wilk Critical Value			0.85			Data Not Normal at 5% Significance Level				
187	Lilliefors Test Statistic			0.208			Lilliefors GOF Test				
188	5% Lilliefors Critical Value			0.251			Detected Data appear Normal at 5% Significance Level				
189	Detected Data appear Approximate Normal at 5% Significance Level										
190											
191	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
192	KM Mean			0.00282			KM SD			0.00175	
193	95% UTL95% Coverage			0.00662			95% KM UPL (t)			0.00583	
194	90% KM Percentile (z)			0.00506			95% KM Percentile (z)			0.0057	
195	99% KM Percentile (z)			0.0069			95% KM USL			0.00773	
196											
197	DL/2 Substitution Background Statistics Assuming Normal Distribution										
198	Mean			0.00227			SD			0.00207	
199	95% UTL95% Coverage			0.00676			95% UPL (t)			0.00583	
200	90% Percentile (z)			0.00493			95% Percentile (z)			0.00568	
201	99% Percentile (z)			0.0071			95% USL			0.00808	
202	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
203											
204	Gamma GOF Tests on Detected Observations Only										
205	A-D Test Statistic			0.428			Anderson-Darling GOF Test				
206	5% A-D Critical Value			0.732			Detected data appear Gamma Distributed at 5% Significance Level				
207	K-S Test Statistic			0.143			Kolmogorov-Smirnov GOF				
208	5% K-S Critical Value			0.256			Detected data appear Gamma Distributed at 5% Significance Level				
209	Detected data appear Gamma Distributed at 5% Significance Level										
210											
211	Gamma Statistics on Detected Data Only										
212	k hat (MLE)			4.654			k star (bias corrected MLE)			3.446	

	A	B	C	D	E	F	G	H	I	J	K	L
213				Theta hat (MLE)		9.4145E-4			Theta star (bias corrected MLE)			0.00127
214				nu hat (MLE)		102.4			nu star (bias corrected)			75.8
215				MLE Mean (bias corrected)		0.00438						
216				MLE Sd (bias corrected)		0.00236			95% Percentile of Chisquare (2kstar)			13.91
217												
218					Gamma ROS Statistics using Imputed Non-Detects							
219					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
220					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
221					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
222					This is especially true when the sample size is small.							
223					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
224				Minimum		0.0022			Mean			0.00818
225				Maximum		0.011			Median			0.01
226				SD		0.003			CV			0.367
227				k hat (MLE)		5.046			k star (bias corrected MLE)			4.621
228				Theta hat (MLE)		0.00162			Theta star (bias corrected MLE)			0.00177
229				nu hat (MLE)		343.2			nu star (bias corrected)			314.2
230				MLE Mean (bias corrected)		0.00818			MLE Sd (bias corrected)			0.00381
231				95% Percentile of Chisquare (2kstar)		17.26			90% Percentile			0.0133
232				95% Percentile		0.0153			99% Percentile			0.0195
233					The following statistics are computed using Gamma ROS Statistics on Imputed Data							
234					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
235					WH	HW					WH	HW
236				95% Approx. Gamma UTL with 95% Coverage	0.0182	0.019			95% Approx. Gamma UPL		0.0155	0.016
237				95% Gamma USL	0.0225	0.0239						
238												
239					Estimates of Gamma Parameters using KM Estimates							
240				Mean (KM)		0.00282			SD (KM)			0.00175
241				Variance (KM)		3.0775E-6			SE of Mean (KM)			3.1934E-4
242				k hat (KM)		2.575			k star (KM)			2.367
243				nu hat (KM)		175.1			nu star (KM)			161
244				theta hat (KM)		0.00109			theta star (KM)			0.00119
245				80% gamma percentile (KM)		0.00413			90% gamma percentile (KM)			0.00526
246				95% gamma percentile (KM)		0.00634			99% gamma percentile (KM)			0.00869
247												
248					The following statistics are computed using gamma distribution and KM estimates							
249					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
250					WH	HW					WH	HW
251				95% Approx. Gamma UTL with 95% Coverage	0.00622	0.00619			95% Approx. Gamma UPL		0.00529	0.00524
252				95% KM Gamma Percentile	0.00516	0.0051			95% Gamma USL		0.0077	0.00773
253												
254					Lognormal GOF Test on Detected Observations Only							
255				Shapiro Wilk Test Statistic		0.934			Shapiro Wilk GOF Test			
256				5% Shapiro Wilk Critical Value		0.85			Detected Data appear Lognormal at 5% Significance Level			
257				Lilliefors Test Statistic		0.127			Lilliefors GOF Test			
258				5% Lilliefors Critical Value		0.251			Detected Data appear Lognormal at 5% Significance Level			
259					Detected Data appear Lognormal at 5% Significance Level							
260												
261					Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects							
262				Mean in Original Scale		0.00219			Mean in Log Scale			-6.465
263				SD in Original Scale		0.00211			SD in Log Scale			0.832
264				95% UTL95% Coverage		0.00943			95% BCA UTL95% Coverage			0.011
265				95% Bootstrap (%) UTL95% Coverage		0.011			95% UPL (t)			0.00649

266				90% Percentile (z)	0.00452				95% Percentile (z)		0.00611
267				99% Percentile (z)	0.0108				95% USL		0.016
268											
269	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
270				KM Mean of Logged Data	-5.981			95% KM UTL (Lognormal)95% Coverage			0.00611
271				KM SD of Logged Data	0.408			95% KM UPL (Lognormal)			0.00509
272			95% KM Percentile Lognormal (z)		0.00494			95% KM USL (Lognormal)			0.00791
273											
274	Background DL/2 Statistics Assuming Lognormal Distribution										
275				Mean in Original Scale	0.00227			Mean in Log Scale			-6.358
276				SD in Original Scale	0.00207			SD in Log Scale			0.692
277				95% UTL95% Coverage	0.00776			95% UPL (t)			0.00569
278				90% Percentile (z)	0.00421			95% Percentile (z)			0.00541
279				99% Percentile (z)	0.00867			95% USL			0.012
280	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
281											
282	Nonparametric Distribution Free Background Statistics										
283	Data appear to follow a Discernible Distribution at 5% Significance Level										
284											
285	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
286				Order of Statistic, r	34			95% UTL with95% Coverage			0.011
287				Approx, f used to compute achieved CC	1.789			pproximate Actual Confidence Coefficient achieved by UTL			0.825
288			Approximate Sample Size needed to achieve specified CC		59			95% UPL			0.0071
289				95% USL	0.011			95% KM Chebyshev UPL			0.0106
290											
291	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
292	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
293	and consists of observations collected from clean unimpacted locations.										
294	The use of USL tends to provide a balance between false positives and false negatives provided the data										
295	represents a background data set and when many onsite observations need to be compared with the BTV.										
296											
297	Co										
298											
299	General Statistics										
300				Total Number of Observations	32			Number of Missing Observations			2
301				Number of Distinct Observations	3						
302				Number of Detects	3			Number of Non-Detects			29
303				Number of Distinct Detects	3			Number of Distinct Non-Detects			1
304				Minimum Detect	0.001			Minimum Non-Detect			0.001
305				Maximum Detect	0.004			Maximum Non-Detect			0.001
306				Variance Detected	2.6533E-6			Percent Non-Detects			90.63%
307				Mean Detected	0.00213			SD Detected			0.00163
308				Mean of Detected Logged Data	-6.333			SD of Detected Logged Data			0.723
309											
310	Warning: Data set has only 3 Detected Values.										
311	This is not enough to compute meaningful or reliable statistics and estimates.										
312											
313											
314	Critical Values for Background Threshold Values (BTVs)										
315				Tolerance Factor K (For UTL)	2.186			d2max (for USL)			2.773
316											
317	Normal GOF Test on Detects Only										
318				Shapiro Wilk Test Statistic	0.848			Shapiro Wilk GOF Test			

	A	B	C	D	E	F	G	H	I	J	K	L
319				5% Shapiro Wilk Critical Value		0.767	Detected Data appear Normal at 5% Significance Level					
320				Lilliefors Test Statistic		0.34	Lilliefors GOF Test					
321				5% Lilliefors Critical Value		0.425	Detected Data appear Normal at 5% Significance Level					
322				Detected Data appear Normal at 5% Significance Level								
323												
324				Kaplan Meier (KM) Background Statistics Assuming Normal Distribution								
325				KM Mean		0.00111	KM SD	5.2437E-4				
326				95% UTL95% Coverage		0.00225	95% KM UPL (t)	0.00201				
327				90% KM Percentile (z)		0.00178	95% KM Percentile (z)	0.00197				
328				99% KM Percentile (z)		0.00233	95% KM USL	0.00256				
329												
330				DL/2 Substitution Background Statistics Assuming Normal Distribution								
331				Mean		6.5313E-4	SD	6.3651E-4				
332				95% UTL95% Coverage		0.00204	95% UPL (t)	0.00175				
333				90% Percentile (z)		0.00147	95% Percentile (z)	0.0017				
334				99% Percentile (z)		0.00213	95% USL	0.00242				
335				DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons								
336												
337				Gamma GOF Tests on Detected Observations Only								
338				Not Enough Data to Perform GOF Test								
339												
340				Gamma Statistics on Detected Data Only								
341				k hat (MLE)		2.882	k star (bias corrected MLE)	N/A				
342				Theta hat (MLE)		7.4031E-4	Theta star (bias corrected MLE)	N/A				
343				nu hat (MLE)		17.29	nu star (bias corrected)	N/A				
344				MLE Mean (bias corrected)		N/A						
345				MLE Sd (bias corrected)		N/A	95% Percentile of Chisquare (2kstar)	N/A				
346												
347				Gamma ROS Statistics using Imputed Non-Detects								
348				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs								
349				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)								
350				For such situations, GROS method may yield incorrect values of UCLs and BTVs								
351				This is especially true when the sample size is small.								
352				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates								
353				Minimum		0.001	Mean	0.00926				
354				Maximum		0.01	Median	0.01				
355				SD		0.00237	CV	0.255				
356				k hat (MLE)		6.015	k star (bias corrected MLE)	5.472				
357				Theta hat (MLE)		0.00154	Theta star (bias corrected MLE)	0.00169				
358				nu hat (MLE)		385	nu star (bias corrected)	350.2				
359				MLE Mean (bias corrected)		0.00926	MLE Sd (bias corrected)	0.00396				
360				95% Percentile of Chisquare (2kstar)		19.6	90% Percentile	0.0146				
361				95% Percentile		0.0166	99% Percentile	0.0209				
362				The following statistics are computed using Gamma ROS Statistics on Imputed Data								
363				Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods								
364					WH	HW				WH	HW	
365				95% Approx. Gamma UTL with 95% Coverage	0.0194	0.0208	95% Approx. Gamma UPL			0.0167	0.0176	
366				95% Gamma USL	0.0233	0.0254						
367												
368				Estimates of Gamma Parameters using KM Estimates								
369				Mean (KM)		0.00111	SD (KM)	5.2437E-4				
370				Variance (KM)		2.7496E-7	SE of Mean (KM)	1.1353E-4				
371				k hat (KM)		4.451	k star (KM)	4.054				

372				nu hat (KM)	284.8			nu star (KM)	259.5		
373				theta hat (KM)	2.4855E-4			theta star (KM)	2.7286E-4		
374				80% gamma percentile (KM)	0.00152			90% gamma percentile (KM)	0.00184		
375				95% gamma percentile (KM)	0.00214			99% gamma percentile (KM)	0.00276		
376											
377	The following statistics are computed using gamma distribution and KM estimates										
378	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods										
379					WH	HW				WH	HW
380	95% Approx. Gamma UTL with 95% Coverage				0.00195	0.00191	95% Approx. Gamma UPL			0.00173	0.0017
381	95% KM Gamma Percentile				0.0017	0.00167	95% Gamma USL			0.00225	0.00221
382											
383	Lognormal GOF Test on Detected Observations Only										
384	Shapiro Wilk Test Statistic				0.919		Shapiro Wilk GOF Test				
385	5% Shapiro Wilk Critical Value				0.767		Detected Data appear Lognormal at 5% Significance Level				
386	Lilliefors Test Statistic				0.296		Lilliefors GOF Test				
387	5% Lilliefors Critical Value				0.425		Detected Data appear Lognormal at 5% Significance Level				
388	Detected Data appear Lognormal at 5% Significance Level										
389											
390	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
391	Mean in Original Scale				2.4648E-4		Mean in Log Scale			-11.03	
392	SD in Original Scale				7.4740E-4		SD in Log Scale			2.591	
393	95% UTL95% Coverage				0.00469		95% BCA UTL95% Coverage			0.004	
394	95% Bootstrap (%) UTL95% Coverage				0.004		95% UPL (t)			0.00141	
395	90% Percentile (z)				4.4943E-4		95% Percentile (z)			0.00115	
396	99% Percentile (z)				0.00674		95% USL			0.0215	
397											
398	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
399	KM Mean of Logged Data				-6.854		95% KM UTL (Lognormal)95% Coverage			0.00181	
400	KM SD of Logged Data				0.246		95% KM UPL (Lognormal)			0.00161	
401	95% KM Percentile Lognormal (z)				0.00158		95% KM USL (Lognormal)			0.00209	
402											
403	Background DL/2 Statistics Assuming Lognormal Distribution										
404	Mean in Original Scale				6.5313E-4		Mean in Log Scale			-7.482	
405	SD in Original Scale				6.3651E-4		SD in Log Scale			0.418	
406	95% UTL95% Coverage				0.0014		95% UPL (t)			0.00116	
407	90% Percentile (z)				9.6193E-4		95% Percentile (z)			0.00112	
408	99% Percentile (z)				0.00149		95% USL			0.00179	
409	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
410											
411	Nonparametric Distribution Free Background Statistics										
412	Data appear to follow a Discernible Distribution at 5% Significance Level										
413											
414	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
415	Order of Statistic, r				32		95% UTL with95% Coverage			0.004	
416	Approx, f used to compute achieved CC				1.684		pproximate Actual Confidence Coefficient achieved by UTL			0.806	
417	Approximate Sample Size needed to achieve specified CC				59		95% UPL			0.00231	
418	95% USL				0.004		95% KM Chebyshev UPL			0.00343	
419											
420	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
421	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
422	and consists of observations collected from clean unimpacted locations.										
423	The use of USL tends to provide a balance between false positives and false negatives provided the data										
424	represents a background data set and when many onsite observations need to be compared with the BTV.										

	A	B	C	D	E	F	G	H	I	J	K	L
425												
426	Pb											
427												
428					General Statistics							
429					Total Number of Observations	30			Number of Missing Observations	4		
430					Number of Distinct Observations	2						
431					Number of Detects	1			Number of Non-Detects	29		
432					Number of Distinct Detects	1			Number of Distinct Non-Detects	1		
433					Minimum Detect	0.0041			Minimum Non-Detect	0.001		
434					Maximum Detect	0.0041			Maximum Non-Detect	0.001		
435					Variance Detected	N/A			Percent Non-Detects	96.67%		
436					Mean Detected	0.0041			SD Detected	N/A		
437					Mean of Detected Logged Data	-5.497			SD of Detected Logged Data	N/A		
438												
439					Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!							
440	s suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BT											
441												
442					The data set for variable Pb was not processed!							
443												
444												
445	Li											
446												
447					General Statistics							
448					Total Number of Observations	34			Number of Missing Observations	0		
449					Number of Distinct Observations	29						
450					Number of Detects	32			Number of Non-Detects	2		
451					Number of Distinct Detects	27			Number of Distinct Non-Detects	2		
452					Minimum Detect	0.0317			Minimum Non-Detect	0.0331		
453					Maximum Detect	0.063			Maximum Non-Detect	0.0406		
454					Variance Detected	3.9726E-5			Percent Non-Detects	5.882%		
455					Mean Detected	0.0422			SD Detected	0.0063		
456					Mean of Detected Logged Data	-3.176			SD of Detected Logged Data	0.144		
457												
458					Critical Values for Background Threshold Values (BTVs)							
459					Tolerance Factor K (For UTL)	2.166			d2max (for USL)	2.799		
460												
461					Normal GOF Test on Detects Only							
462					Shapiro Wilk Test Statistic	0.934			Shapiro Wilk GOF Test			
463					5% Shapiro Wilk Critical Value	0.93			Detected Data appear Normal at 5% Significance Level			
464					Lilliefors Test Statistic	0.136			Lilliefors GOF Test			
465					5% Lilliefors Critical Value	0.154			Detected Data appear Normal at 5% Significance Level			
466					Detected Data appear Normal at 5% Significance Level							
467												
468					Kaplan Meier (KM) Background Statistics Assuming Normal Distribution							
469					KM Mean	0.0417			KM SD	0.00632		
470					95% UTL95% Coverage	0.0554			95% KM UPL (t)	0.0526		
471					90% KM Percentile (z)	0.0498			95% KM Percentile (z)	0.0521		
472					99% KM Percentile (z)	0.0564			95% KM USL	0.0594		
473												
474					DL/2 Substitution Background Statistics Assuming Normal Distribution							
475					Mean	0.0408			SD	0.00835		
476					95% UTL95% Coverage	0.0589			95% UPL (t)	0.0551		
477					90% Percentile (z)	0.0515			95% Percentile (z)	0.0545		

	A	B	C	D	E	F	G	H	I	J	K	L
478				99% Percentile (z)		0.0602					95% USL	0.0642
479	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
480												
481	Gamma GOF Tests on Detected Observations Only											
482				A-D Test Statistic		0.363	Anderson-Darling GOF Test					
483				5% A-D Critical Value		0.744	Detected data appear Gamma Distributed at 5% Significance Level					
484				K-S Test Statistic		0.118	Kolmogorov-Smirnov GOF					
485				5% K-S Critical Value		0.155	Detected data appear Gamma Distributed at 5% Significance Level					
486	Detected data appear Gamma Distributed at 5% Significance Level											
487												
488	Gamma Statistics on Detected Data Only											
489				k hat (MLE)		48.97	k star (bias corrected MLE)					44.4
490				Theta hat (MLE)		8.6126E-4	Theta star (bias corrected MLE)					9.4991E-4
491				nu hat (MLE)		3134	nu star (bias corrected)					2842
492				MLE Mean (bias corrected)		0.0422						
493				MLE Sd (bias corrected)		0.00633	95% Percentile of Chisquare (2kstar)					111.8
494												
495	Gamma ROS Statistics using Imputed Non-Detects											
496	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
497	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
498	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
499	This is especially true when the sample size is small.											
500	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
501				Minimum		0.0312	Mean					0.0417
502				Maximum		0.063	Median					0.0411
503				SD		0.00645	CV					0.155
504				k hat (MLE)		45.46	k star (bias corrected MLE)					41.47
505				Theta hat (MLE)		9.1722E-4	Theta star (bias corrected MLE)					0.00101
506				nu hat (MLE)		3091	nu star (bias corrected)					2820
507				MLE Mean (bias corrected)		0.0417	MLE Sd (bias corrected)					0.00648
508				95% Percentile of Chisquare (2kstar)		105.2	90% Percentile					0.0502
509				95% Percentile		0.0529	99% Percentile					0.0582
510	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
511	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
512					WH	HW					WH	HW
513				95% Approx. Gamma UTL with 95% Coverage	0.0564	0.0566	95% Approx. Gamma UPL				0.0531	0.0531
514				95% Gamma USL	0.0615	0.0617						
515												
516	Estimates of Gamma Parameters using KM Estimates											
517				Mean (KM)		0.0417	SD (KM)					0.00632
518				Variance (KM)		3.9990E-5	SE of Mean (KM)					0.00111
519				k hat (KM)		43.53	k star (KM)					39.71
520				nu hat (KM)		2960	nu star (KM)					2700
521				theta hat (KM)		9.5844E-4	theta star (KM)					0.00105
522				80% gamma percentile (KM)		0.0472	90% gamma percentile (KM)					0.0504
523				95% gamma percentile (KM)		0.0532	99% gamma percentile (KM)					0.0587
524												
525	The following statistics are computed using gamma distribution and KM estimates											
526	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
527					WH	HW					WH	HW
528				95% Approx. Gamma UTL with 95% Coverage	0.0561	0.0563	95% Approx. Gamma UPL				0.0528	0.0529
529				95% KM Gamma Percentile	0.0523	0.0524	95% Gamma USL				0.061	0.0613
530												

	A	B	C	D	E	F	G	H	I	J	K	L
531	Lognormal GOF Test on Detected Observations Only											
532					Shapiro Wilk Test Statistic	0.969	Shapiro Wilk GOF Test					
533					5% Shapiro Wilk Critical Value	0.93	Detected Data appear Lognormal at 5% Significance Level					
534					Lilliefors Test Statistic	0.108	Lilliefors GOF Test					
535					5% Lilliefors Critical Value	0.154	Detected Data appear Lognormal at 5% Significance Level					
536	Detected Data appear Lognormal at 5% Significance Level											
537												
538	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
539					Mean in Original Scale	0.0417	Mean in Log Scale	-3.188				
540					SD in Original Scale	0.00642	SD in Log Scale	0.148				
541					95% UTL95% Coverage	0.0569	95% BCA UTL95% Coverage	0.0546				
542					95% Bootstrap (%) UTL95% Coverage	0.063	95% UPL (t)	0.0532				
543					90% Percentile (z)	0.0499	95% Percentile (z)	0.0527				
544					99% Percentile (z)	0.0583	95% USL	0.0625				
545												
546	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
547					KM Mean of Logged Data	-3.188	95% KM UTL (Lognormal)95% Coverage	0.0567				
548					KM SD of Logged Data	0.146	95% KM UPL (Lognormal)	0.0531				
549					95% KM Percentile Lognormal (z)	0.0525	95% KM USL (Lognormal)	0.0621				
550												
551	Background DL/2 Statistics Assuming Lognormal Distribution											
552					Mean in Original Scale	0.0408	Mean in Log Scale	-3.225				
553					SD in Original Scale	0.00835	SD in Log Scale	0.242				
554					95% UTL95% Coverage	0.0672	95% UPL (t)	0.0603				
555					90% Percentile (z)	0.0543	95% Percentile (z)	0.0593				
556					99% Percentile (z)	0.0699	95% USL	0.0784				
557	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
558												
559	Nonparametric Distribution Free Background Statistics											
560	Data appear to follow a Discernible Distribution at 5% Significance Level											
561												
562	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
563					Order of Statistic, r	34	95% UTL with95% Coverage	0.063				
564					Approx, f used to compute achieved CC	1.789	pproximate Actual Confidence Coefficient achieved by UTL	0.825				
565					Approximate Sample Size needed to achieve specified CC	59	95% UPL	0.0533				
566					95% USL	0.063	95% KM Chebyshev UPL	0.0697				
567												
568	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
569	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
570	and consists of observations collected from clean unimpacted locations.											
571	The use of USL tends to provide a balance between false positives and false negatives provided the data											
572	represents a background data set and when many onsite observations need to be compared with the BTV.											
573												
574	Hg											
575												
576	General Statistics											
577					Total Number of Observations	30	Number of Missing Observations	4				
578					Number of Distinct Observations	1						
579					Number of Detects	0	Number of Non-Detects	30				
580					Number of Distinct Detects	0	Number of Distinct Non-Detects	1				
581					Minimum Detect	N/A	Minimum Non-Detect	2.0000E-4				
582					Maximum Detect	N/A	Maximum Non-Detect	2.0000E-4				
583					Variance Detected	N/A	Percent Non-Detects	100%				

584				Mean Detected	N/A				SD Detected	N/A	
585				Mean of Detected Logged Data	N/A				SD of Detected Logged Data	N/A	
586											
587	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
588	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
589	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
590											
591	The data set for variable Hg was not processed!										
592											
593											
594	Mo										
595											
596	General Statistics										
597				Total Number of Observations	34				Number of Missing Observations	0	
598				Number of Distinct Observations	23						
599				Number of Detects	26				Number of Non-Detects	8	
600				Number of Distinct Detects	23				Number of Distinct Non-Detects	1	
601				Minimum Detect	0.00407				Minimum Non-Detect	0.01	
602				Maximum Detect	0.015				Maximum Non-Detect	0.01	
603				Variance Detected	1.2820E-5				Percent Non-Detects	23.53%	
604				Mean Detected	0.00862				SD Detected	0.00358	
605				Mean of Detected Logged Data	-4.838				SD of Detected Logged Data	0.422	
606											
607	Critical Values for Background Threshold Values (BTVs)										
608				Tolerance Factor K (For UTL)	2.166				d2max (for USL)	2.799	
609											
610	Normal GOF Test on Detects Only										
611				Shapiro Wilk Test Statistic	0.912				Shapiro Wilk GOF Test		
612				5% Shapiro Wilk Critical Value	0.92				Data Not Normal at 5% Significance Level		
613				Lilliefors Test Statistic	0.165				Lilliefors GOF Test		
614				5% Lilliefors Critical Value	0.17				Detected Data appear Normal at 5% Significance Level		
615	Detected Data appear Approximate Normal at 5% Significance Level										
616											
617	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
618				KM Mean	0.00809				KM SD	0.00331	
619				95% UTL95% Coverage	0.0153				95% KM UPL (t)	0.0138	
620				90% KM Percentile (z)	0.0123				95% KM Percentile (z)	0.0135	
621				99% KM Percentile (z)	0.0158				95% KM USL	0.0174	
622											
623	DL/2 Substitution Background Statistics Assuming Normal Distribution										
624				Mean	0.00777				SD	0.00349	
625				95% UTL95% Coverage	0.0153				95% UPL (t)	0.0138	
626				90% Percentile (z)	0.0122				95% Percentile (z)	0.0135	
627				99% Percentile (z)	0.0159				95% USL	0.0175	
628	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
629											
630	Gamma GOF Tests on Detected Observations Only										
631				A-D Test Statistic	0.479				Anderson-Darling GOF Test		
632				5% A-D Critical Value	0.746				Detected data appear Gamma Distributed at 5% Significance Level		
633				K-S Test Statistic	0.128				Kolmogorov-Smirnov GOF		
634				5% K-S Critical Value	0.171				Detected data appear Gamma Distributed at 5% Significance Level		
635	Detected data appear Gamma Distributed at 5% Significance Level										
636											

	A	B	C	D	E	F	G	H	I	J	K	L
637	Gamma Statistics on Detected Data Only											
638					k hat (MLE)	6.092			k star (bias corrected MLE)			5.415
639					Theta hat (MLE)	0.00142			Theta star (bias corrected MLE)			0.00159
640					nu hat (MLE)	316.8			nu star (bias corrected)			281.6
641					MLE Mean (bias corrected)	0.00862						
642					MLE Sd (bias corrected)	0.00371			95% Percentile of Chisquare (2kstar)			19.44
643												
644	Gamma ROS Statistics using Imputed Non-Detects											
645	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
646	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
647	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
648	This is especially true when the sample size is small.											
649	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
650					Minimum	0.00407			Mean			0.00895
651					Maximum	0.015			Median			0.0097
652					SD	0.00317			CV			0.355
653					k hat (MLE)	7.682			k star (bias corrected MLE)			7.024
654					Theta hat (MLE)	0.00116			Theta star (bias corrected MLE)			0.00127
655					nu hat (MLE)	522.4			nu star (bias corrected)			477.6
656					MLE Mean (bias corrected)	0.00895			MLE Sd (bias corrected)			0.00338
657					95% Percentile of Chisquare (2kstar)	23.75			90% Percentile			0.0135
658					95% Percentile	0.0151			99% Percentile			0.0186
659	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
660	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
661					WH	HW					WH	HW
662				95% Approx. Gamma UTL with 95% Coverage	0.0175	0.0178			95% Approx. Gamma UPL		0.0153	0.0155
663				95% Gamma USL	0.0209	0.0216						
664												
665	Estimates of Gamma Parameters using KM Estimates											
666					Mean (KM)	0.00809			SD (KM)			0.00331
667					Variance (KM)	1.0969E-5			SE of Mean (KM)			6.0302E-4
668					k hat (KM)	5.969			k star (KM)			5.462
669					nu hat (KM)	405.9			nu star (KM)			371.4
670					theta hat (KM)	0.00136			theta star (KM)			0.00148
671					80% gamma percentile (KM)	0.0108			90% gamma percentile (KM)			0.0127
672					95% gamma percentile (KM)	0.0145			99% gamma percentile (KM)			0.0182
673												
674	The following statistics are computed using gamma distribution and KM estimates											
675	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
676					WH	HW					WH	HW
677				95% Approx. Gamma UTL with 95% Coverage	0.0165	0.0167			95% Approx. Gamma UPL		0.0143	0.0144
678				95% KM Gamma Percentile	0.014	0.014			95% Gamma USL		0.02	0.0205
679												
680	Lognormal GOF Test on Detected Observations Only											
681					Shapiro Wilk Test Statistic	0.94			Shapiro Wilk GOF Test			
682					5% Shapiro Wilk Critical Value	0.92			Detected Data appear Lognormal at 5% Significance Level			
683					Lilliefors Test Statistic	0.106			Lilliefors GOF Test			
684					5% Lilliefors Critical Value	0.17			Detected Data appear Lognormal at 5% Significance Level			
685	Detected Data appear Lognormal at 5% Significance Level											
686												
687	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
688					Mean in Original Scale	0.00811			Mean in Log Scale			-4.893
689					SD in Original Scale	0.00334			SD in Log Scale			0.399

690				95% UTL95% Coverage	0.0178			95% BCA UTL95% Coverage			0.015	
691				95% Bootstrap (%) UTL95% Coverage	0.015			95% UPL (t)			0.0149	
692				90% Percentile (z)	0.0125			95% Percentile (z)			0.0145	
693				99% Percentile (z)	0.019			95% USL			0.023	
694												
695				Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution								
696				KM Mean of Logged Data	-4.897			95% KM UTL (Lognormal)95% Coverage			0.0177	
697				KM SD of Logged Data	0.398			95% KM UPL (Lognormal)			0.0148	
698				95% KM Percentile Lognormal (z)	0.0144			95% KM USL (Lognormal)			0.0228	
699												
700				Background DL/2 Statistics Assuming Lognormal Distribution								
701				Mean in Original Scale	0.00777			Mean in Log Scale			-4.946	
702				SD in Original Scale	0.00349			SD in Log Scale			0.418	
703				95% UTL95% Coverage	0.0176			95% UPL (t)			0.0146	
704				90% Percentile (z)	0.0121			95% Percentile (z)			0.0141	
705				99% Percentile (z)	0.0188			95% USL			0.0229	
706				DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.								
707												
708				Nonparametric Distribution Free Background Statistics								
709				Data appear to follow a Discernible Distribution at 5% Significance Level								
710												
711				Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)								
712				Order of Statistic, r	34			95% UTL with95% Coverage			0.015	
713				Approx, f used to compute achieved CC	1.789			pproximate Actual Confidence Coefficient achieved by UTL			0.825	
714				Approximate Sample Size needed to achieve specified CC	59			95% UPL			0.015	
715				95% USL	0.015			95% KM Chebyshev UPL			0.0227	
716												
717				Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.								
718				Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers								
719				and consists of observations collected from clean unimpacted locations.								
720				The use of USL tends to provide a balance between false positives and false negatives provided the data								
721				represents a background data set and when many onsite observations need to be compared with the BTV.								
722												
723	Ra											
724												
725				General Statistics								
726				Total Number of Observations	30			Number of Missing Observations			4	
727				Number of Distinct Observations	29							
728				Number of Detects	9			Number of Non-Detects			21	
729				Number of Distinct Detects	9			Number of Distinct Non-Detects			20	
730				Minimum Detect	0.482			Minimum Non-Detect			0.347	
731				Maximum Detect	1.09			Maximum Non-Detect			1.88	
732				Variance Detected	0.0348			Percent Non-Detects			70%	
733				Mean Detected	0.722			SD Detected			0.186	
734				Mean of Detected Logged Data	-0.354			SD of Detected Logged Data			0.249	
735												
736				Critical Values for Background Threshold Values (BTVs)								
737				Tolerance Factor K (For UTL)	2.22			d2max (for USL)			2.745	
738												
739				Normal GOF Test on Detects Only								
740				Shapiro Wilk Test Statistic	0.943			Shapiro Wilk GOF Test				
741				5% Shapiro Wilk Critical Value	0.829			Detected Data appear Normal at 5% Significance Level				
742				Lilliefors Test Statistic	0.167			Lilliefors GOF Test				

	A	B	C	D	E	F	G	H	I	J	K	L
743				5% Lilliefors Critical Value		0.274	Detected Data appear Normal at 5% Significance Level					
744	Detected Data appear Normal at 5% Significance Level											
745												
746	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
747				KM Mean		0.496				KM SD		0.205
748				95% UTL95% Coverage		0.951				95% KM UPL (t)		0.85
749				90% KM Percentile (z)		0.758				95% KM Percentile (z)		0.833
750				99% KM Percentile (z)		0.973				95% KM USL		1.058
751												
752	DL/2 Substitution Background Statistics Assuming Normal Distribution											
753				Mean		0.457				SD		0.259
754				95% UTL95% Coverage		1.031				95% UPL (t)		0.904
755				90% Percentile (z)		0.789				95% Percentile (z)		0.883
756				99% Percentile (z)		1.059				95% USL		1.167
757	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
758												
759	Gamma GOF Tests on Detected Observations Only											
760				A-D Test Statistic		0.212	Anderson-Darling GOF Test					
761				5% A-D Critical Value		0.721	Detected data appear Gamma Distributed at 5% Significance Level					
762				K-S Test Statistic		0.15	Kolmogorov-Smirnov GOF					
763				5% K-S Critical Value		0.279	Detected data appear Gamma Distributed at 5% Significance Level					
764	Detected data appear Gamma Distributed at 5% Significance Level											
765												
766	Gamma Statistics on Detected Data Only											
767				k hat (MLE)		17.99				k star (bias corrected MLE)		12.06
768				Theta hat (MLE)		0.0401				Theta star (bias corrected MLE)		0.0598
769				nu hat (MLE)		323.7				nu star (bias corrected)		217.2
770				MLE Mean (bias corrected)		0.722						
771				MLE Sd (bias corrected)		0.208				95% Percentile of Chisquare (2kstar)		36.57
772												
773	Gamma ROS Statistics using Imputed Non-Detects											
774	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
775	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
776	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
777	This is especially true when the sample size is small.											
778	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
779				Minimum		0.21				Mean		0.454
780				Maximum		1.09				Median		0.389
781				SD		0.21				CV		0.462
782				k hat (MLE)		6.029				k star (bias corrected MLE)		5.448
783				Theta hat (MLE)		0.0754				Theta star (bias corrected MLE)		0.0834
784				nu hat (MLE)		361.7				nu star (bias corrected)		326.9
785				MLE Mean (bias corrected)		0.454				MLE Sd (bias corrected)		0.195
786				95% Percentile of Chisquare (2kstar)		19.53				90% Percentile		0.715
787				95% Percentile		0.815				99% Percentile		1.025
788	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
789	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
790					WH	HW					WH	HW
791				95% Approx. Gamma UTL with 95% Coverage	0.97	0.98				95% Approx. Gamma UPL	0.824	0.826
792				95% Gamma USL	1.143	1.167						
793												
794	Estimates of Gamma Parameters using KM Estimates											
795				Mean (KM)		0.496				SD (KM)		0.205

796				Variance (KM)	0.042				SE of Mean (KM)		0.0449	
797				k hat (KM)	5.852				k star (KM)		5.289	
798				nu hat (KM)	351.1				nu star (KM)		317.3	
799				theta hat (KM)	0.0847				theta star (KM)		0.0937	
800				80% gamma percentile (KM)	0.662				90% gamma percentile (KM)		0.784	
801				95% gamma percentile (KM)	0.895				99% gamma percentile (KM)		1.129	
802												
803	The following statistics are computed using gamma distribution and KM estimates											
804	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
805					WH	HW				WH	HW	
806	95% Approx. Gamma UTL with 95% Coverage				0.994	1.002			95% Approx. Gamma UPL	0.856	0.857	
807				95% KM Gamma Percentile	0.834	0.835			95% Gamma USL	1.157	1.177	
808												
809	Lognormal GOF Test on Detected Observations Only											
810				Shapiro Wilk Test Statistic	0.98	Shapiro Wilk GOF Test						
811				5% Shapiro Wilk Critical Value	0.829	Detected Data appear Lognormal at 5% Significance Level						
812				Lilliefors Test Statistic	0.132	Lilliefors GOF Test						
813				5% Lilliefors Critical Value	0.274	Detected Data appear Lognormal at 5% Significance Level						
814	Detected Data appear Lognormal at 5% Significance Level											
815												
816	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
817				Mean in Original Scale	0.497				Mean in Log Scale		-0.75	
818				SD in Original Scale	0.182				SD in Log Scale		0.307	
819				95% UTL95% Coverage	0.934				95% BCA UTL95% Coverage		1.09	
820				95% Bootstrap (%) UTL95% Coverage	1.09				95% UPL (t)		0.803	
821				90% Percentile (z)	0.7				95% Percentile (z)		0.783	
822				99% Percentile (z)	0.965				95% USL		1.098	
823												
824	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
825				KM Mean of Logged Data	-0.773				95% KM UTL (Lognormal)95% Coverage		1.033	
826				KM SD of Logged Data	0.363				95% KM UPL (Lognormal)		0.864	
827				95% KM Percentile Lognormal (z)	0.839				95% KM USL (Lognormal)		1.25	
828												
829	Background DL/2 Statistics Assuming Lognormal Distribution											
830				Mean in Original Scale	0.457				Mean in Log Scale		-0.939	
831				SD in Original Scale	0.259				SD in Log Scale		0.575	
832				95% UTL95% Coverage	1.4				95% UPL (t)		1.055	
833				90% Percentile (z)	0.817				95% Percentile (z)		1.006	
834				99% Percentile (z)	1.489				95% USL		1.894	
835	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
836												
837	Nonparametric Distribution Free Background Statistics											
838	Data appear to follow a Discernible Distribution at 5% Significance Level											
839												
840	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
841				Order of Statistic, r	30				95% UTL with95% Coverage		1.88	
842				Approx, f used to compute achieved CC	1.579	pproximate Actual Confidence Coefficient achieved by UTL					0.785	
843	Approximate Sample Size needed to achieve specified CC				59				95% UPL		1.534	
844				95% USL	1.88				95% KM Chebyshev UPL		1.404	
845												
846	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
847	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
848	and consists of observations collected from clean unimpacted locations.											

849	The use of USL tends to provide a balance between false positives and false negatives provided the data										
850	represents a background data set and when many onsite observations need to be compared with the BTV.										
851											
852	Se										
853											
854	General Statistics										
855					Total Number of Observations	34			Number of Missing Observations	0	
856					Number of Distinct Observations	10					
857					Number of Detects	10			Number of Non-Detects	24	
858					Number of Distinct Detects	9			Number of Distinct Non-Detects	1	
859					Minimum Detect	0.006			Minimum Non-Detect	0.005	
860					Maximum Detect	0.0106			Maximum Non-Detect	0.005	
861					Variance Detected	3.2486E-6			Percent Non-Detects	70.59%	
862					Mean Detected	0.00852			SD Detected	0.0018	
863					Mean of Detected Logged Data	-4.786			SD of Detected Logged Data	0.22	
864											
865	Critical Values for Background Threshold Values (BTVs)										
866					Tolerance Factor K (For UTL)	2.166			d2max (for USL)	2.799	
867											
868	Normal GOF Test on Detects Only										
869					Shapiro Wilk Test Statistic	0.888			Shapiro Wilk GOF Test		
870					5% Shapiro Wilk Critical Value	0.842			Detected Data appear Normal at 5% Significance Level		
871					Lilliefors Test Statistic	0.188			Lilliefors GOF Test		
872					5% Lilliefors Critical Value	0.262			Detected Data appear Normal at 5% Significance Level		
873	Detected Data appear Normal at 5% Significance Level										
874											
875	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
876					KM Mean	0.00604			KM SD	0.00185	
877					95% UTL95% Coverage	0.0101			95% KM UPL (t)	0.00922	
878					90% KM Percentile (z)	0.00841			95% KM Percentile (z)	0.00909	
879					99% KM Percentile (z)	0.0103			95% KM USL	0.0112	
880											
881	DL/2 Substitution Background Statistics Assuming Normal Distribution										
882					Mean	0.00427			SD	0.00294	
883					95% UTL95% Coverage	0.0106			95% UPL (t)	0.00932	
884					90% Percentile (z)	0.00804			95% Percentile (z)	0.00911	
885					99% Percentile (z)	0.0111			95% USL	0.0125	
886	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
887											
888	Gamma GOF Tests on Detected Observations Only										
889					A-D Test Statistic	0.529			Anderson-Darling GOF Test		
890					5% A-D Critical Value	0.725			Detected data appear Gamma Distributed at 5% Significance Level		
891					K-S Test Statistic	0.201			Kolmogorov-Smirnov GOF		
892					5% K-S Critical Value	0.266			Detected data appear Gamma Distributed at 5% Significance Level		
893	Detected data appear Gamma Distributed at 5% Significance Level										
894											
895	Gamma Statistics on Detected Data Only										
896					k hat (MLE)	23.73			k star (bias corrected MLE)	16.67	
897					Theta hat (MLE)	3.5922E-4			Theta star (bias corrected MLE)	5.1113E-4	
898					nu hat (MLE)	474.5			nu star (bias corrected)	333.5	
899					MLE Mean (bias corrected)	0.00852					
900					MLE Sd (bias corrected)	0.00209			95% Percentile of Chisquare (2kstar)	47.82	
901											

	A	B	C	D	E	F	G	H	I	J	K	L
902	Gamma ROS Statistics using Imputed Non-Detects											
903	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
904	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
905	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
906	This is especially true when the sample size is small.											
907	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
908					Minimum	0.006				Mean	0.00957	
909					Maximum	0.0106				Median	0.01	
910					SD	0.00116				CV	0.122	
911					k hat (MLE)	56.77				k star (bias corrected MLE)	51.78	
912					Theta hat (MLE)	1.6850E-4				Theta star (bias corrected MLE)	1.8474E-4	
913					nu hat (MLE)	3860				nu star (bias corrected)	3521	
914					MLE Mean (bias corrected)	0.00957				MLE Sd (bias corrected)	0.00133	
915					95% Percentile of Chisquare (2kstar)	128.3				90% Percentile	0.0113	
916					95% Percentile	0.0119				99% Percentile	0.0129	
917	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
918	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
919					WH	HW				WH	HW	
920				95% Approx. Gamma UTL with 95% Coverage	0.0126	0.0126			95% Approx. Gamma UPL	0.0119	0.0119	
921				95% Gamma USL	0.0136	0.0137						
922												
923	Estimates of Gamma Parameters using KM Estimates											
924					Mean (KM)	0.00604				SD (KM)	0.00185	
925					Variance (KM)	3.4367E-6				SE of Mean (KM)	3.3513E-4	
926					k hat (KM)	10.6				k star (KM)	9.686	
927					nu hat (KM)	720.9				nu star (KM)	658.6	
928					theta hat (KM)	5.6935E-4				theta star (KM)	6.2318E-4	
929					80% gamma percentile (KM)	0.00758				90% gamma percentile (KM)	0.00862	
930					95% gamma percentile (KM)	0.00954				99% gamma percentile (KM)	0.0114	
931												
932	The following statistics are computed using gamma distribution and KM estimates											
933	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
934					WH	HW				WH	HW	
935				95% Approx. Gamma UTL with 95% Coverage	0.0101	0.0101			95% Approx. Gamma UPL	0.00912	0.00911	
936				95% KM Gamma Percentile	0.00897	0.00895			95% Gamma USL	0.0117	0.0118	
937												
938	Lognormal GOF Test on Detected Observations Only											
939					Shapiro Wilk Test Statistic	0.884			Shapiro Wilk GOF Test			
940					5% Shapiro Wilk Critical Value	0.842			Detected Data appear Lognormal at 5% Significance Level			
941					Lilliefors Test Statistic	0.198			Lilliefors GOF Test			
942					5% Lilliefors Critical Value	0.262			Detected Data appear Lognormal at 5% Significance Level			
943	Detected Data appear Lognormal at 5% Significance Level											
944												
945	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
946					Mean in Original Scale	0.00538				Mean in Log Scale	-5.324	
947					SD in Original Scale	0.00247				SD in Log Scale	0.452	
948					95% UTL95% Coverage	0.013				95% BCA UTL95% Coverage	0.0106	
949					95% Bootstrap (%) UTL95% Coverage	0.0106				95% UPL (t)	0.0106	
950					90% Percentile (z)	0.00869				95% Percentile (z)	0.0102	
951					99% Percentile (z)	0.0139				95% USL	0.0173	
952												
953	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
954					KM Mean of Logged Data	-5.148				95% KM UTL (Lognormal)95% Coverage	0.0102	

955				KM SD of Logged Data		0.259				95% KM UPL (Lognormal)		0.00907
956				95% KM Percentile Lognormal (z)		0.00891				95% KM USL (Lognormal)		0.012
957												
958						Background DL/2 Statistics Assuming Lognormal Distribution							
959				Mean in Original Scale		0.00427				Mean in Log Scale		-5.637
960				SD in Original Scale		0.00294				SD in Log Scale		0.569
961				95% UTL95% Coverage		0.0122				95% UPL (t)		0.00947
962				90% Percentile (z)		0.00739				95% Percentile (z)		0.00909
963				99% Percentile (z)		0.0134				95% USL		0.0175
964						DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.						
965												
966						Nonparametric Distribution Free Background Statistics						
967						Data appear to follow a Discernible Distribution at 5% Significance Level						
968												
969						Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)						
970				Order of Statistic, r		34				95% UTL with95% Coverage		0.0106
971				Approx, f used to compute achieved CC		1.789				pproximate Actual Confidence Coefficient achieved by UTL		0.825
972				Approximate Sample Size needed to achieve specified CC		59				95% UPL		0.0106
973				95% USL		0.0106				95% KM Chebyshev UPL		0.0142
974												
975						Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
976						Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
977						and consists of observations collected from clean unimpacted locations.						
978						The use of USL tends to provide a balance between false positives and false negatives provided the data						
979						represents a background data set and when many onsite observations need to be compared with the BTV.						
980												
981	Th											
982												
983						General Statistics						
984				Total Number of Observations		30				Number of Missing Observations		4
985				Number of Distinct Observations		1						
986				Number of Detects		0				Number of Non-Detects		30
987				Number of Distinct Detects		0				Number of Distinct Non-Detects		1
988				Minimum Detect		N/A				Minimum Non-Detect		0.001
989				Maximum Detect		N/A				Maximum Non-Detect		0.001
990				Variance Detected		N/A				Percent Non-Detects		100%
991				Mean Detected		N/A				SD Detected		N/A
992				Mean of Detected Logged Data		N/A				SD of Detected Logged Data		N/A
993												
994						Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!						
995						Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!						
996						The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).						
997												
998						The data set for variable Th was not processed!						
999												
1000												

1			Background Statistics for Data Sets with Non-Detects								
2		User Selected Options									
3		Date/Time of Computation	ProUCL 5.110/13/2022 8:50:49 AM								
4		From File	LRS_ProUCL_UPL_Input_2021_v1_a.xls								
5		Full Precision	OFF								
6		Confidence Coefficient	95%								
7		Coverage	95%								
8		)ifferent or Future K Observations	1								
9		Number of Bootstrap Operations	2000								
10											
11	B										
12											
13	General Statistics										
14			Total Number of Observations	30			Number of Distinct Observations	22			
15							Number of Missing Observations	2			
16			Minimum	0.17			First Quartile	0.189			
17			Second Largest	0.31			Median	0.235			
18			Maximum	0.313			Third Quartile	0.292			
19			Mean	0.238			SD	0.0538			
20			Coefficient of Variation	0.226			Skewness	0.0741			
21			Mean of logged Data	-1.46			SD of logged Data	0.229			
22											
23			Critical Values for Background Threshold Values (BTVs)								
24			Tolerance Factor K (For UTL)	2.22			d2max (for USL)	2.745			
25											
26			Normal GOF Test								
27			Shapiro Wilk Test Statistic	0.816			Shapiro Wilk GOF Test				
28			5% Shapiro Wilk Critical Value	0.927			Data Not Normal at 5% Significance Level				
29			Lilliefors Test Statistic	0.238			Lilliefors GOF Test				
30			5% Lilliefors Critical Value	0.159			Data Not Normal at 5% Significance Level				
31			Data Not Normal at 5% Significance Level								
32											
33			Background Statistics Assuming Normal Distribution								
34			95% UTL with 95% Coverage	0.358			90% Percentile (z)	0.307			
35			95% UPL (t)	0.331			95% Percentile (z)	0.327			
36			95% USL	0.386			99% Percentile (z)	0.363			
37											
38			Gamma GOF Test								
39			A-D Test Statistic	2.409			Anderson-Darling Gamma GOF Test				
40			5% A-D Critical Value	0.744			Data Not Gamma Distributed at 5% Significance Level				
41			K-S Test Statistic	0.237			Kolmogorov-Smirnov Gamma GOF Test				
42			5% K-S Critical Value	0.16			Data Not Gamma Distributed at 5% Significance Level				
43			Data Not Gamma Distributed at 5% Significance Level								
44											
45			Gamma Statistics								
46			k hat (MLE)	20.06			k star (bias corrected MLE)	18.08			
47			Theta hat (MLE)	0.0119			Theta star (bias corrected MLE)	0.0132			
48			nu hat (MLE)	1204			nu star (bias corrected)	1085			
49			MLE Mean (bias corrected)	0.238			MLE Sd (bias corrected)	0.056			
50											
51			Background Statistics Assuming Gamma Distribution								
52			95% Wilson Hilferty (WH) Approx. Gamma UPL	0.339			90% Percentile	0.312			
53			95% Hawkins Wixley (HW) Approx. Gamma UPL	0.341			95% Percentile	0.337			

	A	B	C	D	E	F	G	H	I	J	K	L
54	95% WH Approx. Gamma UTL with 95% Coverage					0.374				99% Percentile		0.387
55	95% HW Approx. Gamma UTL with 95% Coverage					0.377						
56					95% WH USL	0.414				95% HW USL		0.419
57												
58	Lognormal GOF Test											
59					Shapiro Wilk Test Statistic	0.816	Shapiro Wilk Lognormal GOF Test					
60					5% Shapiro Wilk Critical Value	0.927	Data Not Lognormal at 5% Significance Level					
61					Lilliefors Test Statistic	0.231	Lilliefors Lognormal GOF Test					
62					5% Lilliefors Critical Value	0.159	Data Not Lognormal at 5% Significance Level					
63	Data Not Lognormal at 5% Significance Level											
64												
65	Background Statistics assuming Lognormal Distribution											
66				95% UTL with 95% Coverage		0.386				90% Percentile (z)		0.311
67					95% UPL (t)	0.345				95% Percentile (z)		0.338
68					95% USL	0.435				99% Percentile (z)		0.396
69												
70	Nonparametric Distribution Free Background Statistics											
71	Data do not follow a Discernible Distribution (0.05)											
72												
73	Nonparametric Upper Limits for Background Threshold Values											
74					Order of Statistic, r	30				95% UTL with 95% Coverage		0.313
75					Approx, f used to compute achieved CC	1.579				pproximate Actual Confidence Coefficient achieved by UTL		0.785
76										Approximate Sample Size needed to achieve specified CC		59
77				95% Percentile Bootstrap UTL with 95% Coverage		0.313				95% BCA Bootstrap UTL with 95% Coverage		0.313
78					95% UPL	0.311				90% Percentile		0.305
79					90% Chebyshev UPL	0.402				95% Percentile		0.308
80					95% Chebyshev UPL	0.476				99% Percentile		0.312
81					95% USL	0.313						
82												
83	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
84	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
85	and consists of observations collected from clean unimpacted locations.											
86	The use of USL tends to provide a balance between false positives and false negatives provided the data											
87	represents a background data set and when many onsite observations need to be compared with the BTV.											
88												
89	Ca											
90												
91	General Statistics											
92					Total Number of Observations	30				Number of Distinct Observations		16
93										Number of Missing Observations		2
94					Minimum	170				First Quartile		181
95					Second Largest	203				Median		190
96					Maximum	210				Third Quartile		199.5
97					Mean	190				SD		10.61
98					Coefficient of Variation	0.0559				Skewness		-0.328
99					Mean of logged Data	5.245				SD of logged Data		0.0565
100												
101	Critical Values for Background Threshold Values (BTVs)											
102					Tolerance Factor K (For UTL)	2.22				d2max (for USL)		2.745
103												
104	Normal GOF Test											
105					Shapiro Wilk Test Statistic	0.944	Shapiro Wilk GOF Test					
106					5% Shapiro Wilk Critical Value	0.927	Data appear Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
107					Lilliefors Test Statistic	0.133	Lilliefors GOF Test					
108					5% Lilliefors Critical Value	0.159	Data appear Normal at 5% Significance Level					
109	Data appear Normal at 5% Significance Level											
110												
111	Background Statistics Assuming Normal Distribution											
112				95% UTL with	95% Coverage	213.6				90% Percentile (z)	203.6	
113					95% UPL (t)	208.3				95% Percentile (z)	207.5	
114					95% USL	219.1				99% Percentile (z)	214.7	
115												
116	Gamma GOF Test											
117					A-D Test Statistic	0.656	Anderson-Darling Gamma GOF Test					
118					5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level					
119					K-S Test Statistic	0.141	Kolmogorov-Smirnov Gamma GOF Test					
120					5% K-S Critical Value	0.16	Detected data appear Gamma Distributed at 5% Significance Level					
121	Detected data appear Gamma Distributed at 5% Significance Level											
122												
123	Gamma Statistics											
124					k hat (MLE)	326.9				k star (bias corrected MLE)	294.2	
125					Theta hat (MLE)	0.581				Theta star (bias corrected MLE)	0.646	
126					nu hat (MLE)	19612				nu star (bias corrected)	17652	
127					MLE Mean (bias corrected)	190				MLE Sd (bias corrected)	11.08	
128												
129	Background Statistics Assuming Gamma Distribution											
130				95% Wilson Hilferty (WH) Approx. Gamma UPL		208.9				90% Percentile	204.3	
131				95% Hawkins Wixley (HW) Approx. Gamma UPL		208.9				95% Percentile	208.6	
132				95% WH Approx. Gamma UTL with	95% Coverage	214.5				99% Percentile	216.7	
133				95% HW Approx. Gamma UTL with	95% Coverage	214.7						
134					95% WH USL	220.7				95% HW USL	220.9	
135												
136	Lognormal GOF Test											
137					Shapiro Wilk Test Statistic	0.938	Shapiro Wilk Lognormal GOF Test					
138					5% Shapiro Wilk Critical Value	0.927	Data appear Lognormal at 5% Significance Level					
139					Lilliefors Test Statistic	0.144	Lilliefors Lognormal GOF Test					
140					5% Lilliefors Critical Value	0.159	Data appear Lognormal at 5% Significance Level					
141	Data appear Lognormal at 5% Significance Level											
142												
143	Background Statistics assuming Lognormal Distribution											
144				95% UTL with	95% Coverage	215.1				90% Percentile (z)	204	
145					95% UPL (t)	209.2				95% Percentile (z)	208.2	
146					95% USL	221.5				99% Percentile (z)	216.4	
147												
148	Nonparametric Distribution Free Background Statistics											
149	Data appear Normal at 5% Significance Level											
150												
151	Nonparametric Upper Limits for Background Threshold Values											
152					Order of Statistic, r	30				95% UTL with	95% Coverage	210
153					Approx, f used to compute achieved CC	1.579				pproximate Actual Confidence Coefficient achieved by UTL		0.785
154										Approximate Sample Size needed to achieve specified CC		59
155				95% Percentile Bootstrap UTL with	95% Coverage	210				95% BCA Bootstrap UTL with	95% Coverage	206.9
156					95% UPL	206.2				90% Percentile	202	
157					90% Chebyshev UPL	222.4				95% Percentile	202.6	
158					95% Chebyshev UPL	237				99% Percentile	208	
159					95% USL	210						

160											
161	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
162	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
163	and consists of observations collected from clean unimpacted locations.										
164	The use of USL tends to provide a balance between false positives and false negatives provided the data										
165	represents a background data set and when many onsite observations need to be compared with the BTV.										
166											
167	CI										
168											
169	General Statistics										
170					Total Number of Observations	30			Number of Distinct Observations	19	
171									Number of Missing Observations	2	
172					Minimum	40.7			First Quartile	46	
173					Second Largest	94.3			Median	66.45	
174					Maximum	97.1			Third Quartile	84	
175					Mean	66.14			SD	21.26	
176					Coefficient of Variation	0.321			Skewness	0.0611	
177					Mean of logged Data	4.14			SD of logged Data	0.332	
178											
179	Critical Values for Background Threshold Values (BTVs)										
180					Tolerance Factor K (For UTL)	2.22			d2max (for USL)	2.745	
181											
182	Normal GOF Test										
183					Shapiro Wilk Test Statistic	0.77			Shapiro Wilk GOF Test		
184					5% Shapiro Wilk Critical Value	0.927			Data Not Normal at 5% Significance Level		
185					Lilliefors Test Statistic	0.286			Lilliefors GOF Test		
186					5% Lilliefors Critical Value	0.159			Data Not Normal at 5% Significance Level		
187	Data Not Normal at 5% Significance Level										
188											
189	Background Statistics Assuming Normal Distribution										
190					95% UTL with 95% Coverage	113.3			90% Percentile (z)	93.38	
191					95% UPL (t)	102.9			95% Percentile (z)	101.1	
192					95% USL	124.5			99% Percentile (z)	115.6	
193											
194	Gamma GOF Test										
195					A-D Test Statistic	3.39			Anderson-Darling Gamma GOF Test		
196					5% A-D Critical Value	0.746			Data Not Gamma Distributed at 5% Significance Level		
197					K-S Test Statistic	0.3			Kolmogorov-Smirnov Gamma GOF Test		
198					5% K-S Critical Value	0.16			Data Not Gamma Distributed at 5% Significance Level		
199	Data Not Gamma Distributed at 5% Significance Level										
200											
201	Gamma Statistics										
202					k hat (MLE)	9.729			k star (bias corrected MLE)	8.779	
203					Theta hat (MLE)	6.798			Theta star (bias corrected MLE)	7.534	
204					nu hat (MLE)	583.8			nu star (bias corrected)	526.7	
205					MLE Mean (bias corrected)	66.14			MLE Sd (bias corrected)	22.32	
206											
207	Background Statistics Assuming Gamma Distribution										
208					95% Wilson Hilferty (WH) Approx. Gamma UPL	107.7			90% Percentile	95.87	
209					95% Hawkins Wixley (HW) Approx. Gamma UPL	108.5			95% Percentile	106.6	
210					95% WH Approx. Gamma UTL with 95% Coverage	123.1			99% Percentile	128.8	
211					95% HW Approx. Gamma UTL with 95% Coverage	124.9					
212					95% WH USL	141.1			95% HW USL	144.2	

213											
214					Lognormal GOF Test						
215				Shapiro Wilk Test Statistic	0.767	Shapiro Wilk Lognormal GOF Test					
216				5% Shapiro Wilk Critical Value	0.927	Data Not Lognormal at 5% Significance Level					
217				Lilliefors Test Statistic	0.3	Lilliefors Lognormal GOF Test					
218				5% Lilliefors Critical Value	0.159	Data Not Lognormal at 5% Significance Level					
219					Data Not Lognormal at 5% Significance Level						
220											
221					Background Statistics assuming Lognormal Distribution						
222				95% UTL with 95% Coverage	131.1	90% Percentile (z)	96.01				
223				95% UPL (t)	111.3	95% Percentile (z)	108.3				
224				95% USL	156	99% Percentile (z)	135.8				
225											
226					Nonparametric Distribution Free Background Statistics						
227					Data do not follow a Discernible Distribution (0.05)						
228											
229					Nonparametric Upper Limits for Background Threshold Values						
230				Order of Statistic, r	30	95% UTL with 95% Coverage	97.1				
231				Approx, f used to compute achieved CC	1.579	pproximate Actual Confidence Coefficient achieved by UTL	0.785				
232						Approximate Sample Size needed to achieve specified CC	59				
233				95% Percentile Bootstrap UTL with 95% Coverage	97.1	95% BCA Bootstrap UTL with 95% Coverage	95.84				
234				95% UPL	95.56	90% Percentile	89.98				
235				90% Chebyshev UPL	131	95% Percentile	94.3				
236				95% Chebyshev UPL	160.3	99% Percentile	96.29				
237				95% USL	97.1						
238											
239					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.						
240					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers						
241					and consists of observations collected from clean unimpacted locations.						
242					The use of USL tends to provide a balance between false positives and false negatives provided the data						
243					represents a background data set and when many onsite observations need to be compared with the BTV.						
244											
245	F										
246											
247					General Statistics						
248				Total Number of Observations	32	Number of Missing Observations	0				
249				Number of Distinct Observations	17						
250				Number of Detects	22	Number of Non-Detects	10				
251				Number of Distinct Detects	16	Number of Distinct Non-Detects	1				
252				Minimum Detect	0.53	Minimum Non-Detect	0.5				
253				Maximum Detect	1.19	Maximum Non-Detect	0.5				
254				Variance Detected	0.0169	Percent Non-Detects	31.25%				
255				Mean Detected	0.656	SD Detected	0.13				
256				Mean of Detected Logged Data	-0.435	SD of Detected Logged Data	0.158				
257											
258					Critical Values for Background Threshold Values (BTVs)						
259				Tolerance Factor K (For UTL)	2.186	d2max (for USL)	2.773				
260											
261					Normal GOF Test on Detects Only						
262				Shapiro Wilk Test Statistic	0.573	Shapiro Wilk GOF Test					
263				5% Shapiro Wilk Critical Value	0.911	Data Not Normal at 5% Significance Level					
264				Lilliefors Test Statistic	0.352	Lilliefors GOF Test					
265				5% Lilliefors Critical Value	0.184	Data Not Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
266	Data Not Normal at 5% Significance Level											
267												
268	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
269					KM Mean	0.607				KM SD	0.128	
270					95% UTL95% Coverage	0.887				95% KM UPL (t)	0.828	
271					90% KM Percentile (z)	0.771				95% KM Percentile (z)	0.818	
272					99% KM Percentile (z)	0.905				95% KM USL	0.962	
273												
274	DL/2 Substitution Background Statistics Assuming Normal Distribution											
275					Mean	0.529				SD	0.219	
276					95% UTL95% Coverage	1.009				95% UPL (t)	0.907	
277					90% Percentile (z)	0.81				95% Percentile (z)	0.89	
278					99% Percentile (z)	1.039				95% USL	1.137	
279	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
280												
281	Gamma GOF Tests on Detected Observations Only											
282					A-D Test Statistic	2.487				Anderson-Darling GOF Test		
283					5% A-D Critical Value	0.742				Data Not Gamma Distributed at 5% Significance Level		
284					K-S Test Statistic	0.328				Kolmogorov-Smirnov GOF		
285					5% K-S Critical Value	0.185				Data Not Gamma Distributed at 5% Significance Level		
286	Data Not Gamma Distributed at 5% Significance Level											
287												
288	Gamma Statistics on Detected Data Only											
289					k hat (MLE)	36.32				k star (bias corrected MLE)	31.4	
290					Theta hat (MLE)	0.0181				Theta star (bias corrected MLE)	0.0209	
291					nu hat (MLE)	1598				nu star (bias corrected)	1381	
292					MLE Mean (bias corrected)	0.656						
293					MLE Sd (bias corrected)	0.117				95% Percentile of Chisquare (2kstar)	82.29	
294												
295	Gamma ROS Statistics using Imputed Non-Detects											
296	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
297	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
298	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
299	This is especially true when the sample size is small.											
300	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
301					Minimum	0.322				Mean	0.584	
302					Maximum	1.19				Median	0.602	
303					SD	0.156				CV	0.266	
304					k hat (MLE)	16.25				k star (bias corrected MLE)	14.75	
305					Theta hat (MLE)	0.0359				Theta star (bias corrected MLE)	0.0396	
306					nu hat (MLE)	1040				nu star (bias corrected)	943.9	
307					MLE Mean (bias corrected)	0.584				MLE Sd (bias corrected)	0.152	
308					95% Percentile of Chisquare (2kstar)	43.16				90% Percentile	0.786	
309					95% Percentile	0.855				99% Percentile	0.995	
310	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
311	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
312						WH	HW				WH	HW
313					95% Approx. Gamma UTL with 95% Coverage	0.951	0.957			95% Approx. Gamma UPL	0.86	0.862
314					95% Gamma USL	1.076	1.088					
315												
316	Estimates of Gamma Parameters using KM Estimates											
317					Mean (KM)	0.607				SD (KM)	0.128	
318					Variance (KM)	0.0164				SE of Mean (KM)	0.0231	

	A	B	C	D	E	F	G	H	I	J	K	L
319					k hat (KM)	22.56					k star (KM)	20.46
320					nu hat (KM)	1444					nu star (KM)	1310
321					theta hat (KM)	0.0269					theta star (KM)	0.0297
322					80% gamma percentile (KM)	0.717					90% gamma percentile (KM)	0.785
323					95% gamma percentile (KM)	0.844					99% gamma percentile (KM)	0.963
324												
325	The following statistics are computed using gamma distribution and KM estimates											
326	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
327					WH	HW					WH	HW
328	95% Approx. Gamma UTL with 95% Coverage				0.878	0.877	95% Approx. Gamma UPL				0.813	0.811
329	95% KM Gamma Percentile				0.802	0.801	95% Gamma USL				0.964	0.966
330												
331	Lognormal GOF Test on Detected Observations Only											
332	Shapiro Wilk Test Statistic					0.686	Shapiro Wilk GOF Test					
333	5% Shapiro Wilk Critical Value					0.911	Data Not Lognormal at 5% Significance Level					
334	Lilliefors Test Statistic					0.314	Lilliefors GOF Test					
335	5% Lilliefors Critical Value					0.184	Data Not Lognormal at 5% Significance Level					
336	Data Not Lognormal at 5% Significance Level											
337												
338	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
339	Mean in Original Scale					0.597	Mean in Log Scale					-0.538
340	SD in Original Scale					0.141	SD in Log Scale					0.208
341	95% UTL95% Coverage					0.92	95% BCA UTL95% Coverage					1.19
342	95% Bootstrap (%) UTL95% Coverage					1.19	95% UPL (t)					0.835
343	90% Percentile (z)					0.762	95% Percentile (z)					0.822
344	99% Percentile (z)					0.947	95% USL					1.04
345												
346	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
347	KM Mean of Logged Data					-0.516	95% KM UTL (Lognormal)95% Coverage					0.876
348	KM SD of Logged Data					0.175	95% KM UPL (Lognormal)					0.808
349	95% KM Percentile Lognormal (z)					0.797	95% KM USL (Lognormal)					0.971
350												
351	Background DL/2 Statistics Assuming Lognormal Distribution											
352	Mean in Original Scale					0.529	Mean in Log Scale					-0.732
353	SD in Original Scale					0.219	SD in Log Scale					0.467
354	95% UTL95% Coverage					1.333	95% UPL (t)					1.074
355	90% Percentile (z)					0.874	95% Percentile (z)					1.036
356	99% Percentile (z)					1.423	95% USL					1.753
357	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
358												
359	Nonparametric Distribution Free Background Statistics											
360	Data do not follow a Discernible Distribution (0.05)											
361												
362	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
363	Order of Statistic, r					32	95% UTL with95% Coverage					1.19
364	Approx, f used to compute achieved CC					1.684	pproximate Actual Confidence Coefficient achieved by UTL					0.806
365	Approximate Sample Size needed to achieve specified CC					59	95% UPL					0.93
366	95% USL					1.19	95% KM Chebyshev UPL					1.174
367												
368	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
369	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
370	and consists of observations collected from clean unimpacted locations.											
371	The use of USL tends to provide a balance between false positives and false negatives provided the data											

represents a background data set and when many onsite observations need to be compared with the BTV.

pH

General Statistics

Total Number of Observations	32	Number of Distinct Observations	29
Minimum	6.37	First Quartile	7.168
Second Largest	7.6	Median	7.245
Maximum	7.7	Third Quartile	7.353
Mean	7.218	SD	0.261
Coefficient of Variation	0.0361	Skewness	-1.446
Mean of logged Data	1.976	SD of logged Data	0.0371

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.186	d2max (for USL)	2.773

Normal GOF Test

Shapiro Wilk Test Statistic	0.862	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.93	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.215	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.154	Data Not Normal at 5% Significance Level	

Data Not Normal at 5% Significance Level

Background Statistics Assuming Normal Distribution

95% UTL with 95% Coverage	7.788	90% Percentile (z)	7.552
95% UPL (t)	7.667	95% Percentile (z)	7.646
95% USL	7.941	99% Percentile (z)	7.824

Gamma GOF Test

A-D Test Statistic	1.775	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.745	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.218	Kolmogorov-Smirnov Gamma GOF Test	
5% K-S Critical Value	0.155	Data Not Gamma Distributed at 5% Significance Level	

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	764.1	k star (bias corrected MLE)	692.5
Theta hat (MLE)	0.00945	Theta star (bias corrected MLE)	0.0104
nu hat (MLE)	48903	nu star (bias corrected)	44320
MLE Mean (bias corrected)	7.218	MLE Sd (bias corrected)	0.274

Background Statistics Assuming Gamma Distribution

95% Wilson Hilferty (WH) Approx. Gamma UPL	7.681	90% Percentile	7.571
95% Hawkins Wixley (HW) Approx. Gamma UPL	7.683	95% Percentile	7.675
95% WH Approx. Gamma UTL with 95% Coverage	7.81	99% Percentile	7.871
95% HW Approx. Gamma UTL with 95% Coverage	7.813		
95% WH USL	7.975	95% HW USL	7.98

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.844	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.93	Data Not Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.224	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.154	Data Not Lognormal at 5% Significance Level	

425	Data Not Lognormal at 5% Significance Level										
426											
427	Background Statistics assuming Lognormal Distribution										
428				95% UTL with	95% Coverage	7.823			90% Percentile (z)	7.564	
429				95% UPL (t)		7.689			95% Percentile (z)	7.667	
430				95% USL		7.995			99% Percentile (z)	7.863	
431											
432	Nonparametric Distribution Free Background Statistics										
433	Data do not follow a Discernible Distribution (0.05)										
434											
435	Nonparametric Upper Limits for Background Threshold Values										
436				Order of Statistic, r		32			95% UTL with	95% Coverage	7.7
437				Approx, f used to compute achieved CC		1.684			pproximate Actual Confidence Coefficient achieved by UTL		0.806
438									Approximate Sample Size needed to achieve specified CC		59
439				95% Percentile Bootstrap UTL with	95% Coverage	7.7			95% BCA Bootstrap UTL with	95% Coverage	7.645
440				95% UPL		7.635			90% Percentile		7.488
441				90% Chebyshev UPL		8.012			95% Percentile		7.545
442				95% Chebyshev UPL		8.371			99% Percentile		7.669
443				95% USL		7.7					
444											
445	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
446	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
447	and consists of observations collected from clean unimpacted locations.										
448	The use of USL tends to provide a balance between false positives and false negatives provided the data										
449	represents a background data set and when many onsite observations need to be compared with the BTV.										
450											
451	SO										
452											
453	General Statistics										
454				Total Number of Observations		30			Number of Distinct Observations		20
455									Number of Missing Observations		2
456				Minimum		450			First Quartile		544
457				Second Largest		845			Median		724.5
458				Maximum		877			Third Quartile		830
459				Mean		691.9			SD		146
460				Coefficient of Variation		0.211			Skewness		-0.107
461				Mean of logged Data		6.517			SD of logged Data		0.218
462											
463	Critical Values for Background Threshold Values (BTVs)										
464				Tolerance Factor K (For UTL)		2.22			d2max (for USL)		2.745
465											
466	Normal GOF Test										
467				Shapiro Wilk Test Statistic		0.782			Shapiro Wilk GOF Test		
468				5% Shapiro Wilk Critical Value		0.927			Data Not Normal at 5% Significance Level		
469				Lilliefors Test Statistic		0.277			Lilliefors GOF Test		
470				5% Lilliefors Critical Value		0.159			Data Not Normal at 5% Significance Level		
471	Data Not Normal at 5% Significance Level										
472											
473	Background Statistics Assuming Normal Distribution										
474				95% UTL with	95% Coverage	1016			90% Percentile (z)	879	
475				95% UPL (t)		944.1			95% Percentile (z)	932	
476				95% USL		1093			99% Percentile (z)	1032	
477											

	A	B	C	D	E	F	G	H	I	J	K	L
478	Gamma GOF Test											
479				A-D Test Statistic		3.065	Anderson-Darling Gamma GOF Test					
480				5% A-D Critical Value		0.744	Data Not Gamma Distributed at 5% Significance Level					
481				K-S Test Statistic		0.282	Kolmogorov-Smirnov Gamma GOF Test					
482				5% K-S Critical Value		0.16	Data Not Gamma Distributed at 5% Significance Level					
483	Data Not Gamma Distributed at 5% Significance Level											
484												
485	Gamma Statistics											
486				k hat (MLE)		22.45	k star (bias corrected MLE)			20.22		
487				Theta hat (MLE)		30.82	Theta star (bias corrected MLE)			34.21		
488				nu hat (MLE)		1347	nu star (bias corrected)			1213		
489				MLE Mean (bias corrected)		691.9	MLE Sd (bias corrected)			153.8		
490												
491	Background Statistics Assuming Gamma Distribution											
492				95% Wilson Hilferty (WH) Approx. Gamma UPL		968.7	90% Percentile			894.9		
493				95% Hawkins Wixley (HW) Approx. Gamma UPL		972.5	95% Percentile			962.8		
494				95% WH Approx. Gamma UTL with 95% Coverage		1063	99% Percentile			1099		
495				95% HW Approx. Gamma UTL with 95% Coverage		1071						
496				95% WH USL		1171	95% HW USL			1184		
497												
498	Lognormal GOF Test											
499				Shapiro Wilk Test Statistic		0.79	Shapiro Wilk Lognormal GOF Test					
500				5% Shapiro Wilk Critical Value		0.927	Data Not Lognormal at 5% Significance Level					
501				Lilliefors Test Statistic		0.278	Lilliefors Lognormal GOF Test					
502				5% Lilliefors Critical Value		0.159	Data Not Lognormal at 5% Significance Level					
503	Data Not Lognormal at 5% Significance Level											
504												
505	Background Statistics assuming Lognormal Distribution											
506				95% UTL with 95% Coverage		1096	90% Percentile (z)			894		
507				95% UPL (t)		985	95% Percentile (z)			967.5		
508				95% USL		1229	99% Percentile (z)			1122		
509												
510	Nonparametric Distribution Free Background Statistics											
511	Data do not follow a Discernible Distribution (0.05)											
512												
513	Nonparametric Upper Limits for Background Threshold Values											
514				Order of Statistic, r		30	95% UTL with 95% Coverage			877		
515				Approx, f used to compute achieved CC		1.579	pproximate Actual Confidence Coefficient achieved by UTL			0.785		
516							Approximate Sample Size needed to achieve specified CC			59		
517				95% Percentile Bootstrap UTL with 95% Coverage		877	95% BCA Bootstrap UTL with 95% Coverage			862.6		
518				95% UPL		859.4	90% Percentile			840		
519				90% Chebyshev UPL		1137	95% Percentile			842.8		
520				95% Chebyshev UPL		1339	99% Percentile			867.7		
521				95% USL		877						
522												
523	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
524	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
525	and consists of observations collected from clean unimpacted locations.											
526	The use of USL tends to provide a balance between false positives and false negatives provided the data											
527	represents a background data set and when many onsite observations need to be compared with the BTV.											
528												
529	TDS											
530												

	A	B	C	D	E	F	G	H	I	J	K	L
531	General Statistics											
532					Total Number of Observations	30			Number of Distinct Observations			15
533									Number of Missing Observations			2
534					Minimum	400			First Quartile			1300
535					Second Largest	1830			Median			1530
536					Maximum	1840			Third Quartile			1760
537					Mean	1492			SD			323.9
538					Coefficient of Variation	0.217			Skewness			-1.317
539					Mean of logged Data	7.275			SD of logged Data			0.296
540												
541					Critical Values for Background Threshold Values (BTVs)							
542					Tolerance Factor K (For UTL)	2.22			d2max (for USL)			2.745
543												
544					Normal GOF Test							
545					Shapiro Wilk Test Statistic	0.824			Shapiro Wilk GOF Test			
546					5% Shapiro Wilk Critical Value	0.927			Data Not Normal at 5% Significance Level			
547					Lilliefors Test Statistic	0.239			Lilliefors GOF Test			
548					5% Lilliefors Critical Value	0.159			Data Not Normal at 5% Significance Level			
549					Data Not Normal at 5% Significance Level							
550												
551					Background Statistics Assuming Normal Distribution							
552				95% UTL with	95% Coverage	2211			90% Percentile (z)			1907
553					95% UPL (t)	2052			95% Percentile (z)			2025
554					95% USL	2382			99% Percentile (z)			2246
555												
556					Gamma GOF Test							
557					A-D Test Statistic	2.175			Anderson-Darling Gamma GOF Test			
558					5% A-D Critical Value	0.745			Data Not Gamma Distributed at 5% Significance Level			
559					K-S Test Statistic	0.231			Kolmogorov-Smirnov Gamma GOF Test			
560					5% K-S Critical Value	0.16			Data Not Gamma Distributed at 5% Significance Level			
561					Data Not Gamma Distributed at 5% Significance Level							
562												
563					Gamma Statistics							
564					k hat (MLE)	15.14			k star (bias corrected MLE)			13.65
565					Theta hat (MLE)	98.56			Theta star (bias corrected MLE)			109.3
566					nu hat (MLE)	908.5			nu star (bias corrected)			819
567					MLE Mean (bias corrected)	1492			MLE Sd (bias corrected)			403.9
568												
569					Background Statistics Assuming Gamma Distribution							
570				95% Wilson Hilferty (WH) Approx. Gamma UPL		2227			90% Percentile			2028
571				95% Hawkins Wixley (HW) Approx. Gamma UPL		2263			95% Percentile			2213
572				95% WH Approx. Gamma UTL with	95% Coverage	2486			99% Percentile			2589
573				95% HW Approx. Gamma UTL with	95% Coverage	2544						
574					95% WH USL	2783			95% HW USL			2872
575												
576					Lognormal GOF Test							
577					Shapiro Wilk Test Statistic	0.673			Shapiro Wilk Lognormal GOF Test			
578					5% Shapiro Wilk Critical Value	0.927			Data Not Lognormal at 5% Significance Level			
579					Lilliefors Test Statistic	0.262			Lilliefors Lognormal GOF Test			
580					5% Lilliefors Critical Value	0.159			Data Not Lognormal at 5% Significance Level			
581					Data Not Lognormal at 5% Significance Level							
582												
583					Background Statistics assuming Lognormal Distribution							

	A	B	C	D	E	F	G	H	I	J	K	L
584				95% UTL with	95% Coverage	2785				90% Percentile (z)		2110
585					95% UPL (t)	2407				95% Percentile (z)		2349
586					95% USL	3254				99% Percentile (z)		2874
587												
588					Nonparametric Distribution Free Background Statistics							
589					Data do not follow a Discernible Distribution (0.05)							
590												
591					Nonparametric Upper Limits for Background Threshold Values							
592					Order of Statistic, r	30				95% UTL with	95% Coverage	1840
593					Approx, f used to compute achieved CC	1.579				pproximate Actual Confidence Coefficient achieved by UTL		0.785
594										Approximate Sample Size needed to achieve specified CC		59
595			95% Percentile Bootstrap UTL with		95% Coverage	1840				95% BCA Bootstrap UTL with	95% Coverage	1836
596					95% UPL	1835				90% Percentile		1821
597					90% Chebyshev UPL	2480				95% Percentile		1830
598					95% Chebyshev UPL	2928				99% Percentile		1837
599					95% USL	1840						
600												
601					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
602					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
603					and consists of observations collected from clean unimpacted locations.							
604					The use of USL tends to provide a balance between false positives and false negatives provided the data							
605					represents a background data set and when many onsite observations need to be compared with the BTV.							
606												

	Background Statistics for Data Sets with Non-Detects	
User Selected Options		
Date/Time of Computation	ProUCL 5.110/13/2022 8:51:40 AM	
From File	LRS_ProUCL_UPL_Input_2021_v1_a.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Coverage	95%	
Different or Future K Observations	1	
Number of Bootstrap Operations	2000	

Sb

General Statistics

Total Number of Observations	30	Number of Missing Observations	2
Number of Distinct Observations	2		
Number of Detects	0	Number of Non-Detects	30
Number of Distinct Detects	0	Number of Distinct Non-Detects	2
Minimum Detect	N/A	Minimum Non-Detect	0.002
Maximum Detect	N/A	Maximum Non-Detect	0.02
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Sb was not processed!

As

General Statistics

Total Number of Observations	30	Number of Missing Observations	2
Number of Distinct Observations	3		
Number of Detects	1	Number of Non-Detects	29
Number of Distinct Detects	1	Number of Distinct Non-Detects	2
Minimum Detect	0.0057	Minimum Non-Detect	0.005
Maximum Detect	0.0057	Maximum Non-Detect	0.05
Variance Detected	N/A	Percent Non-Detects	96.67%
Mean Detected	0.0057	SD Detected	N/A
Mean of Detected Logged Data	-5.167	SD of Detected Logged Data	N/A

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

s suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BT

The data set for variable As was not processed!

Ba

General Statistics

Total Number of Observations	32	Number of Distinct Observations	30

54				Minimum	0.0309				First Quartile		0.0351
55				Second Largest	0.077				Median		0.0403
56				Maximum	0.11				Third Quartile		0.0503
57				Mean	0.0464				SD		0.0169
58				Coefficient of Variation	0.364				Skewness		2.133
59				Mean of logged Data	-3.12				SD of logged Data		0.3
60											
61				Critical Values for Background Threshold Values (BTVs)							
62				Tolerance Factor K (For UTL)	2.186				d2max (for USL)		2.773
63											
64				Normal GOF Test							
65				Shapiro Wilk Test Statistic	0.78				Shapiro Wilk GOF Test		
66				5% Shapiro Wilk Critical Value	0.93				Data Not Normal at 5% Significance Level		
67				Lilliefors Test Statistic	0.188				Lilliefors GOF Test		
68				5% Lilliefors Critical Value	0.154				Data Not Normal at 5% Significance Level		
69				Data Not Normal at 5% Significance Level							
70											
71				Background Statistics Assuming Normal Distribution							
72			95% UTL with	95% Coverage	0.0833				90% Percentile (z)		0.068
73				95% UPL (t)	0.0754				95% Percentile (z)		0.0741
74				95% USL	0.0932				99% Percentile (z)		0.0856
75											
76				Gamma GOF Test							
77				A-D Test Statistic	1.35				Anderson-Darling Gamma GOF Test		
78				5% A-D Critical Value	0.747				Data Not Gamma Distributed at 5% Significance Level		
79				K-S Test Statistic	0.174				Kolmogorov-Smirnov Gamma GOF Test		
80				5% K-S Critical Value	0.155				Data Not Gamma Distributed at 5% Significance Level		
81				Data Not Gamma Distributed at 5% Significance Level							
82											
83				Gamma Statistics							
84				k hat (MLE)	10.35				k star (bias corrected MLE)		9.399
85				Theta hat (MLE)	0.00448				Theta star (bias corrected MLE)		0.00494
86				nu hat (MLE)	662.3				nu star (bias corrected)		601.5
87				MLE Mean (bias corrected)	0.0464				MLE Sd (bias corrected)		0.0151
88											
89				Background Statistics Assuming Gamma Distribution							
90			95% Wilson Hilferty (WH) Approx. Gamma UPL		0.0743				90% Percentile		0.0665
91			95% Hawkins Wixley (HW) Approx. Gamma UPL		0.0742				95% Percentile		0.0738
92			95% WH Approx. Gamma UTL with	95% Coverage	0.084				99% Percentile		0.0886
93			95% HW Approx. Gamma UTL with	95% Coverage	0.0842						
94				95% WH USL	0.0974				95% HW USL		0.0982
95											
96				Lognormal GOF Test							
97				Shapiro Wilk Test Statistic	0.891				Shapiro Wilk Lognormal GOF Test		
98				5% Shapiro Wilk Critical Value	0.93				Data Not Lognormal at 5% Significance Level		
99				Lilliefors Test Statistic	0.16				Lilliefors Lognormal GOF Test		
100				5% Lilliefors Critical Value	0.154				Data Not Lognormal at 5% Significance Level		
101				Data Not Lognormal at 5% Significance Level							
102											
103				Background Statistics assuming Lognormal Distribution							
104			95% UTL with	95% Coverage	0.0852				90% Percentile (z)		0.0649
105				95% UPL (t)	0.0741				95% Percentile (z)		0.0724
106				95% USL	0.102				99% Percentile (z)		0.0888

107											
108	Nonparametric Distribution Free Background Statistics										
109	Data do not follow a Discernible Distribution (0.05)										
110											
111	Nonparametric Upper Limits for Background Threshold Values										
112					Order of Statistic, r	32			95% UTL with 95% Coverage	0.11	
113					Approx, f used to compute achieved CC	1.684			pproximate Actual Confidence Coefficient achieved by UTL	0.806	
114									Approximate Sample Size needed to achieve specified CC	59	
115					95% Percentile Bootstrap UTL with 95% Coverage	0.11			95% BCA Bootstrap UTL with 95% Coverage	0.11	
116					95% UPL	0.0885			90% Percentile	0.0685	
117					90% Chebyshev UPL	0.0978			95% Percentile	0.0748	
118					95% Chebyshev UPL	0.121			99% Percentile	0.0998	
119					95% USL	0.11					
120											
121	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
122	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
123	and consists of observations collected from clean unimpacted locations.										
124	The use of USL tends to provide a balance between false positives and false negatives provided the data										
125	represents a background data set and when many onsite observations need to be compared with the BTV.										
126											
127	Be										
128											
129	General Statistics										
130					Total Number of Observations	30			Number of Missing Observations	2	
131					Number of Distinct Observations	2					
132					Number of Detects	0			Number of Non-Detects	30	
133					Number of Distinct Detects	0			Number of Distinct Non-Detects	2	
134					Minimum Detect	N/A			Minimum Non-Detect	0.001	
135					Maximum Detect	N/A			Maximum Non-Detect	0.01	
136					Variance Detected	N/A			Percent Non-Detects	100%	
137					Mean Detected	N/A			SD Detected	N/A	
138					Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A	
139											
140	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
141	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
142	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
143											
144	The data set for variable Be was not processed!										
145											
146											
147	Cd										
148											
149	General Statistics										
150					Total Number of Observations	30			Number of Missing Observations	2	
151					Number of Distinct Observations	2					
152					Number of Detects	0			Number of Non-Detects	30	
153					Number of Distinct Detects	0			Number of Distinct Non-Detects	2	
154					Minimum Detect	N/A			Minimum Non-Detect	0.001	
155					Maximum Detect	N/A			Maximum Non-Detect	0.01	
156					Variance Detected	N/A			Percent Non-Detects	100%	
157					Mean Detected	N/A			SD Detected	N/A	
158					Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A	
159											

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cd was not processed!

Cr

General Statistics

Total Number of Observations	32	Number of Missing Observations	0
Number of Distinct Observations	4		
Number of Detects	1	Number of Non-Detects	31
Number of Distinct Detects	1	Number of Distinct Non-Detects	3
Minimum Detect	0.00245	Minimum Non-Detect	0.002
Maximum Detect	0.00245	Maximum Non-Detect	0.02
Variance Detected	N/A	Percent Non-Detects	96.88%
Mean Detected	0.00245	SD Detected	N/A
Mean of Detected Logged Data	-6.012	SD of Detected Logged Data	N/A

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

s suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BT

The data set for variable Cr was not processed!

Co

General Statistics

Total Number of Observations	28	Number of Missing Observations	4
Number of Distinct Observations	5		
Number of Detects	3	Number of Non-Detects	25
Number of Distinct Detects	3	Number of Distinct Non-Detects	2
Minimum Detect	0.0012	Minimum Non-Detect	0.001
Maximum Detect	0.0028	Maximum Non-Detect	0.01
Variance Detected	7.2333E-7	Percent Non-Detects	89.29%
Mean Detected	0.00183	SD Detected	8.5049E-4
Mean of Detected Logged Data	-6.369	SD of Detected Logged Data	0.439

Warning: Data set has only 3 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.246	d2max (for USL)	2.714

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.885	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.767	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.319	Lilliefors GOF Test
5% Lilliefors Critical Value	0.425	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

	A	B	C	D	E	F	G	H	I	J	K	L
213	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											
214					KM Mean	0.0011					KM SD	3.5570E-4
215					95% UTL95% Coverage	0.0019					95% KM UPL (t)	0.00171
216					90% KM Percentile (z)	0.00155					95% KM Percentile (z)	0.00168
217					99% KM Percentile (z)	0.00192					95% KM USL	0.00206
218												
219	DL/2 Substitution Background Statistics Assuming Normal Distribution											
220					Mean	9.6429E-4					SD	0.00124
221					95% UTL95% Coverage	0.00374					95% UPL (t)	0.00311
222					90% Percentile (z)	0.00255					95% Percentile (z)	0.003
223					99% Percentile (z)	0.00384					95% USL	0.00432
224	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons											
225												
226	Gamma GOF Tests on Detected Observations Only											
227	Not Enough Data to Perform GOF Test											
228												
229	Gamma Statistics on Detected Data Only											
230					k hat (MLE)	7.625					k star (bias corrected MLE)	N/A
231					Theta hat (MLE)	2.4042E-4					Theta star (bias corrected MLE)	N/A
232					nu hat (MLE)	45.75					nu star (bias corrected)	N/A
233					MLE Mean (bias corrected)	N/A						
234					MLE Sd (bias corrected)	N/A					95% Percentile of Chisquare (2kstar)	N/A
235												
236	Gamma ROS Statistics using Imputed Non-Detects											
237	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
238	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
239	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
240	This is especially true when the sample size is small.											
241	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
242					Minimum	0.0012					Mean	0.00913
243					Maximum	0.01					Median	0.01
244					SD	0.00258					CV	0.283
245					k hat (MLE)	5.296					k star (bias corrected MLE)	4.752
246					Theta hat (MLE)	0.00172					Theta star (bias corrected MLE)	0.00192
247					nu hat (MLE)	296.6					nu star (bias corrected)	266.1
248					MLE Mean (bias corrected)	0.00913					MLE Sd (bias corrected)	0.00419
249					95% Percentile of Chisquare (2kstar)	17.62					90% Percentile	0.0147
250					95% Percentile	0.0169					99% Percentile	0.0216
251	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
252	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
253						WH	HW				WH	HW
254				95% Approx. Gamma UTL with 95% Coverage		0.0204	0.0219	95% Approx. Gamma UPL			0.0171	0.018
255				95% Gamma USL		0.0238	0.026					
256												
257	Estimates of Gamma Parameters using KM Estimates											
258					Mean (KM)	0.0011					SD (KM)	3.5570E-4
259					Variance (KM)	1.2652E-7					SE of Mean (KM)	8.5437E-5
260					k hat (KM)	9.497					k star (KM)	8.503
261					nu hat (KM)	531.8					nu star (KM)	476.2
262					theta hat (KM)	1.1543E-4					theta star (KM)	1.2891E-4
263					80% gamma percentile (KM)	0.00139					90% gamma percentile (KM)	0.0016
264					95% gamma percentile (KM)	0.00178					99% gamma percentile (KM)	0.00215
265												

	A	B	C	D	E	F	G	H	I	J	K	L
266	The following statistics are computed using gamma distribution and KM estimates											
267	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
268					WH	HW					WH	HW
269	95% Approx. Gamma UTL with 95% Coverage				0.00177	0.00175	95% Approx. Gamma UPL				0.00159	0.00158
270	95% KM Gamma Percentile				0.00156	0.00155	95% Gamma USL				0.00194	0.00193
271												
272	Lognormal GOF Test on Detected Observations Only											
273	Shapiro Wilk Test Statistic				0.931		Shapiro Wilk GOF Test					
274	5% Shapiro Wilk Critical Value				0.767		Detected Data appear Lognormal at 5% Significance Level					
275	Lilliefors Test Statistic				0.286		Lilliefors GOF Test					
276	5% Lilliefors Critical Value				0.425		Detected Data appear Lognormal at 5% Significance Level					
277	Detected Data appear Lognormal at 5% Significance Level											
278												
279	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
280	Mean in Original Scale				3.4707E-4		Mean in Log Scale				-8.951	
281	SD in Original Scale				5.9599E-4		SD in Log Scale				1.458	
282	95% UTL95% Coverage				0.00342		95% BCA UTL95% Coverage				0.0028	
283	95% Bootstrap (%) UTL95% Coverage				0.0028		95% UPL (t)				0.00162	
284	90% Percentile (z)				8.3950E-4		95% Percentile (z)				0.00143	
285	99% Percentile (z)				0.00385		95% USL				0.00678	
286												
287	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
288	KM Mean of Logged Data				-6.846		95% KM UTL (Lognormal)95% Coverage				0.00171	
289	KM SD of Logged Data				0.211		95% KM UPL (Lognormal)				0.00153	
290	95% KM Percentile Lognormal (z)				0.00151		95% KM USL (Lognormal)				0.00189	
291												
292	Background DL/2 Statistics Assuming Lognormal Distribution											
293	Mean in Original Scale				9.6429E-4		Mean in Log Scale				-7.304	
294	SD in Original Scale				0.00124		SD in Log Scale				0.696	
295	95% UTL95% Coverage				0.00321		95% UPL (t)				0.00225	
296	90% Percentile (z)				0.00164		95% Percentile (z)				0.00211	
297	99% Percentile (z)				0.0034		95% USL				0.00445	
298	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
299												
300	Nonparametric Distribution Free Background Statistics											
301	Data appear to follow a Discernible Distribution at 5% Significance Level											
302												
303	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
304	Order of Statistic, r				28		95% UTL with95% Coverage				0.01	
305	Approx, f used to compute achieved CC				1.474		pproximate Actual Confidence Coefficient achieved by UTL				0.762	
306	Approximate Sample Size needed to achieve specified CC				59		95% UPL				0.01	
307	95% USL				0.01		95% KM Chebyshev UPL				0.00267	
308												
309	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
310	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
311	and consists of observations collected from clean unimpacted locations.											
312	The use of USL tends to provide a balance between false positives and false negatives provided the data											
313	represents a background data set and when many onsite observations need to be compared with the BTV.											
314												
315	Pb											
316												
317	General Statistics											
318	Total Number of Observations				30		Number of Missing Observations				2	

319			Number of Distinct Observations		2						
320			Number of Detects		0				Number of Non-Detects		30
321			Number of Distinct Detects		0				Number of Distinct Non-Detects		2
322			Minimum Detect		N/A				Minimum Non-Detect		0.001
323			Maximum Detect		N/A				Maximum Non-Detect		0.01
324			Variance Detected		N/A				Percent Non-Detects		100%
325			Mean Detected		N/A				SD Detected		N/A
326			Mean of Detected Logged Data		N/A				SD of Detected Logged Data		N/A
327											
328			Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
329			Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
330			The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
331											
332			The data set for variable Pb was not processed!								
333											
334											
335	Li										
336											
337			General Statistics								
338			Total Number of Observations		32				Number of Missing Observations		0
339			Number of Distinct Observations		28						
340			Number of Detects		30				Number of Non-Detects		2
341			Number of Distinct Detects		26				Number of Distinct Non-Detects		2
342			Minimum Detect		0.0529				Minimum Non-Detect		0.0555
343			Maximum Detect		0.0837				Maximum Non-Detect		0.0648
344			Variance Detected		6.2544E-5				Percent Non-Detects		6.25%
345			Mean Detected		0.0699				SD Detected		0.00791
346			Mean of Detected Logged Data		-2.667				SD of Detected Logged Data		0.116
347											
348			Critical Values for Background Threshold Values (BTVs)								
349			Tolerance Factor K (For UTL)		2.186				d2max (for USL)		2.773
350											
351			Normal GOF Test on Detects Only								
352			Shapiro Wilk Test Statistic		0.972				Shapiro Wilk GOF Test		
353			5% Shapiro Wilk Critical Value		0.927				Detected Data appear Normal at 5% Significance Level		
354			Lilliefors Test Statistic		0.089				Lilliefors GOF Test		
355			5% Lilliefors Critical Value		0.159				Detected Data appear Normal at 5% Significance Level		
356			Detected Data appear Normal at 5% Significance Level								
357											
358			Kaplan Meier (KM) Background Statistics Assuming Normal Distribution								
359			KM Mean		0.069				KM SD		0.00832
360			95% UTL95% Coverage		0.0872				95% KM UPL (t)		0.0833
361			90% KM Percentile (z)		0.0797				95% KM Percentile (z)		0.0827
362			99% KM Percentile (z)		0.0884				95% KM USL		0.0921
363											
364			DL/2 Substitution Background Statistics Assuming Normal Distribution								
365			Mean		0.0674				SD		0.0124
366			95% UTL95% Coverage		0.0946				95% UPL (t)		0.0888
367			90% Percentile (z)		0.0833				95% Percentile (z)		0.0878
368			99% Percentile (z)		0.0963				95% USL		0.102
369			DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons								
370											
371			Gamma GOF Tests on Detected Observations Only								

	A	B	C	D	E	F	G	H	I	J	K	L
372					A-D Test Statistic	0.342	Anderson-Darling GOF Test					
373					5% A-D Critical Value	0.745	Detected data appear Gamma Distributed at 5% Significance Level					
374					K-S Test Statistic	0.104	Kolmogorov-Smirnov GOF					
375					5% K-S Critical Value	0.16	Detected data appear Gamma Distributed at 5% Significance Level					
376	Detected data appear Gamma Distributed at 5% Significance Level											
377												
378	Gamma Statistics on Detected Data Only											
379					k hat (MLE)	78.12			k star (bias corrected MLE)	70.33		
380					Theta hat (MLE)	8.9455E-4			Theta star (bias corrected MLE)	9.9363E-4		
381					nu hat (MLE)	4687			nu star (bias corrected)	4220		
382					MLE Mean (bias corrected)	0.0699						
383					MLE Sd (bias corrected)	0.00833			95% Percentile of Chisquare (2kstar)	169.3		
384												
385	Gamma ROS Statistics using Imputed Non-Detects											
386	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
387	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
388	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
389	This is especially true when the sample size is small.											
390	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
391					Minimum	0.0529			Mean	0.0691		
392					Maximum	0.0837			Median	0.0697		
393					SD	0.0083			CV	0.12		
394					k hat (MLE)	69.43			k star (bias corrected MLE)	62.94		
395					Theta hat (MLE)	9.9502E-4			Theta star (bias corrected MLE)	0.0011		
396					nu hat (MLE)	4444			nu star (bias corrected)	4028		
397					MLE Mean (bias corrected)	0.0691			MLE Sd (bias corrected)	0.00871		
398					95% Percentile of Chisquare (2kstar)	153.1			90% Percentile	0.0805		
399					95% Percentile	0.084			99% Percentile	0.0909		
400	The following statistics are computed using Gamma ROS Statistics on Imputed Data											
401	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
402						WH	HW				WH	HW
403					95% Approx. Gamma UTL with 95% Coverage	0.0888	0.089		95% Approx. Gamma UPL		0.0843	0.0844
404					95% Gamma USL	0.0948	0.0952					
405												
406	Estimates of Gamma Parameters using KM Estimates											
407					Mean (KM)	0.069			SD (KM)	0.00832		
408					Variance (KM)	6.9254E-5			SE of Mean (KM)	0.0015		
409					k hat (KM)	68.75			k star (KM)	62.33		
410					nu hat (KM)	4400			nu star (KM)	3989		
411					theta hat (KM)	0.001			theta star (KM)	0.00111		
412					80% gamma percentile (KM)	0.0762			90% gamma percentile (KM)	0.0804		
413					95% gamma percentile (KM)	0.084			99% gamma percentile (KM)	0.0909		
414												
415	The following statistics are computed using gamma distribution and KM estimates											
416	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
417						WH	HW				WH	HW
418					95% Approx. Gamma UTL with 95% Coverage	0.0888	0.0891		95% Approx. Gamma UPL		0.0842	0.0844
419					95% KM Gamma Percentile	0.0835	0.0836		95% Gamma USL		0.0948	0.0953
420												
421	Lognormal GOF Test on Detected Observations Only											
422					Shapiro Wilk Test Statistic	0.961	Shapiro Wilk GOF Test					
423					5% Shapiro Wilk Critical Value	0.927	Detected Data appear Lognormal at 5% Significance Level					
424					Lilliefors Test Statistic	0.112	Lilliefors GOF Test					

425				5% Lilliefors Critical Value	0.159	Detected Data appear Lognormal at 5% Significance Level					
426	Detected Data appear Lognormal at 5% Significance Level										
427											
428	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects										
429				Mean in Original Scale	0.0691				Mean in Log Scale	-2.68	
430				SD in Original Scale	0.00829				SD in Log Scale	0.123	
431				95% UTL95% Coverage	0.0897				95% BCA UTL95% Coverage	0.0822	
432				95% Bootstrap (%) UTL95% Coverage	0.0837				95% UPL (t)	0.0848	
433				90% Percentile (z)	0.0803				95% Percentile (z)	0.084	
434				99% Percentile (z)	0.0913				95% USL	0.0965	
435											
436	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution										
437				KM Mean of Logged Data	-2.681				95% KM UTL (Lognormal)95% Coverage	0.0898	
438				KM SD of Logged Data	0.124				95% KM UPL (Lognormal)	0.0848	
439				95% KM Percentile Lognormal (z)	0.084				95% KM USL (Lognormal)	0.0966	
440											
441	Background DL/2 Statistics Assuming Lognormal Distribution										
442				Mean in Original Scale	0.0674				Mean in Log Scale	-2.72	
443				SD in Original Scale	0.0124				SD in Log Scale	0.236	
444				95% UTL95% Coverage	0.11				95% UPL (t)	0.0989	
445				90% Percentile (z)	0.0891				95% Percentile (z)	0.0971	
446				99% Percentile (z)	0.114				95% USL	0.127	
447	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.										
448											
449	Nonparametric Distribution Free Background Statistics										
450	Data appear to follow a Discernible Distribution at 5% Significance Level										
451											
452	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)										
453				Order of Statistic, r	32				95% UTL with95% Coverage	0.0837	
454				Approx, f used to compute achieved CC	1.684				pproximate Actual Confidence Coefficient achieved by UTL	0.806	
455				Approximate Sample Size needed to achieve specified CC	59				95% UPL	0.0819	
456				95% USL	0.0837				95% KM Chebyshev UPL	0.106	
457											
458	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.										
459	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers										
460	and consists of observations collected from clean unimpacted locations.										
461	The use of USL tends to provide a balance between false positives and false negatives provided the data										
462	represents a background data set and when many onsite observations need to be compared with the BTV.										
463											
464	Hg										
465											
466	General Statistics										
467				Total Number of Observations	30				Number of Missing Observations	2	
468				Number of Distinct Observations	1						
469				Number of Detects	0				Number of Non-Detects	30	
470				Number of Distinct Detects	0				Number of Distinct Non-Detects	1	
471				Minimum Detect	N/A				Minimum Non-Detect	2.0000E-4	
472				Maximum Detect	N/A				Maximum Non-Detect	2.0000E-4	
473				Variance Detected	N/A				Percent Non-Detects	100%	
474				Mean Detected	N/A				SD Detected	N/A	
475				Mean of Detected Logged Data	N/A				SD of Detected Logged Data	N/A	
476											
477	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										

478	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
479	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
480											
481	The data set for variable Hg was not processed!										
482											
483											
484	Mo										
485											
486	General Statistics										
487					Total Number of Observations	32			Number of Missing Observations	0	
488					Number of Distinct Observations	21					
489					Number of Detects	22			Number of Non-Detects	10	
490					Number of Distinct Detects	20			Number of Distinct Non-Detects	2	
491					Minimum Detect	0.00358			Minimum Non-Detect	0.01	
492					Maximum Detect	0.069			Maximum Non-Detect	0.02	
493					Variance Detected	2.1788E-4			Percent Non-Detects	31.25%	
494					Mean Detected	0.0151			SD Detected	0.0148	
495					Mean of Detected Logged Data	-4.495			SD of Detected Logged Data	0.745	
496											
497	Critical Values for Background Threshold Values (BTVs)										
498					Tolerance Factor K (For UTL)	2.186			d2max (for USL)	2.773	
499											
500	Normal GOF Test on Detects Only										
501					Shapiro Wilk Test Statistic	0.688			Shapiro Wilk GOF Test		
502					5% Shapiro Wilk Critical Value	0.911			Data Not Normal at 5% Significance Level		
503					Lilliefors Test Statistic	0.239			Lilliefors GOF Test		
504					5% Lilliefors Critical Value	0.184			Data Not Normal at 5% Significance Level		
505	Data Not Normal at 5% Significance Level										
506											
507	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution										
508					KM Mean	0.0126			KM SD	0.0126	
509					95% UTL95% Coverage	0.0401			95% KM UPL (t)	0.0343	
510					90% KM Percentile (z)	0.0287			95% KM Percentile (z)	0.0333	
511					99% KM Percentile (z)	0.0419			95% KM USL	0.0475	
512											
513	DL/2 Substitution Background Statistics Assuming Normal Distribution										
514					Mean	0.0122			SD	0.0129	
515					95% UTL95% Coverage	0.0405			95% UPL (t)	0.0345	
516					90% Percentile (z)	0.0288			95% Percentile (z)	0.0335	
517					99% Percentile (z)	0.0423			95% USL	0.0481	
518	DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons										
519											
520	Gamma GOF Tests on Detected Observations Only										
521					A-D Test Statistic	0.7			Anderson-Darling GOF Test		
522					5% A-D Critical Value	0.757			Detected data appear Gamma Distributed at 5% Significance Level		
523					K-S Test Statistic	0.163			Kolmogorov-Smirnov GOF		
524					5% K-S Critical Value	0.188			Detected data appear Gamma Distributed at 5% Significance Level		
525	Detected data appear Gamma Distributed at 5% Significance Level										
526											
527	Gamma Statistics on Detected Data Only										
528					k hat (MLE)	1.814			k star (bias corrected MLE)	1.597	
529					Theta hat (MLE)	0.0083			Theta star (bias corrected MLE)	0.00943	
530					nu hat (MLE)	79.84			nu star (bias corrected)	70.28	

	A	B	C	D	E	F	G	H	I	J	K	L
531				MLE Mean (bias corrected)		0.0151						
532				MLE Sd (bias corrected)		0.0119				95% Percentile of Chisquare (2kstar)		8.15
533												
534					Gamma ROS Statistics using Imputed Non-Detects							
535					GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs							
536					GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)							
537					For such situations, GROS method may yield incorrect values of UCLs and BTVs							
538					This is especially true when the sample size is small.							
539					For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates							
540					Minimum	0.00358				Mean		0.0136
541					Maximum	0.069				Median		0.01
542					SD	0.0124				CV		0.907
543					k hat (MLE)	2.415				k star (bias corrected MLE)		2.21
544					Theta hat (MLE)	0.00564				Theta star (bias corrected MLE)		0.00617
545					nu hat (MLE)	154.6				nu star (bias corrected)		141.4
546					MLE Mean (bias corrected)	0.0136				MLE Sd (bias corrected)		0.00917
547					95% Percentile of Chisquare (2kstar)	10.16				90% Percentile		0.0259
548					95% Percentile	0.0313				99% Percentile		0.0433
549					The following statistics are computed using Gamma ROS Statistics on Imputed Data							
550					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
551						WH	HW				WH	HW
552					95% Approx. Gamma UTL with 95% Coverage	0.0391	0.0395			95% Approx. Gamma UPL	0.0314	0.0313
553					95% Gamma USL	0.0506	0.052					
554												
555					Estimates of Gamma Parameters using KM Estimates							
556					Mean (KM)	0.0126				SD (KM)		0.0126
557					Variance (KM)	1.5875E-4				SE of Mean (KM)		0.0023
558					k hat (KM)	0.998				k star (KM)		0.926
559					nu hat (KM)	63.9				nu star (KM)		59.24
560					theta hat (KM)	0.0126				theta star (KM)		0.0136
561					80% gamma percentile (KM)	0.0204				90% gamma percentile (KM)		0.0295
562					95% gamma percentile (KM)	0.0388				99% gamma percentile (KM)		0.0603
563												
564					The following statistics are computed using gamma distribution and KM estimates							
565					Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods							
566						WH	HW				WH	HW
567					95% Approx. Gamma UTL with 95% Coverage	0.0388	0.0392			95% Approx. Gamma UPL	0.0306	0.0305
568					95% KM Gamma Percentile	0.0294	0.0292			95% Gamma USL	0.0511	0.0528
569												
570					Lognormal GOF Test on Detected Observations Only							
571					Shapiro Wilk Test Statistic	0.962				Shapiro Wilk GOF Test		
572					5% Shapiro Wilk Critical Value	0.911				Detected Data appear Lognormal at 5% Significance Level		
573					Lilliefors Test Statistic	0.122				Lilliefors GOF Test		
574					5% Lilliefors Critical Value	0.184				Detected Data appear Lognormal at 5% Significance Level		
575					Detected Data appear Lognormal at 5% Significance Level							
576												
577					Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects							
578					Mean in Original Scale	0.0127				Mean in Log Scale		-4.647
579					SD in Original Scale	0.0128				SD in Log Scale		0.691
580					95% UTL95% Coverage	0.0434				95% BCA UTL95% Coverage		0.069
581					95% Bootstrap (%) UTL95% Coverage	0.069				95% UPL (t)		0.0315
582					90% Percentile (z)	0.0232				95% Percentile (z)		0.0299
583					99% Percentile (z)	0.0479				95% USL		0.0652

	A	B	C	D	E	F	G	H	I	J	K	L
584												
585	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
586					KM Mean of Logged Data	-4.655			95% KM UTL (Lognormal)95% Coverage			0.0419
587					KM SD of Logged Data	0.678			95% KM UPL (Lognormal)			0.0306
588					95% KM Percentile Lognormal (z)	0.029			95% KM USL (Lognormal)			0.0624
589												
590	Background DL/2 Statistics Assuming Lognormal Distribution											
591					Mean in Original Scale	0.0122			Mean in Log Scale			-4.703
592					SD in Original Scale	0.0129			SD in Log Scale			0.706
593					95% UTL95% Coverage	0.0424			95% UPL (t)			0.0306
594					90% Percentile (z)	0.0224			95% Percentile (z)			0.029
595					99% Percentile (z)	0.0469			95% USL			0.0643
596	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
597												
598	Nonparametric Distribution Free Background Statistics											
599	Data appear to follow a Discernible Distribution at 5% Significance Level											
600												
601	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
602					Order of Statistic, r	32			95% UTL with95% Coverage			0.069
603					Approx, f used to compute achieved CC	1.684			pproximate Actual Confidence Coefficient achieved by UTL			0.806
604					Approximate Sample Size needed to achieve specified CC	59			95% UPL			0.0495
605					95% USL	0.069			95% KM Chebyshev UPL			0.0684
606												
607	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
608	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
609	and consists of observations collected from clean unimpacted locations.											
610	The use of USL tends to provide a balance between false positives and false negatives provided the data											
611	represents a background data set and when many onsite observations need to be compared with the BTV.											
612												
613	Ra											
614												
615	General Statistics											
616					Total Number of Observations	32			Number of Missing Observations			0
617					Number of Distinct Observations	32						
618					Number of Detects	23			Number of Non-Detects			9
619					Number of Distinct Detects	23			Number of Distinct Non-Detects			9
620					Minimum Detect	0.375			Minimum Non-Detect			0.373
621					Maximum Detect	1.76			Maximum Non-Detect			0.915
622					Variance Detected	0.0792			Percent Non-Detects			28.13%
623					Mean Detected	0.769			SD Detected			0.281
624					Mean of Detected Logged Data	-0.316			SD of Detected Logged Data			0.323
625												
626	Critical Values for Background Threshold Values (BTVs)											
627					Tolerance Factor K (For UTL)	2.186			d2max (for USL)			2.773
628												
629	Normal GOF Test on Detects Only											
630					Shapiro Wilk Test Statistic	0.817			Shapiro Wilk GOF Test			
631					5% Shapiro Wilk Critical Value	0.914			Data Not Normal at 5% Significance Level			
632					Lilliefors Test Statistic	0.206			Lilliefors GOF Test			
633					5% Lilliefors Critical Value	0.18			Data Not Normal at 5% Significance Level			
634	Data Not Normal at 5% Significance Level											
635												
636	Kaplan Meier (KM) Background Statistics Assuming Normal Distribution											

	A	B	C	D	E	F	G	H	I	J	K	L
637				KM Mean		0.678				KM SD		0.282
638				95% UTL95% Coverage		1.295				95% KM UPL (t)		1.164
639				90% KM Percentile (z)		1.04				95% KM Percentile (z)		1.142
640				99% KM Percentile (z)		1.335				95% KM USL		1.461
641												
642				DL/2 Substitution Background Statistics Assuming Normal Distribution								
643				Mean		0.634				SD		0.327
644				95% UTL95% Coverage		1.348				95% UPL (t)		1.196
645				90% Percentile (z)		1.052				95% Percentile (z)		1.171
646				99% Percentile (z)		1.394				95% USL		1.54
647				DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons								
648												
649				Gamma GOF Tests on Detected Observations Only								
650				A-D Test Statistic		0.674		Anderson-Darling GOF Test				
651				5% A-D Critical Value		0.744		Detected data appear Gamma Distributed at 5% Significance Level				
652				K-S Test Statistic		0.157		Kolmogorov-Smirnov GOF				
653				5% K-S Critical Value		0.182		Detected data appear Gamma Distributed at 5% Significance Level				
654				Detected data appear Gamma Distributed at 5% Significance Level								
655												
656				Gamma Statistics on Detected Data Only								
657				k hat (MLE)		9.648				k star (bias corrected MLE)		8.418
658				Theta hat (MLE)		0.0797				Theta star (bias corrected MLE)		0.0913
659				nu hat (MLE)		443.8				nu star (bias corrected)		387.3
660				MLE Mean (bias corrected)		0.769						
661				MLE Sd (bias corrected)		0.265				95% Percentile of Chisquare (2kstar)		27.38
662												
663				Gamma ROS Statistics using Imputed Non-Detects								
664				GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs								
665				GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)								
666				For such situations, GROS method may yield incorrect values of UCLs and BTVs								
667				This is especially true when the sample size is small.								
668				For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates								
669				Minimum		0.224				Mean		0.663
670				Maximum		1.76				Median		0.681
671				SD		0.299				CV		0.452
672				k hat (MLE)		5.676				k star (bias corrected MLE)		5.165
673				Theta hat (MLE)		0.117				Theta star (bias corrected MLE)		0.128
674				nu hat (MLE)		363.3				nu star (bias corrected)		330.5
675				MLE Mean (bias corrected)		0.663				MLE Sd (bias corrected)		0.292
676				95% Percentile of Chisquare (2kstar)		18.76				90% Percentile		1.053
677				95% Percentile		1.203				99% Percentile		1.521
678				The following statistics are computed using Gamma ROS Statistics on Imputed Data								
679				Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods								
680					WH	HW					WH	HW
681				95% Approx. Gamma UTL with 95% Coverage	1.424	1.452				95% Approx. Gamma UPL	1.217	1.229
682				95% Gamma USL	1.719	1.775						
683												
684				Estimates of Gamma Parameters using KM Estimates								
685				Mean (KM)		0.678				SD (KM)		0.282
686				Variance (KM)		0.0798				SE of Mean (KM)		0.0519
687				k hat (KM)		5.759				k star (KM)		5.24
688				nu hat (KM)		368.6				nu star (KM)		335.3
689				theta hat (KM)		0.118				theta star (KM)		0.129

690				80% gamma percentile (KM)	0.906			90% gamma percentile (KM)			1.074	
691				95% gamma percentile (KM)	1.227			99% gamma percentile (KM)			1.548	
692												
693	The following statistics are computed using gamma distribution and KM estimates											
694	Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods											
695					WH	HW				WH	HW	
696	95% Approx. Gamma UTL with 95% Coverage				1.357	1.372	95% Approx. Gamma UPL			1.176	1.181	
697	95% KM Gamma Percentile				1.147	1.152	95% Gamma USL			1.611	1.646	
698												
699	Lognormal GOF Test on Detected Observations Only											
700	Shapiro Wilk Test Statistic				0.947		Shapiro Wilk GOF Test					
701	5% Shapiro Wilk Critical Value				0.914		Detected Data appear Lognormal at 5% Significance Level					
702	Lilliefors Test Statistic				0.137		Lilliefors GOF Test					
703	5% Lilliefors Critical Value				0.18		Detected Data appear Lognormal at 5% Significance Level					
704	Detected Data appear Lognormal at 5% Significance Level											
705												
706	Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects											
707	Mean in Original Scale				0.677		Mean in Log Scale				-0.46	
708	SD in Original Scale				0.283		SD in Log Scale				0.372	
709	95% UTL95% Coverage				1.424		95% BCA UTL95% Coverage				1.76	
710	95% Bootstrap (%) UTL95% Coverage				1.76		95% UPL (t)				1.198	
711	90% Percentile (z)				1.017		95% Percentile (z)				1.164	
712	99% Percentile (z)				1.501		95% USL				1.772	
713												
714	Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution											
715	KM Mean of Logged Data				-0.463		95% KM UTL (Lognormal)95% Coverage				1.436	
716	KM SD of Logged Data				0.377		95% KM UPL (Lognormal)				1.205	
717	95% KM Percentile Lognormal (z)				1.171		95% KM USL (Lognormal)				1.792	
718												
719	Background DL/2 Statistics Assuming Lognormal Distribution											
720	Mean in Original Scale				0.634		Mean in Log Scale				-0.589	
721	SD in Original Scale				0.327		SD in Log Scale				0.545	
722	95% UTL95% Coverage				1.825		95% UPL (t)				1.417	
723	90% Percentile (z)				1.115		95% Percentile (z)				1.359	
724	99% Percentile (z)				1.97		95% USL				2.512	
725	DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.											
726												
727	Nonparametric Distribution Free Background Statistics											
728	Data appear to follow a Discernible Distribution at 5% Significance Level											
729												
730	Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)											
731	Order of Statistic, r				32		95% UTL with95% Coverage				1.76	
732	Approx, f used to compute achieved CC				1.684		pproximate Actual Confidence Coefficient achieved by UTL				0.806	
733	Approximate Sample Size needed to achieve specified CC				59		95% UPL				1.396	
734	95% USL				1.76		95% KM Chebyshev UPL				1.928	
735												
736	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
737	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
738	and consists of observations collected from clean unimpacted locations.											
739	The use of USL tends to provide a balance between false positives and false negatives provided the data											
740	represents a background data set and when many onsite observations need to be compared with the BTV.											
741												
742	Se											

743											
744	General Statistics										
745				Total Number of Observations	32			Number of Missing Observations	0		
746				Number of Distinct Observations	2						
747				Number of Detects	0			Number of Non-Detects	32		
748				Number of Distinct Detects	0			Number of Distinct Non-Detects	2		
749				Minimum Detect	N/A			Minimum Non-Detect	0.005		
750				Maximum Detect	N/A			Maximum Non-Detect	0.05		
751				Variance Detected	N/A			Percent Non-Detects	100%		
752				Mean Detected	N/A			SD Detected	N/A		
753				Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A		
754											
755	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
756	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
757	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
758											
759	The data set for variable Se was not processed!										
760											
761											
762	Th										
763											
764	General Statistics										
765				Total Number of Observations	30			Number of Missing Observations	2		
766				Number of Distinct Observations	2						
767				Number of Detects	0			Number of Non-Detects	30		
768				Number of Distinct Detects	0			Number of Distinct Non-Detects	2		
769				Minimum Detect	N/A			Minimum Non-Detect	0.001		
770				Maximum Detect	N/A			Maximum Non-Detect	0.01		
771				Variance Detected	N/A			Percent Non-Detects	100%		
772				Mean Detected	N/A			SD Detected	N/A		
773				Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A		
774											
775	Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!										
776	Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!										
777	The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).										
778											
779	The data set for variable Th was not processed!										
780											
781											