2018 CCR Annual Groundwater Monitoring and Corrective Action Report

Bremo Power Station
North Ash Pond

Prepared for:

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EXECUTIVE SUMMARY

This *2018 CCR Annual Groundwater Monitoring and Corrective Action Report* (Report) was prepared on behalf of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy) for the North Ash Pond (Unit) at the Bremo Power Station (Station). The Station is located in Fluvanna County at 1038 Bremo Road, east of State Route 15 (James Madison Highway) and north of the James River. Historically, the Station operated the Unit as one of the three surface impoundments at the Station for the management of Coal Combustion Residuals (CCR) generated by the Station. The Unit is considered an existing CCR surface impoundment under Title 40 Code of Federal Regulations (CCR) Part 257.50 *et seq.* [*Disposal of Coal Combustion Residuals* (CCR) *from Electric Utilities* (Final Rule; Federal Register Vol. 80, No. 74, 21302-21501 on April 17, 2015, Federal Register Vol. 81, No. 151, 51802-51808 on August 5, 2016, as amended per Federal Register Vol. 83 No. 146 36435-36456 on July 30, 2018)] as well as the Commonwealth of Virginia adoption of 40 CFR Part 257 Subpart D by reference [Title 9 Virginia Administrative Code (VAC) Agency 20, Chapter 81-800 *et seq.* (9VAC20-81-800)]. Pursuant to the CCR Rule, the Station operator is required to complete an *Annual Groundwater Monitoring and Corrective Action Report* (Report) for the Unit by January 31st annually.

The Report documents the status of the CCR Rule groundwater monitoring program for the Unit, summarizes key actions completed, describes issues encountered, actions to resolve identified concerns, and key activities for the upcoming year. More specifically, this Report describes the initiation, performance, results of the CCR Rule Assessment Monitoring Program (AMP), activities performed to comply with CCR Rule requirements, and the progression of future sampling activities pursuant to the CCR Rule and the Unit's *Groundwater Monitoring Plan* (GMP). Consistent with the CCR Rule, identifying statistically significant increases over facility background concentrations for Detection Monitoring Program (DMP) parameters on December 13, 2017, Dominion Energy established an AMP in January 2018. Subsequent to the initial AMP in January 2018 and the first semi-annual event in April and May 2018, Dominion Energy established Groundwater Protection Standards (GWPS) for the Unit in September 2018. Based on the evaluation of the 2018 groundwater monitoring program data there was a confirmed federal GWPS exceedance in 2018, for lithium at MW-27D during the first semi-annual sampling event. Additionally, based on the evaluation of the first semi-annual 2018 groundwater monitoring program data there were confirmed Virginia CCR Rule GWPS exceedances for lithium at MW-27D and at MW-35. Results from the second semi-annual 2018 event, received November 26, 2018, are being evaluated consistent with the CCR Rule timeframes.

Based on the results of the 2018 data evaluations, Dominion Energy intends to implement monitoring activities in 2019 that are consistent with the provisions in the CCR Rule [Part 257.95] and the Unit's GMP.

Table of Contents

Table of Contents - Continued

List of Tables

List of Drawings

List of Appendices

Table of Contents - Continued

1.0 INTRODUCTION

This *2018 CCR Annual Groundwater Monitoring and Corrective Action Report* (Report) was prepared on behalf of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy) for the North Ash Pond (Unit) at the Bremo Power Station (Station) located in Fluvanna County, Virginia. The North Ash Pond is an existing CCR Unit and is subject to the groundwater monitoring requirements in the Title 40 Code of Federal Regulations (CFR) Part 257.50 *et seq*. [Disposal of Coal Combustion Residuals from Electric Utilities (CCR Rule; Federal Register Vol. 80, No. 74, 31302-21501 on April 17, 2015, and Federal Register Vol. 81, No. 151 51802-51808 and August 5, 2016) as amended per Federal Register Vol. 83 No. 146 36435-36456 on July 30, 2018)] as well as the Commonwealth of Virginia adoption of 40 CFR Part 257 Subpart D by reference [Title 9 Virginia Administrative Code (VAC) Agency 20, Chapter 81-800 *et seq.* (9VAC20-81-800)]. Pursuant to the CCR Rule, no later than January 31st annually, the owner or operator of a CCR unit must prepare an annual groundwater monitoring and corrective action report for the CCR unit documenting the status of the groundwater monitoring and corrective action programs for the preceding year.

Golder Associates Inc. (Golder) has prepared this Report for the Unit on behalf of Dominion Energy in accordance with CCR Rule Part 257.90(e). This Report provides the monitoring data and required data evaluations for the Initial Assessment Monitoring Program (AMP) event performed in January 2018 and the first and second semi-annual AMP CCR monitoring compliance events performed in April-May and September 2018, respectively.

1.1 Site Location

The Bremo Power Station is owned and operated by Dominion Energy and is located in Fluvanna County at 1038 Bremo Road, Bremo Bluff, Virginia on the east side of State Route 15 (James Madison Highway) and north of the James River. A site location map is presented as Drawing 1.

1.2 Site History

The Station converted from a coal-fired power plant to a natural gas-fired power plant in 2014 and was placed in cold storage in 2018. CCR from past operations was stored in the North Ash Pond (Unit). No newly generated CCR has been placed in this Unit since the conversion to a gas-fired plant, but CCR from two inactive CCR surface impoundments at the Station is being consolidated in the Unit. At this time, the Unit is scheduled for closure in place with a final cover system. As an existing CCR surface impoundment, the Unit is subject to the groundwater monitoring requirements of the CCR Rule.

1.3 Key Actions

Key actions for the Unit to date are as follows:

- Initiated the collection of eight baseline/background samples on October 27, 2016, and completed the background monitoring activities on July 24, 2017, pursuant to the CCR Rule [257.94(b)];
- Conducted the initial DMP compliance sampling event on September 6, 2017, and completed the sample analyses on September 14, 2017 (date of laboratory analytical package), pursuant to the CCR Rule [257.94];
- Placed a copy of the Unit's *Groundwater Monitoring Plan* (GMP) documenting the design information for the monitoring wells pursuant to the CCR Rule [257.91(e)(1)] in the Unit's operating record on October 17, 2017, pursuant to the CCR Rule [257.105(h)(2)];
- Certified the Unit's groundwater monitoring system pursuant to the CCR Rule [257.91(e)(1) and posted the Certification in the Unit's operating record on October 17, 2017, pursuant to the CCR Rule [257.105(h)(3)];
- Certified the selection of a statistical method pursuant to the CCR Rule [257.93(f)(6)] and posted the Certification in the Unit's operating record on October 17, 2017, pursuant to the CCR Rule [257.105(h)(4)]; and
- Placed a notification of a Statistically Significant Increase (SSI) over Unit background concentrations under the DMP in the Unit's operating record on December 13, 2017.
- Conducted the initial AMP compliance sampling event on January 29-30, 2018, and completed the sample analyses on March 12, 2018 (revised March 20, 2018), pursuant to the CCR Rule [257.95(b)];
- Conducted the first semi-annual AMP compliance sampling event on April 30 through May 1, 2018, and completed the sample analyses on June 8, 2018, pursuant to the CCR Rule [257.95(d)(1)];
- Conducted the second semi-annual AMP compliance sampling event on October 15 through October 15, 2018, and completed the sample analyses on November 9, 2018 (revised January 30, 2019), pursuant to the CCR Rule [257.95(d)(1)];
- Established groundwater protection standards (GWPS) for detected constituents in Appendix IV of Part 257 on September 6, 2018 (revised September 17, 2018), pursuant to the CCR Rule [257.95(d)(2)];
- Notification of first semi-annual GWPS exceedance placed on the Unit's operating record on October 6, 2018 (revised November 2, 2018); and
- An Assessment of Corrective Measures (ACM) was initiated for the Unit within the required timeframe pursuant to 40 CFR Part 257.96.

1.4 Monitoring Program Concerns

There were no monitoring program concerns identified during compliance monitoring events conducted in 2018.

2.0 SITE INFORMATION

The Station property consists of wooded, open, and developed land just north of the James River. The Station's northern, eastern, and western boundaries are bordered by primarily undeveloped parcels, and the Station is bordered to the south by a CSX rail line and the James River.

Land use surrounding the Station is classified as "A-1 Agricultural," and consists of undeveloped wooded and agricultural properties within a rural residential setting.

As part of the Station operations, Dominion Energy operates the Unit for CCR storage. As an existing CCR impoundment, the Unit was subject to the groundwater monitoring provisions of the CCR Rule by October 17, 2017.

2.1 Monitoring Well Network

The Unit's GMP (Golder, 2017) details the design of the Unit's CCR Rule groundwater monitoring network. As presented in the GMP, the monitoring network is comprised of three (3) upgradient/background wells [MW-29D, MW-11, and MW-29S (formerly OW-29S)] and five (5) downgradient monitoring wells (MW-33, MW-34, MW-35, MW-24, and MW-27D) designed to monitor the uppermost aquifer beneath the Unit. The groundwater monitoring well locations relative to the Unit are shown on Drawing 2.

In addition, the Station maintains four (4) perimeter sentinel wells (MW-25S, MW-26S, MW-27S, and MW-28) and two observation wells (OW-25D and OW-26D) that are presently used for periodic water level monitoring activities.

2.1.1 Monitoring Well Installation and Decommissioning Activities

No groundwater monitoring wells associated with the Unit's compliance monitoring network were installed or decommissioned in calendar year 2018. Four contamination assessment wells (MW-22D, MW-23D, MW-36S, and MW-36D) were installed at the Station to assist with the ACM in December 2018.

2.2 Geology and Hydrogeology

A summary of the geology and hydrogeology for the Station is presented in the following sections.

2.2.1 Geology

The Station is in the central part of the Piedmont physiographic province on the Chopawamsic Terrane (Bailey and Owens, 2012; VDMR, 1993). The surrounding area is characterized by undulating terrain incised by a number of dendritically patterned, intermittent and perennial stream channels flowing in a generally southern direction towards the James River. The Piedmont physiographic province is characterized by igneous and metamorphic rock formations of Pre-Cambrian (Catoctin Formation) to Ordovician geologic age. The province consists of a mosaic of accreted terrain and has been folded and faulted near the end of Ordovician time.

Site observations and regional mapping indicate that portions of the Station near the James River are underlain by unconsolidated Quaternary-age alluvial sediments. Locally, a basal stratum is observed to overlie competent bedrock or saprolite, and is generally characterized as a gravel or cobble deposit of variable thickness. The gravel is in turn overlain by fine-grained sediments that appear to be associated with fluvial overbank deposits.

2.2.2 Hydrogeology

The uppermost aquifer beneath the Unit is unconfined and found in the surficially exposed overburden and bedrock. Locally, the groundwater flow direction in the uppermost aquifer is from the northeast to the southwest across the Station and the Unit towards the James River.

2.2.3 Potentiometric Surface Evaluation

Historical static water level data for the facility are summarized in Table 1. Consistent with the requirements of the CCR Rule, the rate and direction of groundwater flow within the uppermost aquifer beneath the Unit was determined after each sampling event. The Groundwater Potentiometric Surface Map presented as Drawing 2 was prepared using static water level data obtained during the initial AMP event on January 29, 2018. The Groundwater Potentiometric Surface Maps presented as Drawings 3 and 4 were prepared using static water level data obtained during the first and second semi-annual AMP events on April 30 - May 1 and October 15, 2018, respectively. The interpreted data indicates that the groundwater gradient direction remains consistent with previous monitoring events. Based on review and minimum regulatory requirements, Golder believes that the groundwater monitoring network continues to adequately monitor the uppermost aquifer in accordance with provisions of the CCR Rule.

Using the groundwater contours presented as an overlay on Drawings 2 through 4, the average groundwater flow for the uppermost aquifer in the study area was calculated for each monitoring event using the following equations as follows.

The average hydraulic gradient for the Unit along the ideal flow line beneath the Unit was calculated using the following equation:

$$i = {}^{h_L}/_{L}$$

Where: i = hydraulic gradient (unitless)
h_L = head loss (elevation difference in feet)
L = length (horizontal distance in feet)

The groundwater flow rate was calculated using the following formula:

$$V = {}^{ki}/_{\theta}$$

Where: V= Groundwater Velocity (cm/s)
k = hydraulic conductivity (cm/s)
i = hydraulic gradient (unitless)
θ = assumed porosity (unitless)

Using the estimated average effective porosity value of 20% saprolite and 2.5% for the bedrock (Fetter, 1988), the estimated average hydraulic conductivity values for the different matrices (Golder 2017), and the calculated gradients, the average rate of groundwater flow (*Vgw*) in the uppermost aquifer beneath the Unit was calculated and is summarized in the following table.

Aquifer Formation	Hydraulic Conductivity (k, cm/s)	Contour lines (feet amsl)	Flow Length (feet)	Average Gradient (i)	Assumed Porosity (Ø)	Estimated Groundwater Velocity	
						(cm/s)	(feet/year)
Initial Assessment Monitoring Program Event (January 2018)							
Saprolite	7.37E-05	325-250	1759	4.26E-02	0.20	1.57E-05	16.2
Bedrock	2.23E-04	325-250	1759	4.26E-02	0.025	3.80E-04	393
1st Semi-Annual Assessment Monitoring Program Event (April-May 2018)							
Saprolite	7.37E-05	325-250	1759	4.26E-02	0.20	1.57E-05	16.2
Bedrock	2.23E-04	325-250	1759	4.26E-02	0.025	3.80E-04	393
2nd Semi-Annual Assessment Monitoring Program Event (October 2018)							
Saprolite	7.37E-05	325-250	1759	4.26E-02	0.20	1.57E-05	16.2
Bedrock	2.23E-04	325-250	1759	4.26E-02	0.025	3.80E-04	393

Notes: cm/s = centimeter per second
amsl = above mean sea level

As presented, the estimated average groundwater flow rate in the uppermost aquifer beneath the Unit is approximately 16.2 feet per year for the saprolite and approximately 393 feet per year for the bedrock. The calculated flow rates for the events conducted in 2018 are consistent with previous flow rate calculations for the uppermost aquifer beneath the Unit. Previous calculations presented for the saprolite in the *2017 CCR Annual Groundwater Monitoring and Corrective Action Report* incorrectly used an effective porosity of 2.5%. Calculated flow rates for the saprolite for the events conducted in 2018 are consistent with previous saprolite flow rate calculations when the correct effective porosity of 20% is used.

3.0 FIELD ACTIVITIES

Groundwater sampling activities that occurred during 2018 are summarized in the following sections.

3.1 Compliance Monitoring Program Sampling Activities

Pursuant to the requirements in 40 CFR Part 257.95(b), an initial AMP sampling event was completed for the compliance groundwater monitoring network installed for the Unit for the constituents and parameters listed in Appendix IV of the CCR Rule. Pursuant to the requirements in 40 CFR 257.95(d)(1) two semi-annual AMP events were completed for the Unit for the constituents and parameters listed Appendix III of the CCR Rule and constituents and parameters listed in Appendix IV of the CCR Rule that were detected during the initial AMP sampling event. Summaries of the 2018 AMP sampling events are presented below.

Monitoring Event	Sample Dates	Initial Laboratory Package Receipt Date	Final Laboratory Package Receipt Date
Initial Assessment Monitoring Program Event	January 29-30, 2018	March 13, 2018	March 20, 2018
1st Semi-Annual Assessment Monitoring Program Event	April 30 – May 1, 2018	June 8, 2018	June 8, 2018
2nd Semi-Annual Assessment Monitoring Program Event	October 15-16, 2018	November 9, 2018	November 26, 2018

During each of the AMP sampling events, the compliance monitoring wells were sampled in accordance with the procedures presented in the Station's GMP (Golder, 2017). In general, the compliance monitoring wells were purged and sampled using micropurge sampling procedures and dedicated bladder pumps. Prior to purging, the depth to static water level in each well was measured with an electronic water level indicator, accurate to 0.01 foot. Using calibrated water quality meters, field parameter measurements were recorded at each well during the micropurge procedures, including pH, specific conductance, temperature, oxidation-reduction potential, and turbidity. After the water quality parameters stabilized, groundwater samples were collected in pre-preserved, laboratory supplied sample containers.

Samples collected during the initial AMP sampling event were submitted on ice in secured coolers under chain-of-custody control to Pace Analytical, LLC (Pace) in Mechanicsville, Virginia. The samples were then shipped to the Asheville, North Carolina (#460222); Minneapolis, Minnesota (#460163); and Greensburg, Pennsylvania (#460198) locations of Pace, which are each Virginia Environmental Laboratory Accreditation Program (VELAP)-accredited laboratories for CCR Rule Appendix III and IV constituents analyzed. Samples collected during the first semi-annual AMP event were submitted on ice in secured coolers under chain-of-custody control to Pace in Mechanicsville, Virginia. The samples were then shipped to the Asheville, North Carolina; Minneapolis, Minnesota; Grand Rapids, Michigan (#460153); and Greensburg, Pennsylvania locations of Pace for analysis. Samples collected during the second semi-annual AMP sampling event were submitted on ice in secured coolers under chain-of-custody control to Pace in Mechanicsville, Virginia. The samples were then shipped to the Asheville, North Carolina; Minneapolis, Minnesota; and Greensburg, Pennsylvania locations of Pace for analysis.

Verification sampling for molybdenum at MW-24 and lithium at MW-35 was completed on November 28, 2018, with sample analyses completed on December 12, 2018. Samples collected during the verification sampling event were submitted on ice in secured coolers under chain-of-custody control to Pace in Mechanicsville, Virginia. The samples were then shipped to the Asheville, North Carolina location of Pace for analysis.

4.0 LABORATORY ANALYTICAL RESULTS

Laboratory analytical results from the AMP sampling events conducted in 2018 are summarized in the following sections.

4.1 Initial Assessment Monitoring Program Event

The groundwater samples collected during the initial AMP event were analyzed by Pace for the presence of concentration of the constituents and parameters listed in Appendix IV of the CCR Rule. The laboratory certificates of analysis, chain-of-custody form, and field logs for the sampling event are presented in Appendix A. A summary of the CCR sampling data for the Unit is presented in Table 2.

4.2 1st Semi-Annual Assessment Monitoring Program Event

The groundwater samples collected during the first semi-annual AMP event were analyzed by Pace for the presence of concentrations of the constituent and parameters listed in Appendix III of the CCR rule and constituents and parameters of Appendix IV of the CCR rule that were detected during the initial AMP event. The laboratory certificates of analysis, chain-of-custody form, and field logs for the sampling event are presented in Appendix B. A summary of the CCR sampling data for the Unit is presented in Table 3.

4.3 2nd Semi-Annual Assessment Monitoring Program Event

The groundwater samples collected during the second semi-annual AMP event were analyzed by Pace for the presence of concentrations of the constituent and parameters listed in Appendix III of the CCR rule and constituents and parameters of Appendix IV of the CCR rule that were detected during the initial AMP event. The laboratory certificates of analysis, chain-of-custody form, and field logs for the sampling event are presented in Appendix C. A summary of the CCR sampling data for the Unit is presented in Table 4.

A verification sampling event occurred on November 28, 2018, for lithium in MW-35 and molybdenum in MW-24. These samples were analyzed by Pace for the presence of these constituents. The original results were refuted by the verification sampling, and are reported in the summary of the CCR sampling data in Table 4. The laboratory certificates of analysis, chain-of-custody form, and field logs for the sampling event are also presented in Appendix C.

5.0 DATA QUALITY VALIDATION

Golder performed a Quality Assurance (QA) review of the quality control (QC) data provided by the laboratories for the AMP events. Our QA review process is performed in general accordance with procedures outlined in the following EPA guidance documents:

- *National Functional Guidelines for Inorganic Superfund Methods Data Review*, January 2017 (EPA, 2017);
- *Sampling and Analysis Plan for US Department of Energy Office of Legacy Management Sites* (DOE, 2017)
- *Evaluation of radiochemical data usability, April 1997* (DOE, 1997)

The results of the data reviews are presented in Appendices A, B, and C and are summarized below.

5.1 Initial Compliance Event Findings

The laboratory and field QA/QC data for the initial AMP compliance monitoring event samples collected January 29-30, 2018, were reviewed in accordance with EPA Protocol. Field QA/QC samples for this event included an equipment blank that was collected at the Unit on January 29, 2018, and a field blank that was collected at the Unit on January 30, 2018, and a duplicate sample that was collected from compliance well MW-11 on January 29, 2018. These QA/QC samples were analyzed for the same constituents as the groundwater samples. Based on review of the laboratory-provided QC data and EPA guidance recommendations, the data for this sampling event were

determined to meet the data quality objectives for the project. It is noted that several reported sample results (lead) were qualified as estimated per EPA protocol due to similar analyte detections in one of more sample-group associated QC samples (equipment blank). A copy of the data validation record is presented in Appendix A.

5.2 1st Semi-Annual Compliance Event Findings

The laboratory and field QA/QC data for the first semi-annual AMP compliance monitoring event samples collected on April 30 and May 1, 2018, were reviewed in accordance with EPA Protocol. Field QA/QC samples for this event included a field blank that was collected at the Unit on April 30, 2018, an equipment blank that was collected at the Unit on May 1, 2018, and a duplicate sample that was collected from compliance well MW-11 on April 30, 2018. These QA/QC samples were analyzed for the same constituents as the groundwater samples. Based on review of the laboratory-provided QC data and EPA guidance recommendations, the data for this sampling event were determined to meet the data quality objectives for the project. A copy of the data validation record is presented in Appendix B.

5.3 2nd Semi-Annual Compliance Event Findings

The laboratory and field QA/QC data for the second semi-annual AMP compliance monitoring event samples collected on October 15-16, 2018, were reviewed in accordance with EPA Protocol. Field QA/QC samples for this event included a field blank and an equipment blank that were collected at the Unit on October 16, 2018, and a duplicate sample that was collected from compliance well MW-11 on October 15, 2018. These QA/QC samples were analyzed for the same constituents as the groundwater samples. Based on review of the laboratory-provided QC data and EPA guidance recommendations, the data for this sampling event were determined to meet the data quality objectives for the project. A copy of the data validation record is presented in Appendix C.

6.0 STATISTICAL EVALUATION OF GROUNDWATER DATA

Statistical evaluations completed in 2018 are summarized in the following sections.

6.1 Groundwater Protection Standards

Consistent with the provisions of 40 CFR Subpart 257.95(d)(2) for the CCR Rule, GWPS for the Appendix IV constituents listed in 40 CFR 257 which were detected during the initial AMP Appendix IV sampling event on January 29-30, 2018, were established on September 6, 2018 (revised September 17, 2018). Because the Commonwealth of Virginia adopted by reference the October 4, 2016 version of 40 CFR Part 257 into 9VAC20-81-800 of the Virginia Solid Waste Management Regulations, amendments to 40 CFR Part 257 Subpart D after October 4, 2016, have not been incorporated into 9VAC20-81-800 and health-based GWPS are not

applicable to the Virginia CCR Rule under 9VAC20-81-800. Therefore, two sets of GWPS were established (Federal CCR Rule GWPS and Virginia CCR GWPS) as follows.

1. For constituents for which a Maximum Contaminant Level (MCL) has been established, the MCL was used.
2. For constituents for which a health-based GWPS has been adopted under the August 29, 2018 Phase 1, Part 1 amendment to the CCR Rule, the health-based GWPS was used for the Federal CCR Rule GWPS.
3. Under 9VAC20-81-800, for constituents for which an MCL has not been established, the background concentration for the constituent was used for GWPS. Note that Virginia CCR site-specific background values were calculated using existing groundwater data collected for the Solid Waste Permit from February 2016 through August 2017 along with CCR background data collected during the same period.
4. For constituents for which the background level is higher than the MCL or health-based GWPS, the background concentration was used for GWPS.

The GWPS establishment documentation was placed in the Unit's operating record on September 6, 2018 (revised September 17, 2018).

6.2 Assessment Monitoring Program Data Evaluation

Per 40 CFR Part 257.94(e)(1), the Unit advanced into the AMP in January 2018. Based on a comparison of the first semi-annual AMP compliance groundwater monitoring data to the Unit's Federal GWPS, established September 6, 2018, other than lithium as discussed below, the were no Federal GWPS exceedances identified in 2018.

6.2.1 1st Semi-Annual Assessment Monitoring Program Data Evaluations

Pursuant to 40 CFR Subpart 257.95(e,f,g), using statistical methods certified by a professional engineer as presented in the October 17, 2017, Statistical Method Certification, the results from the Unit's monitoring wells were compared to established background concentrations and SSIs were identified over the Unit's background for the first semi-annual AMP sampling event. Concentrations above background are identified in Table 3.

The following GWPS exceedances were identified for the first semi-annual AMP sampling event. A record of the exceedance was placed in the Unit's operating record on October 6, 2018 (revised November 2, 2018).

CCR Rule Groundwater Protection Standard Exceedances

Detected Appendix IV Constituent	Unit	GWPS (µg/L)	Downgradient Monitoring Well(s)	Concentration (µg/L)
Lithium	North Pond	40	MW-27D	57.6

Note: µg/L = Micrograms per liter

Under 9VAC20-81-800, the following constituents were detected in one or more downgradient wells at a concentration above the Virginia CCR Rule GWPS.

Virginia CCR Rule Groundwater Protection Standard Exceedances

Detected Appendix IV Constituent	Unit	GWPS (µg/L)	Downgradient Monitoring Well(s)	Concentration (µg/L)
Lithium	North Pond	25	MW-27D	57.6
			MW-35	33.1

Note: µg/L = Micrograms per liter

A notice of these exceedances was placed in the Unit's operating record on October 6, 2018, (revised November 2, 2018).

6.2.2 2nd Semi-Annual Assessment Monitoring Program Data Evaluations

The data for the second semi-annual AMP sampling event and verification sampling event are being evaluated against the GWPS for the Unit and the Unit's background concentrations in accordance with the CCR Rule timeframes. The results from those evaluations will be presented in the 2019 Annual Groundwater Monitoring and Corrective Action Report.

7.0 CONCLUSIONS

7.1 Findings

Consistent with the CCR Rule, after identifying SSIs over Unit background concentrations for DMP parameters on January 2, 2018, Dominion Energy established an AMP in January 2018. Initial AMP sampling activities for the Unit's CCR groundwater monitoring network were completed in accordance with the CCR Rule on January-29-30, 2018, with sample analyses completed on March 20, 2018. The first semi-annual AMP compliance sampling event was completed on April 30 through May 1, 2018, with sample analyses completed on June 8, 2018. The second semi-annual AMP compliance sampling event was completed on October 15-16, 2018, with sample analyses completed on November 26, 2018. Verification sampling for molybdenum at MW-24 and lithium at MW-35 was completed on November 28, 2018, with sample analyses completed on December 12, 2018. These groundwater sampling and analysis activities were conducted in general accordance with the requirements of the Unit's GMP for the CCR network. Dominion established GWPS for the Unit on September 6, 2018. Comparison of the laboratory analytical results from the first 2018 semi-annual sampling event to established GWPS identified one Federal GWPS exceedance for lithium at MW-27D and two Virginia CCR Rule GWPS exceedances for lithium at MW-27D and MW-35. Monitoring results from the second semi-annual 2018 event conducted in October 2018 were received on November 26, 2018. These results are being evaluated against site-specific GWPS in accordance with the applicable CCR Rule timeframe.

7.2 Planned Activities

Dominion Energy intends to complete the initiated ACM and the required data evaluations for the second semi-annual AMP sampling event within the CCR Rule prescribed timeframe. Dominion Energy intends to continue semi-annual groundwater monitoring activities in 2019 that are consistent with the provisions in the CCR Rule [part 257.95] and the Unit's GMP.

8.0 REFERENCES

Bailey, C.M. and B.E. Owens. 2012. Traversing suspect terranes in the central Virginia Piedmont: From Proterozoic anorthosites to modern earthquakes, *in* Eppes, M.C., and Bartholomew, M.J., eds. *From the Blue Ridge to the Coastal Plain: Field Excursions in the Southeastern United States: Geological Society of America Field Guide No. 29*. pp 327-344.

DOE (Department of Energy). 2017. *Sampling and Analysis Plan for US Department of Energy Office of Legacy Management Sites*. https://energy.gov/lm/downloads/sampling-and-analysis-plan-us-department-energy-office-legacy-management-sites.

EPA (United States Environmental Protection Agency). 2009. *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance*. Office of Resource Conservation and Recovery – Program Implementation and Information Division. March.

EPA. 2015. Federal Register. Volume 80. No. 74. Friday April 17, 2015. Part II. Environmental Protection Agency. *40 CFR Parts 257and 261. Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule.* [EPA-HQ-RCRA–2009–0640; FRL–9919–44–OSWER]. RIN–2050–AE81. April.

EPA. 2017. *National Functional Guidelines for Inorganic Superfund Methods Data Review*. January.

G. Paar, J & Porterfield, Donivan. 1997. *Evaluation of radiochemical data usability*. DOE (Department of Energy) 10.2172/461261. April.

Fetter, C.W. 1988. *Applied Hydrology*. Merrill Publishing Company. 592 pp.

Golder Associates Inc. (Golder). 2017. Groundwater Monitoring Plan, Bremo Power Station, Fluvanna County, Virginia. October.

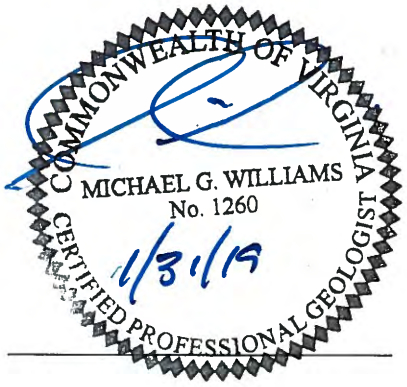
VDMR. 1993. *Geologic Map of Virginia*. Virginia Division of Mineral Resources, scale 1:500,000.

Virginia Waste Management Board (VWMB). 2016. Virginia Solid Waste Management Regulations – (9VAC20-81 *et seq*.). January.

9.0 SIGNATURE PAGE

This *2018 CCR Annual Groundwater Monitoring and Corrective Action Report* (Report) has been prepared by a qualified groundwater scientist on behalf of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy) for the Bremo Power Station North Ash Pond. This Report satisfies the reporting requirements specified in Title 40 Code of Federal Regulations (CFR) Part 257.90(e) *et seq.* [*Disposal of Coal Combustion Residuals* (CCR) *from Electric Utilities* (CCR Rule; Federal Register Vol. 80, No. 74, 21302-21501 on April 17, 2015, and Federal Register Vol. 81, No. 151, 51802-51808 on August 5, 2016), as amended per Federal Register Vol. 83 No. 146 36435-36456 on July 30, 2018)].

Signature



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https://golderassociates.sharepoint.com/sites/22463g/reports/bremo 2018/2018-10-15 bremo ccr annual report/2019-01-31 bremo north pond ccr agwmr.docx

TABLES

Table 1
Summary of Historical CCR Static Water Level Data
Bremo Power Station

Well Identification	Top of Casing Elevation (feet AMSL)	Measurement Date	Depth to Water (feet below top of casing)	Groundwater Elevation (feet AMSL)
MW-11	330.52	10/27/2016	26.54	303.98
		12/7/2016	27.30	303.22
		1/18/2017	27.65	302.87
		2/28/2017	27.78	302.74
		4/10/2017	27.73	302.79
		5/11/2017	27.36	303.16
		6/19/2017	27.20	303.32
		7/25/2017	28.01	302.51
		9/6/2017	29.04	301.48
		1/29/2018	30.77	299.75
		4/30/2018	30.01	300.51
		10/15/2018	28.06	302.46
MW-26S	394.82	10/27/2016	50.30	344.52
		12/7/2016	50.11	344.71
		1/18/2017	50.03	344.79
		2/28/2017	50.15	344.67
		4/10/2017	50.47	344.35
		5/11/2017	50.51	344.31
		6/19/2017	50.85	343.97
		7/25/2017	50.99	343.83
		9/6/2017	51.56	343.26
		1/29/2018	52.25	342.57
		4/30/2018	Not Measured	Not Measured
		10/15/2018	53.56	341.26
OW-26D	394.28	10/27/2016	49.94	344.34
		12/7/2016	49.78	344.50
		1/18/2017	49.7	344.58
		2/28/2017	49.79	344.49
		4/10/2017	50.13	344.15
		5/11/2017	50.19	344.09
		6/19/2017	50.48	343.80
		7/25/2017	50.75	343.53
		9/6/2017	50.93	343.35
		1/29/2018	51.89	342.39
		4/30/2018	Not Measured	Not Measured
		10/15/2018	53.15	341.13
MW-25S	361.36	10/27/2016	Not Measured	Not Measured
		12/7/2016	41.91	319.45
		1/18/2017	41.97	319.39
		3/1/2017	42.69	318.67
		4/10/2017	42.61	318.75
		5/11/2017	42.28	319.08
		6/20/2017	42.53	318.83
		7/25/2017	43.59	317.77
		9/6/2017	43.64	317.72
		1/29/2018	42.04	319.32
		4/30/2018	Not Measured	Not Measured
		10/15/2018	42.25	319.11
OW-25D	361.41	10/27/2016	Not Measured	Not Measured
		12/7/2016	42.30	319.11
		1/18/2017	42.12	319.29
		3/1/2017	42.88	318.53
		4/10/2017	42.22	319.19
		5/11/2017	41.91	319.50
		6/20/2017	42.16	319.25
		7/25/2017	43.33	318.08
		9/6/2017	43.02	318.39
		1/29/2018	41.57	319.84
		4/30/2018	Not Measured	Not Measured
		10/15/2018	41.30	320.11

Table 1
Summary of Historical CCR Static Water Level Data
Bremo Power Station

Well Identification	Top of Casing Elevation (feet AMSL)	Measurement Date	Depth to Water (feet below top of casing)	Groundwater Elevation (feet AMSL)
MW-29S	387.32	10/27/2016	38.81	348.51
Formerly		12/7/2016	39.31	348.01
OW-29S		1/18/2017	39.70	347.62
		2/28/2017	40.07	347.25
		4/10/2017	40.38	346.94
		5/11/2017	40.31	347.01
		6/19/2017	40.53	346.79
		7/25/2017	40.84	346.48
		9/6/2017	41.42	345.90
		1/29/2018	43.38	343.94
		5/1/2018	44.00	343.32
		10/15/2018	42.21	345.11
MW-29D	390.43	10/31/2017	145.32	245.11
		12/7/2016	56.35	334.08
		1/18/2017	41.60	348.83
		2/28/2017	42.38	348.05
		4/10/2017	42.60	347.83
		5/11/2017	43.54	346.89
		6/19/2017	42.93	347.50
		7/25/2017	43.56	346.87
		9/6/2017	43.79	346.64
		1/29/2018	44.85	345.58
		5/1/2018	45.90	344.53
		10/15/2018	44.32	346.11
MW-28	329.87	10/27/2016	29.13	300.74
		12/7/2016	29.72	300.15
		1/18/2017	30.29	299.58
		3/1/2017	30.66	299.21
		4/10/2017	31.04	298.83
		5/11/2017	31.28	298.59
		6/19/2017	31.99	297.88
		7/25/2017	33.09	296.78
		9/6/2017	BTOP	BTOP
		1/29/2018	37.15	292.72
		4/30/2018	Not Measured	Not Measured
		10/15/2018	36.85	293.02
MW-27S	330.88	10/27/2016	67.22	263.66
		12/7/2016	24.61	306.27
		1/18/2017	25.92	304.96
		3/1/2017	26.57	304.31
		4/10/2017	27.38	303.50
		5/11/2017	28.22	302.66
		6/19/2017	29.66	301.22
		7/25/2017	31.08	299.80
		9/6/2017	32.91	297.97
		1/29/2018	36.95	293.93
		4/30/2018	Not Measured	Not Measured
		10/15/2018	37.06	293.82
MW-27D	329.22	11/1/2016	145.69	183.53
		12/7/2016	186.96	142.26
		1/18/2017	161.82	167.40
		3/1/2017	148.41	180.81
		4/10/2017	141.55	187.67
		5/11/2017	129.28	199.94
		6/19/2017	79.81	249.41
		7/25/2017	38.71	290.51
		9/6/2017	32.68	296.54
		1/29/2018	35.25	293.97
		4/30/2018	36.13	293.09
		10/15/2018	35.76	293.46

Table 1
Summary of Historical CCR Static Water Level Data
Bremo Power Station

Well Identification	Top of Casing Elevation (feet AMSL)	Measurement Date	Depth to Water (feet below top of casing)	Groundwater Elevation (feet AMSL)
MW-33	336.5	10/27/2016	105.29	231.21
		12/7/2016	80.40	256.10
		1/18/2017	80.98	255.52
		3/1/2017	81.50	255.00
		4/10/2017	82.52	253.98
		5/11/2017	83.81	252.69
		6/20/2017	85.42	251.08
		7/25/2017	87.08	249.42
		9/6/2017	88.22	248.28
		1/29/2018	92.34	244.16
		4/30/2018	92.56	243.94
		10/15/2018	90.75	245.75
MW-34	338.18	10/31/2016	80.77	257.41
		12/7/2016	81.15	257.03
		1/18/2017	80.96	257.22
		2/28/2017	81.61	256.57
		4/10/2017	83.63	254.55
		5/11/2017	85.29	252.89
		6/20/2017	87.27	250.91
		7/25/2017	88.85	249.33
		9/6/2017	90.22	247.96
		1/29/2018	92.31	245.87
		4/30/2018	102.14	236.04
		10/15/2018	103.79	234.39
MW-35	335.65	10/27/2016	98.86	236.79
		12/7/2016	98.85	236.80
		1/18/2017	98.68	236.97
		2/28/2017	99.01	236.64
		4/10/2017	99.32	236.33
		5/11/2017	101.19	234.46
		6/20/2017	102.12	233.53
		7/25/2017	104.3	231.35
		9/6/2017	106.1	229.55
		1/29/2018	106.79	228.86
		4/30/2018	107.33	228.32
		10/15/2018	108.97	226.68
MW-24	346.04	10/28/2016	52.28	293.76
		12/7/2016	53.72	292.32
		1/18/2017	53.75	292.29
		2/28/2017	55.59	290.45
		4/10/2017	58.25	287.79
		5/11/2017	59.55	286.49
		6/20/2017	61.15	284.89
		7/25/2017	64.32	281.72
		9/6/2017	65.73	280.31
		1/29/2018	69.36	276.68
		4/30/2018	70.89	275.15
		10/15/2018	74.45	271.59

Notes: CCR = Coal Combustion Residuals
ft = feet
AMSL = Above Mean Sea Level

Table 2
Summary of Initial Assessment Monitoring Program Event Data (January 2018)
North Ash Pond, Bremo Power Station

		Ugrpadient Wells												Downgradient Wells											
Sample ID:		**MW-11**				**MW-29S**				**MW-29D**				**MW-24**				**MW-27D**				**MW-33**			
Sample Date:		**01/29/2018**				**01/29/2018**				**01/29/2018**				**01/30/2018**				**01/29/2018**				**01/30/2018**			
Parameter Name	**Unit**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**
CCR Appendix IV Constituents																									
Antimony	µg/L	<3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Arsenic	µg/L	< 0.21		0.21	0.50	< 0.21		0.21	0.50	**4.3**		0.21	0.50	**0.94**		0.21	0.50	< 0.21		0.21	0.50	**0.46**	**J**	0.21	0.50
Barium	µg/L	**3.5**	**J**	2.5	5.0	**35.6**		2.5	5.0	**33.1**		2.5	5.0	**49.7**		2.5	5.0	**49.0**		2.5	5.0	**22.1**		2.5	5.0
Beryllium	µg/L	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Cadmium	µg/L	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 2.5		0.50	1.0	< 0.50		0.50	1.0
Chromium	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Cobalt	µg/L	**0.62**		0.15	0.50	**1.2**		0.15	0.50	**0.55**		0.15	0.50	**1.3**		0.15	0.50	**0.40**	**J**	0.15	0.50	< 0.15		0.15	0.50
Fluoride	mg/L	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.11**		0.050	0.10	< 0.050		0.050	0.10	**0.15**		0.050	0.10	**0.062**	**J**	0.050	0.10
Lead	µg/L	**0.032**	**J+**	0.028	0.1	**0.045**	**J+**	0.028	0.1	**0.38**	**J+**	0.028	0.1	**0.046**	**J+**	0.028	0.1	< 0.028		0.028	0.1	**0.11**	**J+**	0.028	0.1
Lithium	µg/L	**0.43**	**J**	0.17	0.50	**0.75**		0.17	0.50	**2.7**		0.17	0.50	**1.9**		0.17	0.50	**68.0**		0.17	0.50	**4.3**		0.17	0.50
Mercury	µg/L	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	**27.9**		2.5	5.0	**28.7**		2.5	5.0	**5.2**		2.5	5.0
Total Radium	pCi/L	**0.477**	**U**	1.45	1.45	**1.01**	**U**	1.45	1.45	**0.635**	**U**	1.45	1.45	**0.640**	**U**	1.45	1.45	**0.779**	**U**	1.45	1.45	**1.67**		1.45	1.45
Selenium	µg/L	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10
Thallium	µg/L	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10
Field Measurements																									
Conductivity	µS/cm	224.6		0.1	0.1	255.9		0.1	0.1	868		0.1	0.1	537		0.1	0.1	1681		0.1	0.1	605		0.1	0.1
Depth to Water	ft/btoc	30.77		0.01	0.01	43.38		0.01	0.01	44.85		0.01	0.01	69.36		0.01	0.01	35.25		0.01	0.01	92.34		0.01	0.01
Dissolved Oxygen	mg/L	4.27		0.01	0.01	4.23		0.01	0.01	4.77		0.01	0.01	0.52		0.01	0.01	1.68		0.01	0.01	3.06		0.01	0.01
Groundwater Elevation	ft/AMSL	299.75		0.01	0.01	343.94		0.01	0.01	345.58		0.01	0.01	276.68		0.01	0.01	293.97		0.01	0.01	244.16		0.01	0.01
Oxidation Reduction Potential	millivolts	229.9		0.1	0.1	92.2		0.1	0.1	-100.9		0.1	0.1	-162.3		0.1	0.1	13.4		0.1	0.1	90.1		0.1	0.1
pH	SU	5.33		0.10	0.10	5.97		0.10	0.10	6.80		0.10	0.10	7.52		0.10	0.10	6.63		0.10	0.10	6.53		0.10	0.10
Temperature	C	13.8		0.01	0.01	11.8		0.01	0.01	10.6		0.01	0.01	12.7		0.01	0.01	12.2		0.01	0.01	11.8		0.01	0.01
Turbidity	NTU	5.4		0.1	0.1	5.0		0.1	0.1	8.4		0.1	0.1	5.5		0.1	0.1	1.7		0.1	0.1	3.3		0.1	0.1

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
CCR = Coal Combustion Residuals
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
J+ = Potential Bias High
U = Not detected above the Minimum Detection Concentration

Table 2
Summary of Initial Assessment Monitoring Program Event Data (January 2018)
North Ash Pond, Bremo Power Station

		Downgadient Wells								Lab QC				Field QC							
Sample ID:		**MW-34**				**MW-35**				**MW-11 DUP**				**Field Blank**				**Equipment Blank**			
Sample Date:		**01/29/2018**				**01/29/2018**				**01/29/2018**				**01/30/2018**				**1/29/2018**			
Parameter Name	**Unit**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**
CCR Appendix IV Constituents																					
Antimony	µg/L	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Arsenic	µg/L	< 0.21		0.21	0.50	**1.9**		0.21	0.50	< 0.21		0.21	0.50	< 0.21		0.21	0.50	< 0.21		0.21	0.50
Barium	µg/L	**42.8**		2.5	5.0	**105**		2.5	5.0	**3.4**	**J**	2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Beryllium	µg/L	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Cadmium	µg/L	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Chromium	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Cobalt	µg/L	< 0.15		0.15	0.50	**0.25**	**J**	0.15	0.50	**0.50**	**J**	0.15	0.50	< 0.15		0.15	0.50	< 0.15		0.15	0.50
Fluoride	mg/L	**0.055**	**J**	0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Lead	µg/L	< 0.028		0.028	0.1	< 0.028		0.028	0.1	< 0.028		0.028	0.1	< 0.028		0.028	0.1	**0.054**	**J**	0.028	0.1
Lithium	µg/L	**7.7**		0.17	0.50	**35.7**		0.17	0.50	**0.42**	**J**	0.17	0.50	< 0.17		0.17	0.50	< 0.17		0.17	0.50
Mercury	µg/L	**0.27**		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	< 2.5		2.5	5.0	**2.7**	**J**	2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Total Radium	pCi/L	**0.952**	**U**	1.45	1.45	**1.77**		1.45	1.45	**0.716**	**U**	1.45	1.45	**0.325**	**U**	1.45	1.45	**0.385**	**U**	1.45	1.45
Selenium	µg/L	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10	< 5.0		5.0	10
Thallium	µg/L	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10	< 0.028		0.028	0.10
Field Measurements																					
Conductivity	µS/cm	390.6		0.1	0.1	495.9		0.1	0.1	--		--	--	--		--	--	--		--	--
Depth to Water	ft/btoc	92.31		0.01	0.01	106.79		0.01	0.01	--		--	--	--		--	--	--		--	--
Dissolved Oxygen	mg/L	0.42		0.01	0.01	0.75		0.01	0.01	--		--	--	--		--	--	--		--	--
Groundwater Elevation	ft/AMSL	245.87		0.01	0.01	228.86		0.01	0.01	--		--	--	--		--	--	--		--	--
Oxidation Reduction Potential	millivolts	215.0		0.1	0.1	-127.9		0.1	0.1	--		--	--	--		--	--	--		--	--
pH	SU	6.13		0.10	0.10	7.21		0.10	0.10	--		--	--	--		--	--	--		--	--
Temperature	C	13.2		0.01	0.01	13.4		0.01	0.01	--		--	--	--		--	--	--		--	--
Turbidity	NTU	2.0		0.1	0.1	9.1		0.1	0.1	--		--	--	--		--	--	--		--	--

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
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ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
CCR = Coal Combustion Residuals
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
J+ = Potential Bias High
U = Not detected above the Minimum Detection Concentration

Table 3
Summary of 1st Semi-Annual Assessment Monitoring Program Sampling Event Data (April and May 2018)
North Ash Pond, Bremo Power Station

					Upgradient Wells												Downgradient Wells											
					Sample ID:	MW-11				MW-29S				MW-29D				MW-24				MW-27D				MW-33			
					Sample Date:	04/30/2018				05/01/2018				05/01/2018				05/01/2018				04/30/2018				04/30/2018			
Parameter Name	Units	CCR Site-Specific Background	CCR GWPS	Virginia CCR GWPS		Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL
CCR Appendix III Constituents																													
Boron	mg/L	0.0692	--	--		< 0.025		0.025	0.050	< 0.025		0.025	0.050	**0.054**		0.025	0.050	**0.17**		0.025	0.050	**0.96**		0.025	0.050	**0.22**		0.025	0.050
Calcium	mg/L	58.9	--	--		**19.6**		0.050	0.10	**15.8**		0.050	0.10	**47.3**		0.050	0.10	**47.4**		0.050	0.10	**63.8**		0.050	0.10	**73.7**		0.050	0.10
Chloride	mg/L	60.3	--	--		**9.4**		0.50	1.0	**29.3**		0.50	1.0	**45.2**		0.50	1.0	**32.9**		0.50	1.0	**13.3**		0.50	1.0	**19.6**		0.50	1.0
Fluoride	mg/L	0.1	--	--		< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.15**		0.050	0.10	**0.069**	J	0.050	0.10	**0.15**		0.050	0.10	**0.061**	J	0.050	0.10
pH	SU	4.04-7.72	4	4		4.94		0.10	0.10	5.72		0.10	0.10	6.93		0.10	0.10	7.38		0.10	0.10	6.30		0.10	0.10	6.36		0.10	0.10
Sulfate	mg/L	179	--	--		**6.2**		0.50	1.0	**26.2**		0.50	1.0	**99.6**		1.0	2.0	**28.1**		0.50	1.0	**408**		4.0	8.0	**42.5**		0.50	1.0
Total Dissolved Solids	mg/L	570	--	--		**141**		25.0	25.0	**178**		25.0	25.0	**612**		50.0	50.0	**283**		25.0	25.0	**1050**		50.0	50.0	**340**		25.0	25.0
Detected CCR Appendix IV Constituents																													
Arsenic	µg/L	3.8	10	10		< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0
Barium	µg/L	54	2000	2000		**3.1**	J	2.5	5.0	**37.3**		2.5	5.0	**27.1**		2.5	5.0	**56.6**		2.5	5.0	**39.1**		2.5	5.0	**23.3**		2.5	5.0
Cobalt	µg/L	13.2	13.2	13.2		< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Fluoride	µg/L	QL (100)	4000	4000		< 50		50	100	< 50		50	100	**150**		50	100	**69**	J	50	100	**150**		50	100	**61**	J	50	100
Lead	µg/L	QL (1)	15	QL (1)		< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Lithium	µg/L	QL (25)	40	QL (25)		**0.48**	J	0.17	0.50	**0.80**		0.17	0.50	**2.0**		0.17	0.50	**1.9**		0.17	0.50	**57.6**		0.17	0.50	**3.5**		0.17	0.50
Mercury	µg/L	QL (0.2)	2	2		< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	24.4	100	24.4		< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	**24.0**		2.5	5.0	**16.1**		2.5	5.0	**4.0**	J	2.5	5.0
Total Radium	pCi/l	MDC	5	5		**0.287**	U	1.84	1.84	**0.0797**	U	1.79	1.79	**0.864**	U	1.57	1.57	**1.10**	U	1.50	1.50	**1.36**	U	1.61	1.61	**0.440**	U	1.80	1.80
Field Measurements																													
Conductivity	uS/cm	--	--	--		224		0.1	0.1	254		0.1	0.1	939		0.1	0.1	546		0.1	0.1	1535		0.1	0.1	630		0.1	0.1
Depth to Water	ft btoc	--	--	--		30.01		0.01	0.01	44.00		0.01	0.01	45.90		0.01	0.01	70.89		0.01	0.01	36.13		0.01	0.01	92.56		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--		6.28		0.01	0.01	6.41		0.01	0.01	5.3		0.01	0.01	0.35		0.01	0.01	7.54		0.01	0.01	9.35		0.01	0.01
Groundwater Elevation	ft/AMSL	--	--	--		300.51		0.01	0.01	343.32		0.01	0.01	344.53		0.01	0.01	275.15		0.01	0.01	293.09		0.01	0.01	243.94		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--		203.4		0.1	0.1	86.6		0.1	0.1	-68.5		0.1	0.1	-158.2		0.1	0.1	38.8		0.1	0.1	50.2		0.1	0.1
Temperature	C	--	--	--		15.83		0.01	0.01	15.92		0.01	0.01	15.60		0.01	0.01	16.28		0.01	0.01	15.84		0.01	0.01	18.51		0.01	0.01
Turbidity	NTU	--	--	--		1.9		0.1	0.1	9.6		0.1	0.1	8.5		0.1	0.1	4.7		0.1	0.1	0.5		0.1	0.1	3.3		0.1	0.1

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals
QL = Quantitation Limit
GWPS = Groundwater Protection Standards
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
U = Not detected above the Minimum Detection Concentration

= Concentration greater than site specific background

= Concentration greater than CCR GWPS, Virginia CCR GWPS, and site background

= Concentration greater than Virginia CCR GWPS and site background

Table 3
Summary of 1st Semi-Annual Assessment Monitoring Program Sampling Event Data (April and May 2018)
North Ash Pond, Bremo Power Station

					Downgradient Wells								Lab QC				Field QC							
				Sample ID:	MW-34				MW-35				MW-11 - DUP				Field Blank				Equipment Blank			
				Sample Date:	05/01/2018				05/01/2018				04/30/2018				04/30/2018				05/01/2018			
Parameter Name	Units	CCR Site-Specific Background	CCR GWPS	Virginia CCR GWPS	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL	Result	Qual	MDL	RL
CCR Appendix III Constituents																								
Boron	mg/L	0.0692	--	--	**1.2**		0.025	0.050	**0.28**		0.025	0.050	< 0.025		0.025	0.050	< 0.025		0.025	0.050	< 0.025		0.025	0.050
Calcium	mg/L	58.9	--	--	**36.8**		0.050	0.10	**53.2**		0.050	0.10	**19.6**		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Chloride	mg/L	60.3	--	--	**13.6**		0.50	1.0	**9.9**		0.50	1.0	**9.6**		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Fluoride	mg/L	0.1	--	--	**0.053**	J	0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
pH	SU	4.04-7.72	4	4	5.95		0.10	0.10	7.27		0.10	0.10	--		--	--	--		--	--	--		--	--
Sulfate	mg/L	179	--	--	**27.0**		0.50	1.0	**31.2**		0.50	1.0	**6.1**		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Total Dissolved Solids	mg/L	570	--	--	**252**		25.0	25.0	**294**		25.0	25.0	**147**		25.0	25.0	< 25.0		25.0	25.0	< 25.0		25.0	25.0
Detected CCR Appendix IV Constituents																								
Arsenic	µg/L	3.8	10	10	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0
Barium	µg/L	54	2000	2000	**44.4**		2.5	5.0	**108**		2.5	5.0	**3.1**	J	2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Cobalt	µg/L	13.2	13.2	13.2	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Fluoride	µg/L	QL (100)	4000	4000	**53**	J	50	100	< 50		50	100	< 50		50	100	< 50		50	100	< 50		50	100
Lead	µg/L	QL (1)	15	QL (1)	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Lithium	µg/L	QL (25)	40	QL (25)	**6.7**		0.17	0.50	**33.1**		0.17	0.50	**0.55**		0.17	0.50	**0.18**	J	0.17	0.50	**0.18**	J	0.17	0.50
Mercury	µg/L	QL (0.2)	2	2	**0.38**		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	24.4	100	24.4	< 2.5		2.5	5.0	**3.4**	J	2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Total Radium	pCi/l	MDC	5	5	**0.160**	U	1.20	1.20	**0.839**	U	1.44	1.44	**1.01**	U	1.31	1.31	**0.626**	U	1.30	1.30	**0.164**	U	1.27	1.27
Field Measurements																								
Conductivity	uS/cm	--	--	--	386		0.1	0.1	470		0.1	0.1	--		--	--	--		--	--	--		--	--
Depth to Water	ft btoc	--	--	--	102.14		0.01	0.01	107.33		0.01	0.01	--		--	--	--		--	--	--		--	--
Dissolved Oxygen	mg/L	--	--	--	4.80		0.01	0.01	1.36		0.01	0.01	--		--	--	--		--	--	--		--	--
Groundwater Elevation	ft/AMSL	--	--	--	236.04		0.01	0.01	228.32		0.01	0.01	--		--	--	--		--	--	--		--	--
Oxidation Reduction Potential	millivolts	--	--	--	449.5		0.1	0.1	-133.8		0.1	0.1	--		--	--	--		--	--	--		--	--
Temperature	C	--	--	--	15.78		0.01	0.01	16.00		0.01	0.01	--		--	--	--		--	--	--		--	--
Turbidity	NTU	--	--	--	2.4		0.1	0.1	4.8		0.1	0.1	--		--	--	--		--	--	--		--	--

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals
QL = Quantitation Limit
GWPS = Groundwater Protection Standards
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
U = Not detected above the Minimum Detection Concentration

= Concentration greater than site specific background

= Concentration greater than CCR GWPS, Virginia CCR GWPS, and site background

= Concentration greater than Virginia CCR GWPS and site background

Table 4
Summary of 2nd Semi-Annual Assessment Monitoring Program Sampling Event Data (October 2018)
North Ash Pond, Bremo Power Station

		Upgradient Wells												Downgradient Wells											
Sample ID:		**MW-11**				**MW-29S**				**MW-29D**				**MW-24**				**MW-27D**				**MW-33**			
Sample Date:		**10/15/2018**				**10/15/2018**				**10/15/2018**				**10/15/2018**				**10/15/2018**				**10/16/2018**			
Parameter Name	**Units**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**
CCR Appendix III Constituents																									
Boron	mg/L	< 0.025		0.025	0.050	< 0.025		0.025	0.050	**0.045**	**J**	0.025	0.050	**0.16**		0.025	0.050	**1.3**		0.025	0.050	**0.22**		0.025	0.050
Calcium	mg/L	**19.6**		0.050	0.10	**23.8**		0.050	0.10	**52.5**		0.050	0.10	**49.6**		0.050	0.10	**68.2**		0.050	0.10	**93.7**		0.050	0.10
Chloride	mg/L	**10.2**		0.50	1.0	**45.5**		0.50	1.0	**63.4**		0.50	1.0	**42.0**		0.50	1.0	**14.8**		0.50	1.0	**22.3**		0.50	1.0
Fluoride	mg/L	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.11**		0.050	0.10	**0.079**	**J**	0.050	0.10	**0.15**		0.050	0.10	**0.065**	**J**	0.050	0.10
pH	SU	5.32		0.01	0.01	5.70		0.01	0.01	6.99		0.01	0.01	7.40		0.01	0.01	6.43		0.01	0.01	6.49		0.01	0.01
Sulfate	mg/L	**6.5**		0.50	1.0	**49.4**		0.50	1.0	**112**		0.50	1.0	**32.8**		0.50	1.0	**302**		0.50	1.0	**47.0**		0.50	1.0
Total Dissolved Solids	mg/L	**145**		25.0	25.0	**250**		25.0	25.0	**559**		25.0	25.0	**311**		25.0	25.0	**876**		25.0	25.0	**385**		25.0	25.0
Detected CCR Appendix IV Constituents																									
Arsenic	µg/L	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0
Barium	µg/L	**2.8**	**J**	2.5	5.0	**59.0**		2.5	5.0	**33.2**		2.5	5.0	**60.0**		2.5	5.0	**23.9**		2.5	5.0	**37.3**		2.5	5.0
Cobalt	µg/L	**0.42**	**J**	0.085	0.50	**0.82**		0.085	0.50	**0.76**		0.085	0.50	**1.1**		0.085	0.50	**0.13**	**J**	0.085	0.50	**0.25**	**J**	0.085	0.50
Fluoride	µg/L	< 50		50	100	< 50		50	100	**110**		50	100	**79**	**J**	50	100	**150**		50	100	**65**	**J**	50	100
Lead	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Lithium	µg/L	**0.43**	**J**	0.070	2.5	**0.77**	**J**	0.070	2.5	**2.1**	**J**	0.070	2.5	**1.6**	**J**	0.070	2.5	**51.0**		0.070	2.5	**1.6**	**J**	0.070	2.5
Mercury	µg/L	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	**21.6**		2.5	5.0	**8.2**		2.5	5.0	**4.6**	**J**	2.5	5.0
Total Radium	pCi/l	**1.37**	**U**	1.50	1.50	**0.534**	**U**	1.43	1.43	**1.27**	**U**	1.90	1.90	**2.00**		1.85	1.85	**1.43**	**U**	1.46	1.46	**1.61**	**U**	1.83	1.83
Field Measurements																									
Conductivity	uS/cm	218.0		0.1	0.1	349.1		0.1	0.1	920		0.1	0.1	630		0.1	0.1	1380		0.1	0.1	700		0.1	0.1
Depth to Water	ft btoc	28.06		0.01	0.01	42.21		0.01	0.01	44.32		0.01	0.01	74.45		0.01	0.01	35.76		0.01	0.01	90.75		0.01	0.01
Dissolved Oxygen	mg/L	4.42		0.01	0.01	4.79		0.01	0.01	2.75		0.01	0.01	0.44		0.01	0.01	0.76		0.01	0.01	2.66		0.01	0.01
Groundwater Elevation	ft/amsl	302.46		0.01	0.01	345.11		0.01	0.01	346.11		0.01	0.01	271.59		0.01	0.01	293.46		0.01	0.01	245.75		0.01	0.01
Oxidation Reduction Potential	millivolts	190.7		0.1	0.1	126.7		0.1	0.1	-112.8		0.1	0.1	-162.4		0.1	0.1	22.9		0.1	0.1	21.4		0.1	0.1
Temperature	C	15.0		0.01	0.01	14.9		0.01	0.01	15.0		0.01	0.01	16.1		0.01	0.01	16.4		0.01	0.01	16.3		0.01	0.01
Turbidity	NTU	6.0		0.1	0.1	6.3		0.1	0.1	9.4		0.1	0.1	2.9		0.1	0.1	1.1		0.1	0.1	3.5		0.1	0.1

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
CCR = Coal Combustion Residuals
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
U = Not detected above the Minimum Detection Concentration

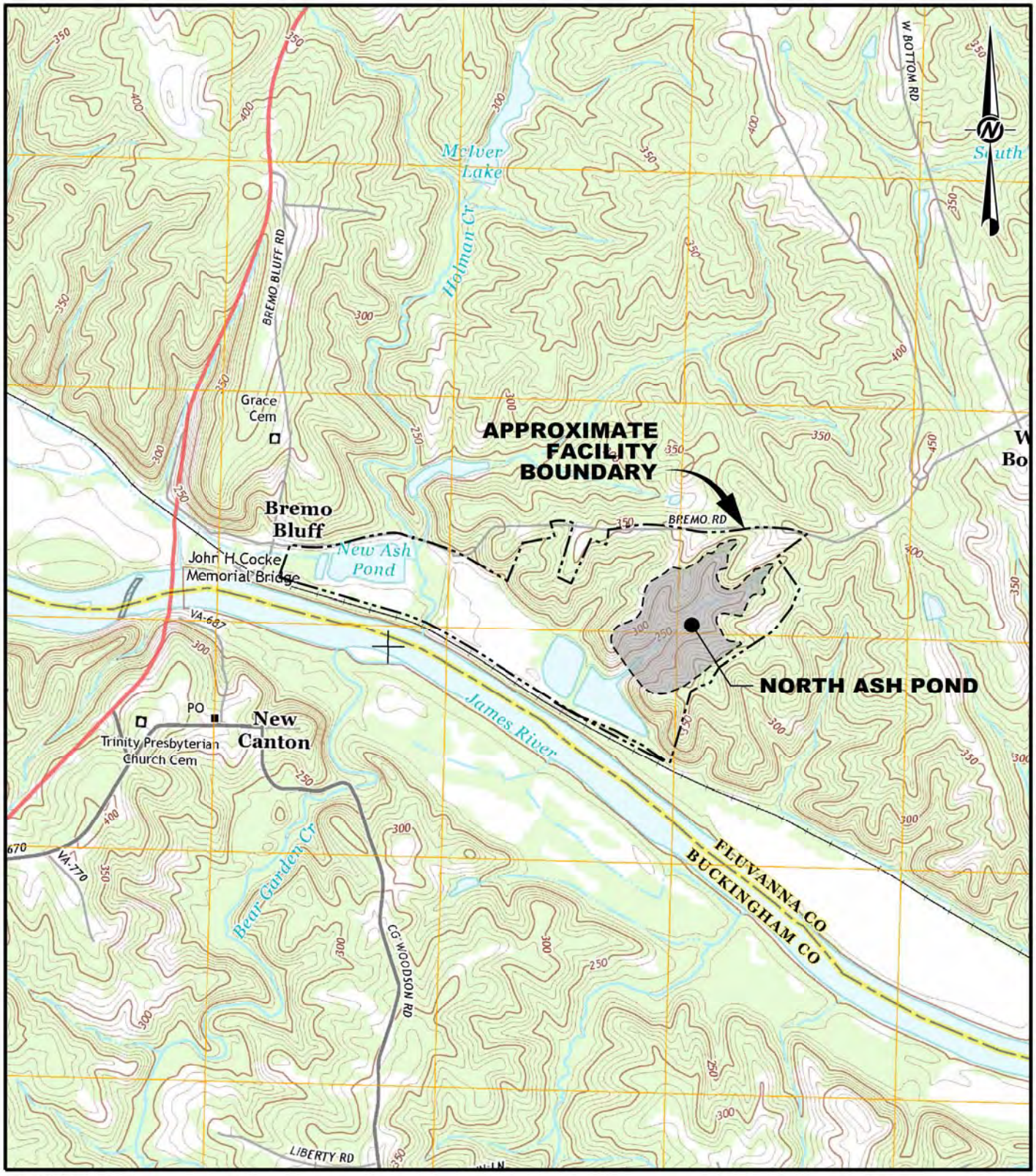
Table 4
Summary of 2nd Semi-Annual Assessment Monitoring Program Sampling Event Data (October 2018)
North Ash Pond, Bremo Power Station

		Downgradient Wells								Lab QC				Field QC							
Sample ID:		**MW-34**				**MW-35**				**MW-11 - DUP**				**Field Blank**				**Equipment Blank**			
Sample Date:		**10/16/2018**				**10/16/2018**				**10/15/2018**				**10/16/2018**				**10/16/2018**			
Parameter Name	**Units**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**	**Result**	**Qual**	**MDL**	**RL**
CCR Appendix III Constituents																					
Boron	mg/L	**1.2**		0.025	0.050	**0.41**		0.025	0.050	< 0.025		0.025	0.050	< 0.025		0.025	0.050	< 0.025		0.025	0.050
Calcium	mg/L	**36.8**		0.050	0.10	**48.1**		0.050	0.10	**20.4**		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Chloride	mg/L	**14.0**		0.50	1.0	**10.5**		0.50	1.0	**10.4**		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Fluoride	mg/L	**0.054**	**J**	0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
pH	SU	5.97		0.01	0.01	7.22		0.01	0.01	--		--	--	--		--	--	--		--	--
Sulfate	mg/L	**27.5**		0.50	1.0	**34.6**		0.50	1.0	**6.4**		0.50	1.0	< 0.50		0.50	1.0	< 0.50		0.50	1.0
Total Dissolved Solids	mg/L	**254**		25.0	25.0	**303**		25.0	25.0	**144**		25.0	25.0	< 25.0		25.0	25.0	< 25.0		25.0	25.0
Detected CCR Appendix IV Constituents																					
Arsenic	µg/L	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0	< 5.0		5.0	10.0
Barium	µg/L	**44.2**		2.5	5.0	**101**		2.5	5.0	**3.2**	**J**	2.5	5.0	< 2.5		2.5	5.0	**5.0**		2.5	5.0
Cobalt	µg/L	< 0.085		0.085	0.50	**0.22**	**J**	0.085	0.50	**0.44**	**J**	0.085	0.50	< 0.085		0.085	0.50	< 0.085		0.085	0.50
Fluoride	µg/L	**54**	**J**	50	100	< 50		50	100	< 50		50	100	< 50		50	100	< 50		50	100
Lead	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Lithium	µg/L	**7.1**		0.070	2.5	**16.7**		0.070	2.5	**0.37**	**J**	0.070	2.5	**0.096**	**J**	0.070	2.5	< 0.070		0.070	2.5
Mercury	µg/L	**0.46**		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20	< 0.10		0.10	0.20
Molybdenum	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Total Radium	pCi/l	**0.564**	**U**	1.60	1.60	**1.56**	**U**	2.08	2.08	**0.550**	**U**	1.71	1.71	**0.605**	**U**	1.83	1.83	**0.490**	**U**	2.01	2.01
Field Measurements																					
Conductivity	uS/cm	373.5		0.1	0.1	464.1		0.1	0.1	--		--	--	--		--	--	--		--	--
Depth to Water	ft btoc	103.79		0.01	0.01	108.97		0.01	0.01	--		--	--	--		--	--	--		--	--
Dissolved Oxygen	mg/L	1.07		0.01	0.01	1.26		0.01	0.01	--		--	--	--		--	--	--		--	--
Groundwater Elevation	ft/amsl	234.39		0.01	0.01	226.68		0.01	0.01	--		--	--	--		--	--	--		--	--
Oxidation Reduction Potential	millivolts	541.6		0.1	0.1	-126.5		0.1	0.1	--		--	--	--		--	--	--		--	--
Temperature	C	14.7		0.01	0.01	15.2		0.01	0.01	--		--	--	--		--	--	--		--	--
Turbidity	NTU	7.4		0.1	0.1	8.6		0.1	0.1	--		--	--	--		--	--	--		--	--

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram per liter
pCi/L = picoCurie per liter
µS/cm = MicroSiemen per centimeter
SU = Standard Units
C = Degrees Celsius
NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft/AMSL = feet above mean sea level
CCR = Coal Combustion Residuals
Bold font = Detected constituent

Qualifiers:
J = Estimated Result
U = Not detected above the Minimum Detection Concentration

DRAWINGS



REFERENCE

BASE MAP CONSISTS OF 7.5-MINUTE USGS TOPOGRAPHIC QUADRANGLE NAMED ARVONIA, VIRGINIA, DATED 2013.

2000 0 2000

SCALE FEET

CLIENT
DOMINION ENERGY

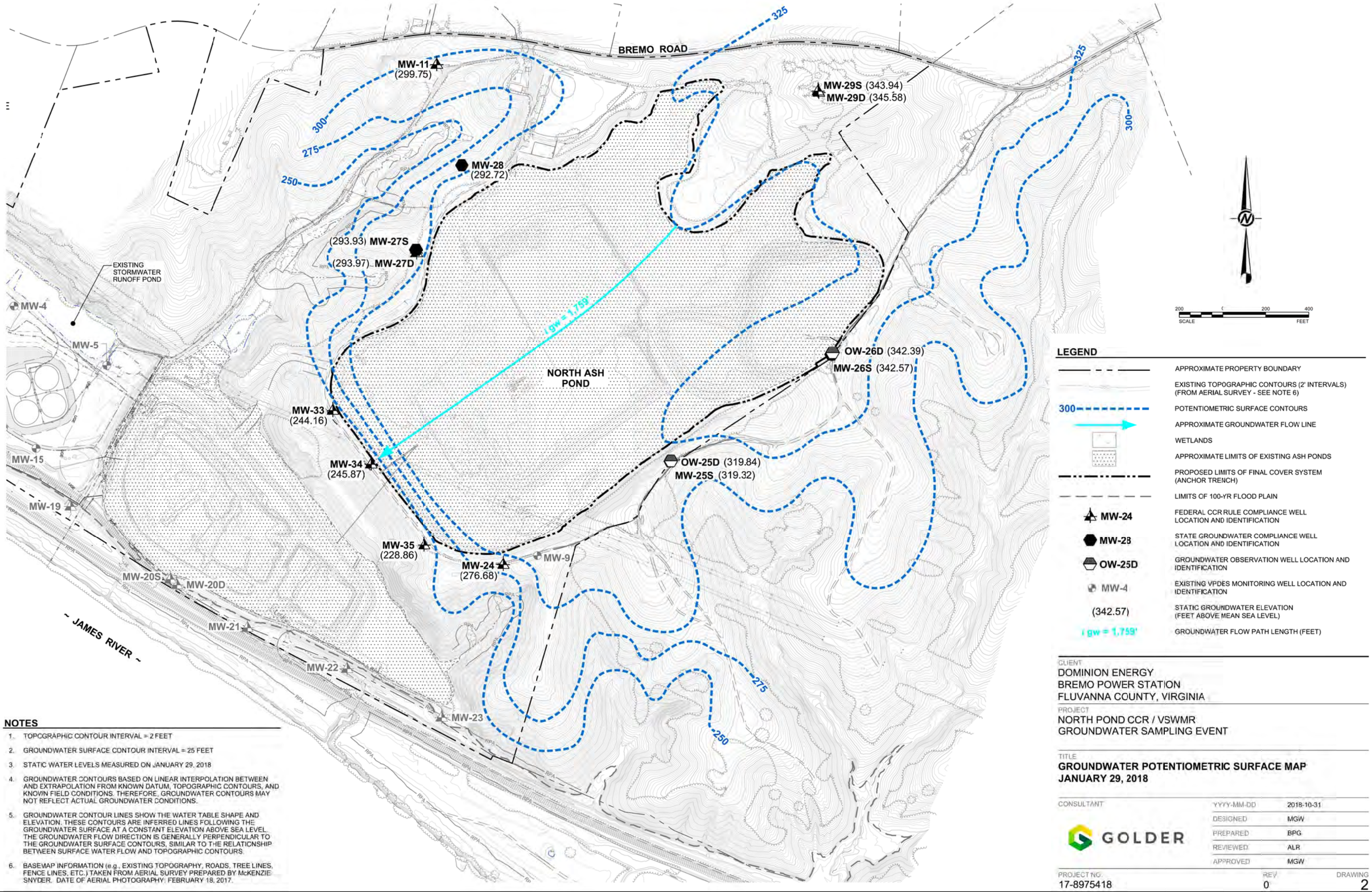
CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-31
DESIGNED	ALR
PREPARED	SIB
REVIEWED	ALR
APPROVED	MGW

PROJECT
BREMO POWER STATION
NORTH ASH POND
FLUVANNA COUNTY, VIRGINIA

TITLE
SITE LOCATION MAP

PROJECT NO. 17-8975418 | REV. 0 | DRAWING 1



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON JANUARY 29, 2018
4. GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL GROUNDWATER CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. BASEMAP INFORMATION (e.g., EXISTING TOPOGRAPHY, ROADS, TREE LINES, FENCE LINES, ETC.) TAKEN FROM AERIAL SURVEY PREPARED BY McKENZIE SNYDER. DATE OF AERIAL PHOTOGRAPHY: FEBRUARY 18, 2017.

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

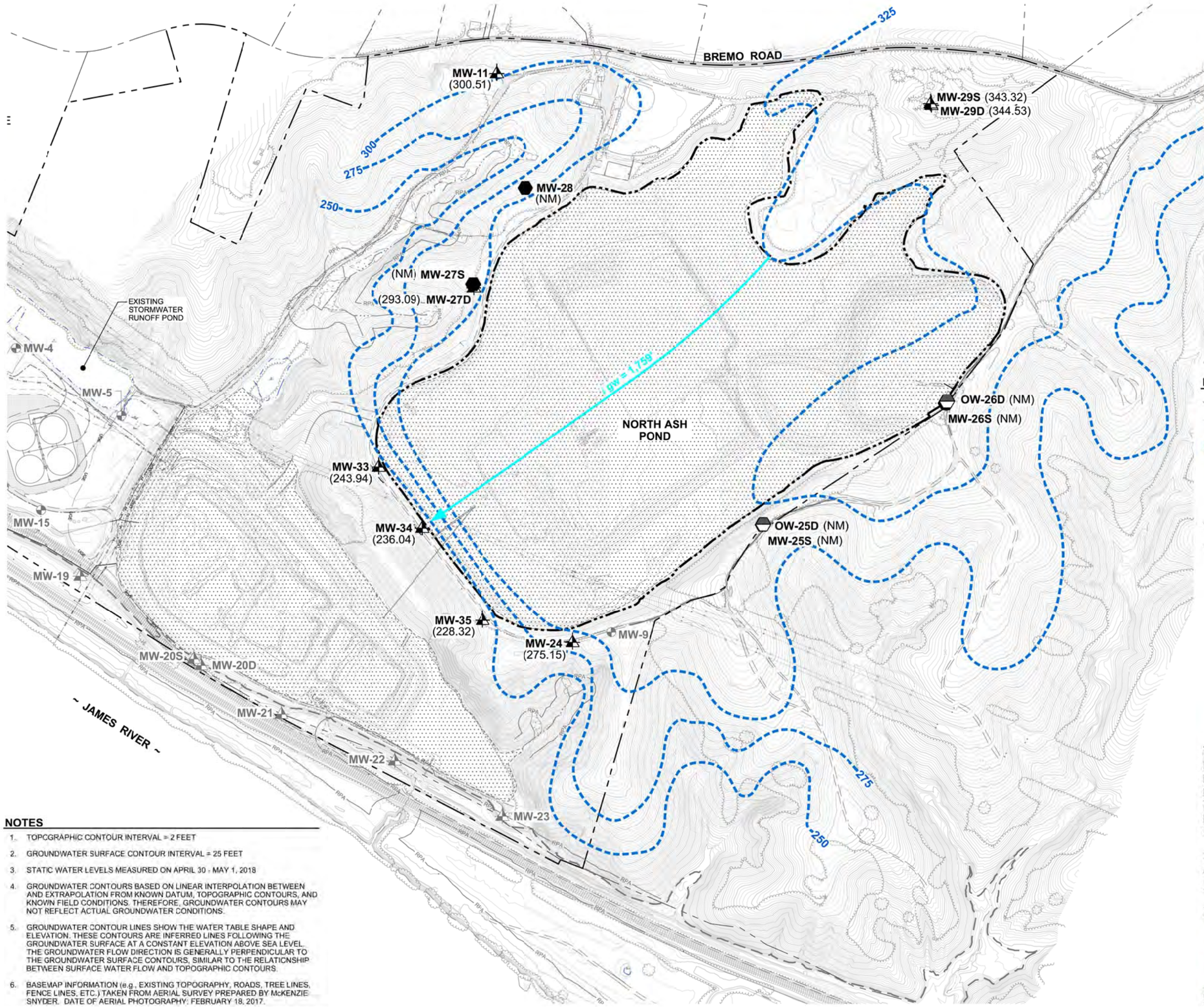
PROJECT
NORTH POND CCR / VSWMR
GROUNDWATER SAMPLING EVENT

TITLE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
JANUARY 29, 2018

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-31
DESIGNED	MGW
PREPARED	BPG
REVIEWED	ALR
APPROVED	MGW

PROJECT NO. 17-8975418 | REV 0 | DRAWING 2



LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- 300 POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- PROPOSED LIMITS OF FINAL COVER SYSTEM (ANCHOR TRENCH)
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-28 STATE GROUNDWATER COMPLIANCE WELL LOCATION AND IDENTIFICATION
- OW-25D GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- MW-4 EXISTING VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- (275.15) STATIC GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- (NM) NOT MEASURED
- gw = 1,759' GROUNDWATER FLOW PATH LENGTH (FEET)

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON APRIL 30 - MAY 1, 2018
4. GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL GROUNDWATER CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. BASEMAP INFORMATION (e.g., EXISTING TOPOGRAPHY, ROADS, TREE LINES, FENCE LINES, ETC.) TAKEN FROM AERIAL SURVEY PREPARED BY McKENZIE SNYDER. DATE OF AERIAL PHOTOGRAPHY: FEBRUARY 18, 2017.

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NORTH POND CCR
GROUNDWATER SAMPLING EVENT

TITLE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
APRIL 30 - MAY 1, 2018

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-31
DESIGNED	ALR
PREPARED	SBF
REVIEWED	ALR
APPROVED	MGW

PROJECT NO. 17-8975418 | REV. 0 | DRAWING 3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

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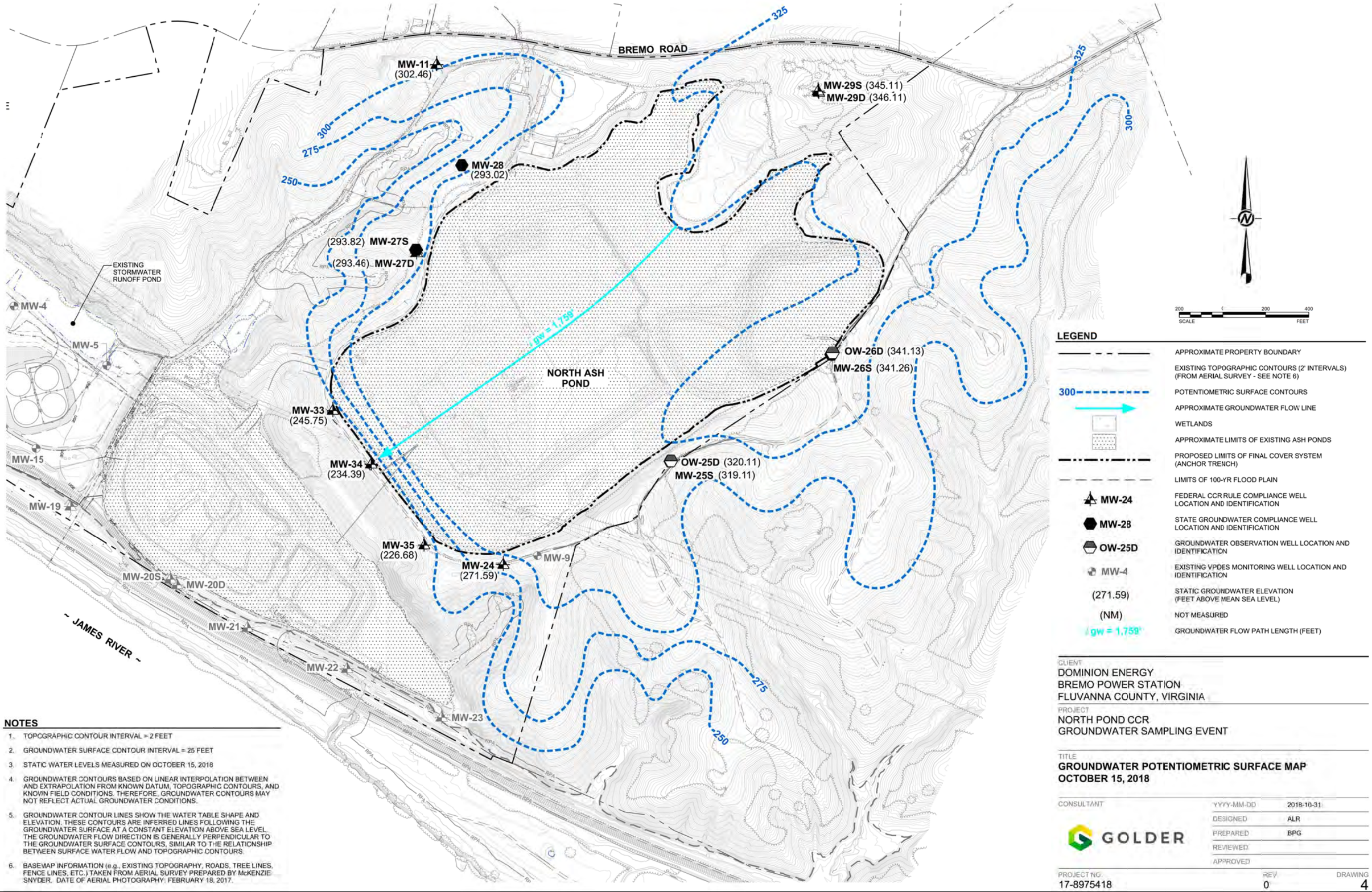

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- 300 POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- PROPOSED LIMITS OF FINAL COVER SYSTEM (ANCHOR TRENCH)
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-28 STATE GROUNDWATER COMPLIANCE WELL LOCATION AND IDENTIFICATION
- OW-25D GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- MW-4 EXISTING VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- (271.59) STATIC GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- (NM) NOT MEASURED
- gw = 1,759' GROUNDWATER FLOW PATH LENGTH (FEET)

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON OCTOBER 15, 2018
4. GROUNDWATER CONTOURS BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS, AND KNOWN FIELD CONDITIONS. THEREFORE, GROUNDWATER CONTOURS MAY NOT REFLECT ACTUAL GROUNDWATER CONDITIONS.
5. GROUNDWATER CONTOUR LINES SHOW THE WATER TABLE SHAPE AND ELEVATION. THESE CONTOURS ARE INFERRED LINES FOLLOWING THE GROUNDWATER SURFACE AT A CONSTANT ELEVATION ABOVE SEA LEVEL. THE GROUNDWATER FLOW DIRECTION IS GENERALLY PERPENDICULAR TO THE GROUNDWATER SURFACE CONTOURS, SIMILAR TO THE RELATIONSHIP BETWEEN SURFACE WATER FLOW AND TOPOGRAPHIC CONTOURS.
6. BASEMAP INFORMATION (e.g., EXISTING TOPOGRAPHY, ROADS, TREE LINES, FENCE LINES, ETC.) TAKEN FROM AERIAL SURVEY PREPARED BY McKENZIE SNYDER. DATE OF AERIAL PHOTOGRAPHY: FEBRUARY 18, 2017.

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NORTH POND CCR
GROUNDWATER SAMPLING EVENT

TITLE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
OCTOBER 15, 2018

CONSULTANT
GOLDER

YYYY-MM-DD	2018-10-31
DESIGNED	ALR
PREPARED	BPG
REVIEWED	
APPROVED	

PROJECT NO. 17-8975418 | REV 0 | DRAWING 4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI D

Path: G:\Plan Production Data Files\Drawing Data Files\17-89754 - BREMO\G - NORTH POND CCR 2018 AMR\Active Drawings\17897548R_G04.dwg

APPENDIX A

INITIAL ASSESSMENT MONITORING PROGRAM EVENT FIELD DATA SHEETS, LABORATORY CERTIFICATES OF ANALYSIS, CHAIN-OF-CUSTODY FORMS, AND DATA VALIDATION FORMS

Date: 1/29/18

GOLDER

WELL GAUGING LOG

Project Name: Bremo Power Station North Pond CCR/VSWMP SAMPLING Project No./Task No.: 1789-754.100

Sampler(s): P. Trout C. Joyner

Equipment: Water Level Indicator

Well ID	Personnel (initials)	Time	DTW (feet)	DTB (feet)	Well Condition Summary				
					Protective Casing	Well Casing	Label	Lock	Pad Condition
MW-11	PT	0901	30.77	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-29S	CJ	1149	43.38	—	☑ OK* ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-29D	CJ	0930	44.85	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-24	CJ	1645 ~~1234~~	69.36 ~~69.42~~	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-27D	PT	1201	35.25	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-33	PT	1650 ~~1335~~	92.34	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-34	PT	1533	92.31	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-35	PT	1403	106.79	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-25S	CJ	1448	42.04	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-26S	CJ	1325	52.25	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-27S	PT	1057	36.95	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
MW-28	PT	1343 ~~1059~~ CJ	37.15 ~~36.95~~ CJ	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
OW-26D	CJ	1336	51.89	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
OW-25D	CJ	1447	41.57	—	☑ OK ☐ Damaged	☑ OK ☐ Damaged	☑ OK ☐ Inadequate	☑ Yes ☐ No	☑ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged

Observations/Notes: *Lid on protective casing was very hard to get off and on but it is shut and locked

Signature: Caitlyn Joyner Date: 1/29/18

QA/QC Signature: Date: 1/31/18

Golder Associates

MICROPURGE SAMPLING LOG

Date: 1-29-2013
Weather: Rain, 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~, Act 178975 4.100
Event: North Ash Pond CCR Sampling
Sampler(s): P. Trout
Well ID: MW-11
Field Calibration Completed: 0745 on 1-29-13
Well Diameter: 2 inches
Initial Depth to Water: 30.77 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS 16M103 153
- [ ] In-Situ
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [x] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
0908	5.65	231.9	8.4	5.41	13.6	198.9	31.84	225
0913	5.55	226.1	11.6	5.11	13.8	208.6	32.19	300
0918	5.38	224.9	7.9	4.55	13.8	213.7	31.82	300
0923	5.35	224.3	5.2	4.35	13.8	223.2	31.81	300
0928	5.33	224.6	5.4	4.27	13.8	229.9	32.37	300
0930	— SAMPLED —							
0958	5.76	231.3	4.3	3.86	13.9	239.2	31.89	300

Purge Cycle (End): 23/7 sec @ 25 psi
Flow Rate (ml/min End): 300
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.3
Total Purge Volume (Gallons): ~2.5
Purge Water Management: On-Site Containment
Purge Observations (color, odor, turbidity, sheen): Clear Grab Sample
0902 Purge Start
Sample Time: 0930 MW11 & Duplicate
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~ Hg, TDS, sulfate, chloride, fluoride, radium 226/228 (Also B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl)

Other Observations / Equipment Operation Problems:
Sampled Duplicate @ MW-11

Sampler Signature: [signature] Date: 1-29-13
QA/QC Signature: [signature] Date: 2/2/13

Golder Associates

MICROPURGE SAMPLING LOG

Date: 1/30/18
Weather: windy sun 30s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ 1789754.100
Event: North Pond CCR/ASWMR GW
Sampler(s): C. Joyner
Well ID: MW-24
Field Calibration Completed: 0935 1/30/18
Well Diameter: 2 inches
Initial Depth to Water: 69.42 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI PRO DSS
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1255	6.90	654	4.5	0.88	12.9	-103.1	70.34	200
1300	7.08	665	2.4	0.81	12.6	-126.6	73.71	200
1305	7.23	657	3.8	0.73	12.9	-141.1	74.48	200
1310	7.36	646	3.4	0.64	12.3	-152.7	74.82	200
1315	7.44	624	5.6	0.64	12.6	-158.5	75.15	200
1320	7.48	608	10.1	0.59	12.7	-161.1	75.45	200
1325	7.50	601	4.5	0.59	12.7	-163.7	75.84	200
1330	7.51	581	4.6	0.55	12.0	-163.4	76.10	200
1335	7.52	567	5.5	0.53	12.4	-162.2	76.32	200
1340	7.53	549	6.9	0.52	12.4	-162.2	76.51	200
1345	7.53	545	9.3	0.50	12.7	-162.4	76.52	200
1350	7.52	537	5.5	0.52	12.7	-163.3	76.71	200
1352	SAMPLED							
1412	7.58	498.5	3.0	0.84	11.5	-147.3	77.23	200

Purge Cycle (End): 48 Sec/12 Sec @ 65 psi
Flow Rate (ml/min End): 200

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.90

Total Purge Volume (Gallons): ~4.0
Purge Water Management: Onsite containment

Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge start 1235 small black suspended particles in sample

Sample Time: 1352
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~, Hg, TDS, sulfate, chloride, fluoride, radium 226/228
  B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl

Other Observations / Equipment Operation Problems:
DTP = 150.12

Sampler Signature: [signature]
Date: 1/30/18
Page 1 of 1

QA/QC Signature: [signature]
Date: 1/31/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1-29-18
Weather: Rain, 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ 1789754.100
Event: North Ash Pond CCR Sampling
Sampler(s): P. Trout
Well ID: MW-27D
Field Calibration Completed: 0745 on 1/29/18
Well Diameter: 2 inches
Initial Depth to Water: 35.25 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProDSS ICeM103 (53)
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [x] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1225	6.68	1681	1.8	0.96	13.5	5.2	45.89	200
1230	6.67	1679	1.7	1.03	13.2	3.4	45.91	200
1235	6.65	1674	1.7	1.63	11.6	10.0	46.45	100
1240	6.63	1681	1.7	1.68	12.2	13.4	47.03	"
1243	— SAMPLED							
1320	6.64	1681	2.5	2.20	10.0	28.4	53.21	100

Purge Cycle (End): 49/16 sec @ 100 psi
Flow Rate (ml/min End): 100
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.2
Total Purge Volume (Gallons): ~2.5
Purge Water Management: On-Site Containment
Purge Observations (color, odor, turbidity, sheen): Clear Grab Sample
Purge Start @ 1202

Sample Time: 1243
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~ PAL B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl, Hg, TDS, sulfate, chloride, fluoride, radium 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 1-29-18
QA/QC Signature: _____ Date: 2/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1/29/18
Weather: Min. 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ 17 89754.100
Event: North Pond CCR ~~ASWMR~~ GW
Sampler(s): C. Joyner
Well ID: MW-295
Field Calibration Completed: 0745 1/29/18
Well Diameter: 2 inches
Initial Depth to Water: 43.38 feet
Depth to Bottom: _____ feet
Water Column Thickness: _____ feet

Equipment Used:
- [x] ~~WL Indicator~~
- [x] ~~YSI~~ ~~PRO DSS 15~~
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] In-Situ _____
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-10 Controller Box
- [x] ~~Dedicated Bladder Pump~~
- [ ] Non-dedicated BP
- [x] ~~MP-15 Controller Box~~
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1208	5.96	278.4	5.5	5.12	12.0	65.1	43.72	200
1213	5.95	263.4	8.2	4.63	11.9	75.7	43.76	200
1218	5.96	257.9	6.5	4.35	12.0	84.5	43.85	200
1223	5.97	258.9	5.0	4.23	11.8	92.2	43.91	200
1225	SAMPLED							
1251	5.97	249.4	4.8	4.02	11.5	110.2	43.75	200

Purge Cycle (End): 51sec/9sec @ 45 psi
Flow Rate (ml/min End): 200
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): 20.37
Total Purge Volume (Gallons): ~15
Purge Water Management: on site containment
Purge Observations (color, odor, turbidity, sheen): purge start 1150
DTP = 66.03'
clear grab sample
Sample Time: 1225
Field Filtered (0.45um): [ ] Yes [x] ~~No~~

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B Beryllium, Cadmium, Chromium Total, Cobalt, Lead, Barium, Calcium, Antimony, Arsenic, Barium, Lithium
- [x] Other: ~~6020 metals~~ US, Hg, TDS, sulfate, chloride, fluoride, radium 226/228 Molybdenum, Selenium, Thallium

Other Observations / Equipment Operation Problems:

Sampler Signature: Catelyn Joyner Date: 1/29/18 Page 1 of 1
QA/QC Signature: _____ Date: 1/31/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1/29/18
Weather: rain 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ 1789754.100 CJ
Event: North Pond UR ~~Historic~~ GW
Sampler(s): C. Joyner
Well ID: MW-29D
Field Calibration Completed: 0745 1/29/18
Well Diameter: 2 inches
Initial Depth to Water: 44.85 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [X] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [X] YSI PROPSS S/N: 15J105BUL
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ _____
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
0956	7.08	1044	53.9	1.83	11.0	-119.8	45.31	150
1001	7.12	1042	77.0	2.37	11.0	-119.0	45.16	150
1006	7.12	1044	34.8	2.31	11.1	-120.1	48.60	125
1011	7.11	1011	79.9	3.13	11.4	-112.6	50.56	125
1016	7.03	968	26.8	3.22	11.5	-115.9	52.31	125
1021	7.02	958	10.1	3.31	11.3	-113.7	53.21	125
1026	7.00	942	59.4	3.49	11.3	-113.0	55.03	125
1031	6.90	913	49.0	3.27	11.1	-110.2	55.79	125
1036	6.80	883	7.5	3.34	10.8	-106.2	56.62	125
1041	6.80	874	8.7	3.34	10.9	-105.1	56.93	125
1046	6.80	868	8.4	4.77	10.6	-100.9	57.33	125
1048	SAMPLED							
1128	6.81	858	12.3	4.77	8.6	-133.6	63.25	125

Purge Cycle (End): 50 sec/10psi @ 45 psi
Flow Rate (ml/min End): 125
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.96
Total Purge Volume (Gallons): ~2.0
Purge Water Management: On site containment
Purge Observations (color, odor, turbidity, sheen): purge begin 0931 clear grab sample
DTP = 161.3' rotten egg odor
Sample Time: 1048
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [ ] Other: ~~6020 metals~~ Hg, TDS, sulfate, chloride, fluoride, radium 226/228

Beryllium, Cadmium, Chromium Total, Cobalt, Copper, Boron, Calcium, Antimony, Arsenic, Barium, Lithium, Molybdenum, Selenium, Thallium

Other Observations / Equipment Operation Problems:
fluctuations in turbidity due to bubbles in flow through cell

Sampler Signature: Caitlyn Joyner Date: 1/29/18
QA/QC Signature: Date: 1/31/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1/30/18
Weather: Sun, 30s, windy

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ 1789-754.100
Event: North Ash Pond CCR Sampling
Sampler(s): P. Trout
Well ID: MW-33
Field Calibration Completed: 0935 on 1/30/18
Well Diameter: 2 inches
Initial Depth to Water: 92.41 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- ☐ WL Indicator
- ☐ YSI ProDSS KemP3 153
- ☐ In-Situ _____
- ☐ Turbidity Meter
- ☐ Peristaltic Pump
- ☐ MP-10 Controller Box
- ☒ Air Tank
- ☐ Compressor
- ☒ MP-15 Controller Box
- ☒ Dedicated Bladder Pump
- ☐ Non-dedicated BP
- ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1314	6.63	656	3.0	1.46	11.7	55.6	98.09	100
1319	6.61	642	3.3	1.64	11.2	64.5	98.99	100
1324	6.59	628	3.6	2.06	10.7	74.2	99.62	100
1329	6.57	621	3.0	2.76	2.8	81.0	99.86	100
1334	6.55	611	3.2	3.19	11.2	86.7	100.63	100
1339	6.53	605	3.3	3.06	11.8	90.1	101.25	100
~~1344~~ 1341	—	—	SAMPLED	—	—	—	—	—
1415	6.50	590	3.9	4.37	9.8	116.7	105.21	100

Purge Cycle (End): 14/16sec @ 105 psi
Flow Rate (ml/min End): 100
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.8
Total Purge Volume (Gallons): ~7.5
Purge Water Management: On-Site Containment
Purge Observations (color, odor, turbidity, sheen): Clear Grab Sample
Purge Start @ 1256
Sample Time: 1341
Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- ☐ VSWMR Table 3.1 Column A VOCs
- ☐ VSWMR Table 3.1 Column A Metals
- ☐ VSWMR Table 3.1 Column B
- ☑ Other: ~~6020 metals~~ plus Hg, TDS, sulfate, chloride, fluoride, radium 226/228
  B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 1-30-18
QA/QC Signature: _____ Date: 2/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1-29-18

Weather: Rain, 40s

Project Name: Bremo Power Station

Project No./Task No.: ~~4520347.230~~ PO5 1789-754.100

Event: North Ash Pond CCR Sampling

Sampler(s): P. Trout

Well ID: MW-34

Field Calibration Completed: 0745 on 1-29-18

Well Diameter: 2 inches

Initial Depth to Water: 92.31 feet

Depth to Bottom: — feet

Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [x] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI ProDSS 16MP3153
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ _____
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1548	6.20	392.2	2.9	0.58	13.3	78.0	92.57	275
1553	6.17	390.8	1.1	0.53	13.5	95.1	92.63	275
1558	6.16	392.4	1.7	0.53	13.0	127.1	92.61	275
1603	6.15	393.0	2.4	0.46	13.1	163.1	92.62	275
1608	6.14	390.3	1.8	0.42	13.2	198.4	92.81	275
1613	6.13	390.6	2.0	0.42	13.2	215.0	92.80	275
1615	— SAMPLED							
1636	6.12	392.4	2.7	0.48	13.0	300.4	92.74	275

Purge Cycle (End): 52/8 scc @ 90 psi

Flow Rate (ml/min End): 275

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.0

Total Purge Volume (Gallons): ~2.5

Purge Water Management: On-Site Containment

Purge Observations (color, odor, turbidity, sheen): Clear Grab Sample

Purge Started 1534

Sample Time: 1615

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~ PIC B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Pb, Li, Mo, Se, Tl, Hg, TDS, sulfate, chloride, fluoride, radium 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 1-29-18

QA/QC Signature: _____ Date: 2/2/18

Page 1 of 1

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1-29-18
Weather: Rain, 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ PLS 1739754.100
Event: North Ash Pond Leak Sampling
Sampler(s): P. Trout
Well ID: MW-35
Field Calibration Completed: 0745 on 1-29-18
Well Diameter: 2 inches
Initial Depth to Water: 106.79 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ProPlus 16M103 153
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [x] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1416	6.95	510	26.0	2.96	12.2	1.4	107.66	~~250~~ 150
1421	7.02	512	39.1	1.69	13.1	-63.4	107.68	250
1426	7.18	509	24.0	1.08	13.2	-108.0	107.71	250
1431	7.24	506	13.3	1.00	15.0	-126.7	107.73	250
1436	7.23	496.8	9.3	0.71	13.2	-129.3	107.81	250
1441	7.21	495.9	9.1	0.75	13.4	-127.9	107.89	250
1445	— SAMPLED							
1510	7.19	484.2	7.1	0.52	13.6	-121.4	108.02	250

Purge Cycle (End): 45/15 sec @ 70 psi
Flow Rate (ml/min End): 250
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.8
Total Purge Volume (Gallons): ~2.5
Purge Water Management: On-Site Containment
Purge Observations (color, odor, turbidity, sheen): Clear Grab Samples
Purge Start @ 1404
Sample Time: 1445
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~ PLS, Hg, TDS, sulfate, chloride, fluoride, radium 226/228 ~~B, Cd, Sb, As, Ba, Be, Fe~~ PLS, Cd, Cr, Co, Pb, Li, Mo, Se, Tl

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 1-29-18
QA/QC Signature: _____ Date: 2/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 1/29/18
Weather: rain 40s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520947.230~~ 1789754.100 CJ
Event: North Pond CCR/~~+SWMR~~ GW PLA
Sampler(s): L. Joyner
Well ID: Equipment Blank
Field Calibration Completed: —
Well Diameter: 2 inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI _____
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1630	SAMPLED							

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): —
Purge Water Management: —
Purge Observations (color, odor, turbidity, sheen): Equipment blank taken with 1L provided DI water poured over the water level indicator.
Sample Time: 1630
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: ~~6020 metals~~, Hg, TDS, sulfate, chloride, fluoride, radium 226/228

Beryllium, Cadmium, Cobalt, Chromium total, Lead, Boron, Calcium, Antimony, Arsenic, Barium, Lithium, Molybdenum, Selenium, Thallium

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 1/29/18 Page 1 of 1
QA/QC Signature: [signature] Date: 1/31/18

GOLDER

MICROPURGE SAMPLING LOG

Date: 1/30/18

Weather: windy 6m 30s

Project Name: Brems Power Station

Project No./Task No.: 1784754.100

Event: North Pond CCR HV SWMR GW

Sampler(s): P Trout

Well ID: Field Blank PW

Field Calibration Completed: —

Well Diameter: — inches

Initial Depth to Water: — feet

Depth to Bottom: — feet

Water Column Thickness: — feet

Equipment Used: ☐ WL Indicator ☐ Turbidity Meter ☐ Air Tank ☐ Dedicated Bladder Pump

☐ YSI _____ ☐ Peristaltic Pump ☐ Compressor ☐ Non-dedicated BP

☐ In-Situ _____ ☐ MP-10 Controller Box ☐ MP-15 Controller Box ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1430	SAMPLED							

Purge Cycle (End): — @ — psi Flow Rate (ml/min End): —

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —

Total Purge Volume (Gallons): — Purge Water Management: Onsite containment

Purge Observations (color, odor, turbidity, sheen): Field blank sampled near MW-33 with lab supplied DI water

Sample Time: 1430 Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):

☐ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals

☐ VSWMR Table 3.1 Column B Radium 226/228 B, Ca, Sb, As, Ba, Be, Cd, Co, Pb, Li, Mo, Se, Tl

☒ Other: TDS, 300.0 Anions, ~~Metals by 6010~~, Mercury by 7470,

Other Observations / Equipment Operation Problems: construction traffic nearby; very windy

Sampler Signature: Caitlyn Joyner Date: 1/30/18 Page 1 of 1

QA/QC Signature: [signature] Date: 1/31/18

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

March 20, 2018

Mike Williams
Golder Associates
2108 W Laburnum Ave
Suite 200
Richmond, VA 23227

RE: Project: Bremo North Pond CCR
Pace Project No.: 92371409

Dear Mike Williams:
Enclosed are the analytical results for sample(s) received by the laboratory on January 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This report was revised on March 1, 2018 to rerun Pace samples 001-006 by 6020.

This revision was issued on 3/12/18 to include reanalysis results for several samples, per client request.

This report was further revised on March 12, 2018 to add As, Co, Li, and Tl to the analyte list for sample -001.

This revision was issued on 3/20/1/ to correctly report the collection dates for samples MW-24 - Rerun and MW-33 - Rerun.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
(704)875-9092
Project Manager

Enclosures

cc: Craig LaCosse, Golder Associates Inc.
Rachel Powell, Golder Associates
Amanda Reynolds, Golder Associates
Martha Smith, Golder Associates Inc.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
L-A-B DOD-ELAP Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification
Connecticut Certification #: PH-0694
Delaware Certification
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: 90133
Louisiana DHH/TNI Certification #: LA140008
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: PA00091
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification
Missouri Certification #: 235
Montana Certification #: Cert 0082
Nebraska Certification #: NE-05-29-14
Nevada Certification #: PA014572015-1
New Hampshire/TNI Certification #: 2976
New Jersey/TNI Certification #: PA 051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Oregon/TNI Certification #: PA200002
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Pennsylvania Certification IDs

Tennessee Certification #: TN2867
Texas/TNI Certification #: T104704188-14-8
Utah/TNI Certification #: PA014572015-5
USDA Soil Permit #: P330-14-00213
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 460198
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Certification
Wyoming Certification #: 8TMS-L

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92371409001	**MW-11**	Water	01/29/18 09:30	01/30/18 16:30
92371409002	**MW-29S**	Water	01/29/18 12:25	01/30/18 16:30
92371409003	**MW-29D**	Water	01/29/18 10:48	01/30/18 16:30
92371409004	**MW-24**	Water	01/30/18 13:52	01/30/18 16:30
92371409005	**MW-27D**	Water	01/29/18 12:43	01/30/18 16:30
92371409006	**MW-33**	Water	01/30/18 13:41	01/30/18 16:30
92371409007	**MW-34**	Water	01/29/18 16:15	01/30/18 16:30
92371409008	**MW-35**	Water	01/29/18 14:45	01/30/18 16:30
92371409009	**Field Blank**	Water	01/30/18 14:30	01/30/18 16:30
92371409010	**Equipment Blank**	Water	01/29/18 16:30	01/30/18 16:30
92371409011	**Duplicate**	Water	01/29/18 09:30	01/30/18 16:30
92371409012	**MW-11 - Rerun**	Water	01/29/18 09:30	01/30/18 16:30
92371409013	**MW-29S - Rerun**	Water	01/29/18 12:25	01/30/18 16:30
92371409014	**MW-29D - Rerun**	Water	01/29/18 10:48	01/30/18 16:30
92371409015	**MW-24 - Rerun**	Water	01/30/18 13:52	01/30/18 16:30
92371409016	**MW-33 - Rerun**	Water	01/30/18 13:41	01/30/18 16:30
92371409017	**Equipment Blank - Rerun**	Water	01/29/18 16:30	01/30/18 16:30

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92371409001	**MW-11**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409002	**MW-29S**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409003	**MW-29D**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409004	**MW-24**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409005	**MW-27D**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409006	**MW-33**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409007	**MW-34**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409008	**MW-35**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409009	**Field Blank**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409010	**Equipment Blank**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409011	**Duplicate**	EPA 6010	SH1	7	PASI-A
		EPA 6020	TT3	5	PASI-M
		EPA 7470	SER	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 300.0	CDC	1	PASI-A
92371409012	**MW-11 - Rerun**	EPA 6020	RJS	1	PASI-M
92371409013	**MW-29S - Rerun**	EPA 6020	RJS	1	PASI-M
92371409014	**MW-29D - Rerun**	EPA 6020	RJS	1	PASI-M
92371409015	**MW-24 - Rerun**	EPA 6020	RJS	1	PASI-M
92371409016	**MW-33 - Rerun**	EPA 6020	RJS	1	PASI-M
92371409017	**Equipment Blank - Rerun**	EPA 6020	RJS	1	PASI-M

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92371409001	**MW-11**					
EPA 6010	Barium	3.5J	ug/L	5.0	02/06/18 21:08	
EPA 6020	Cobalt	0.62	ug/L	0.50	02/05/18 20:32	
EPA 6020	Lead	0.032J	ug/L	0.10	02/05/18 20:32	
EPA 6020	Lithium	0.43J	ug/L	0.50	02/05/18 20:32	
EPA 903.1	Radium-226	0.415 ± 0.452 (0.711) C:NA T:89%	pCi/L		02/13/18 17:21	
EPA 904.0	Radium-228	0.0619 ± 0.320 (0.734) C:80% T:80%	pCi/L		02/09/18 14:52	
Total Radium Calculation	Total Radium	0.477 ± 0.772 (1.45)	pCi/L		02/14/18 13:59	
92371409002	**MW-29S**					
EPA 6010	Barium	35.6	ug/L	5.0	02/06/18 21:12	
EPA 6020	Cobalt	1.2	ug/L	0.50	02/05/18 19:48	
EPA 6020	Lead	0.045J	ug/L	0.10	02/05/18 19:48	
EPA 6020	Lithium	0.75	ug/L	0.50	02/05/18 19:48	
EPA 903.1	Radium-226	0.000 ± 0.392 (0.813) C:NA T:88%	pCi/L		02/13/18 17:21	
EPA 904.0	Radium-228	1.01 ± 0.509 (0.900) C:79% T:76%	pCi/L		02/09/18 14:53	
Total Radium Calculation	Total Radium	1.01 ± 0.901 (1.71)	pCi/L		02/14/18 13:59	
92371409003	**MW-29D**					
EPA 6010	Barium	33.1	ug/L	5.0	02/06/18 21:15	
EPA 6020	Arsenic	4.3	ug/L	0.50	02/05/18 19:50	
EPA 6020	Cobalt	0.55	ug/L	0.50	02/05/18 19:50	
EPA 6020	Lead	0.38	ug/L	0.10	02/05/18 19:50	
EPA 6020	Lithium	2.7	ug/L	0.50	02/05/18 19:50	
EPA 903.1	Radium-226	0.0624 ± 0.474 (0.937) C:NA T:84%	pCi/L		02/13/18 17:21	
EPA 904.0	Radium-228	0.573 ± 0.502 (1.01) C:73% T:65%	pCi/L		02/09/18 14:53	
Total Radium Calculation	Total Radium	0.635 ± 0.976 (1.95)	pCi/L		02/14/18 13:59	
EPA 300.0	Fluoride	0.11	mg/L	0.10	02/05/18 19:17	

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92371409004	**MW-24**					
EPA 6010	Barium	49.7	ug/L	5.0	02/06/18 21:18	
EPA 6010	Molybdenum	27.9	ug/L	5.0	02/06/18 21:18	
EPA 6020	Arsenic	0.94	ug/L	0.50	02/05/18 19:53	
EPA 6020	Cobalt	1.3	ug/L	0.50	02/05/18 19:53	
EPA 6020	Lead	0.046J	ug/L	0.10	02/05/18 19:53	
EPA 6020	Lithium	1.9	ug/L	0.50	02/05/18 19:53	
EPA 903.1	Radium-226	0.000 ± 0.327 (0.709) C:NA T:93%	pCi/L		02/13/18 17:21	
EPA 904.0	Radium-228	0.640 ± 0.404 (0.759) C:76% T:83%	pCi/L		02/09/18 14:53	
Total Radium Calculation	Total Radium	0.640 ± 0.731 (1.47)	pCi/L		02/14/18 13:59	
92371409005	**MW-27D**					
EPA 6010	Barium	49.0	ug/L	5.0	02/06/18 21:21	
EPA 6010	Molybdenum	28.7	ug/L	5.0	02/06/18 21:21	
EPA 6020	Cobalt	0.40J	ug/L	0.50	02/05/18 19:56	
EPA 6020	Lithium	68.0	ug/L	0.50	02/05/18 19:56	
EPA 903.1	Radium-226	-0.061 ± 0.357 (0.796) C:NA T:86%	pCi/L		02/13/18 17:21	
EPA 904.0	Radium-228	0.779 ± 0.383 (0.632) C:71% T:83%	pCi/L		02/09/18 14:53	
Total Radium Calculation	Total Radium	0.779 ± 0.740 (1.43)	pCi/L		02/14/18 13:59	
EPA 300.0	Fluoride	0.15	mg/L	0.10	02/05/18 19:50	
92371409006	**MW-33**					
EPA 6010	Barium	22.1	ug/L	5.0	02/06/18 21:24	
EPA 6010	Molybdenum	5.2	ug/L	5.0	02/06/18 21:24	
EPA 6020	Arsenic	0.46J	ug/L	0.50	02/05/18 20:15	
EPA 6020	Lead	0.11	ug/L	0.10	02/05/18 20:15	
EPA 6020	Lithium	4.3	ug/L	0.50	02/05/18 20:15	
EPA 903.1	Radium-226	0.870 ± 0.609 (0.804) C:NA T:89%	pCi/L		02/13/18 17:22	
EPA 904.0	Radium-228	0.802 ± 0.410 (0.697) C:75% T:78%	pCi/L		02/09/18 14:54	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92371409006	**MW-33**					
Total Radium Calculation	Total Radium	1.67 ± 1.02 (1.50)	pCi/L		02/14/18 13:59	
EPA 300.0	Fluoride	0.062J	mg/L	0.10	02/05/18 20:06	
92371409007	**MW-34**					
EPA 6010	Barium	42.8	ug/L	5.0	02/06/18 21:27	
EPA 6020	Lithium	7.7	ug/L	0.50	02/05/18 20:18	
EPA 7470	Mercury	0.27	ug/L	0.20	02/14/18 16:15	
EPA 903.1	Radium-226	0.367 ± 0.538 (0.919) C:NA T:89%	pCi/L		02/13/18 17:36	
EPA 904.0	Radium-228	0.585 ± 0.428 (0.832) C:73% T:80%	pCi/L		02/09/18 14:54	
Total Radium Calculation	Total Radium	0.952 ± 0.966 (1.75)	pCi/L		02/15/18 14:51	
EPA 300.0	Fluoride	0.055J	mg/L	0.10	02/05/18 20:22	M1
92371409008	**MW-35**					
EPA 6010	Barium	105	ug/L	5.0	02/06/18 21:30	
EPA 6010	Molybdenum	2.7J	ug/L	5.0	02/06/18 21:30	
EPA 6020	Arsenic	1.9	ug/L	0.50	02/05/18 20:21	
EPA 6020	Cobalt	0.25J	ug/L	0.50	02/05/18 20:21	
EPA 6020	Lithium	35.7	ug/L	0.50	02/05/18 20:21	
EPA 903.1	Radium-226	0.807 ± 0.625 (0.882) C:NA T:82%	pCi/L		02/13/18 17:36	
EPA 904.0	Radium-228	0.958 ± 0.441 (0.704) C:71% T:78%	pCi/L		02/09/18 14:54	
Total Radium Calculation	Total Radium	1.77 ± 1.07 (1.59)	pCi/L		02/15/18 14:51	
92371409009	**Field Blank**					
EPA 903.1	Radium-226	0.114 ± 0.352 (0.682) C:NA T:92%	pCi/L		02/13/18 17:36	
EPA 904.0	Radium-228	0.211 ± 0.387 (0.848) C:75% T:75%	pCi/L		02/09/18 14:54	
Total Radium Calculation	Total Radium	0.325 ± 0.739 (1.53)	pCi/L		02/15/18 14:51	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92371409010	**Equipment Blank**					
EPA 6020	Lead	0.054J	ug/L	0.10	02/05/18 20:27	
EPA 903.1	Radium-226	0.273 ± 0.387 (0.656) C:NA T:98%	pCi/L		02/14/18 19:40	
EPA 904.0	Radium-228	0.112 ± 0.382 (0.861) C:69% T:82%	pCi/L		02/09/18 14:14	
Total Radium Calculation	Total Radium	0.385 ± 0.769 (1.52)	pCi/L		02/15/18 14:51	
92371409011	**Duplicate**					
EPA 6010	Barium	3.4J	ug/L	5.0	02/06/18 21:52	
EPA 6020	Cobalt	0.50J	ug/L	0.50	02/05/18 20:29	
EPA 6020	Lithium	0.42J	ug/L	0.50	02/05/18 20:29	
EPA 903.1	Radium-226	0.716 ± 0.433 (0.475) C:NA T:101%	pCi/L		02/14/18 19:40	
EPA 904.0	Radium-228	-0.257 ± 0.350 (0.850) C:78% T:87%	pCi/L		02/09/18 14:14	
Total Radium Calculation	Total Radium	0.716 ± 0.783 (1.33)	pCi/L		02/15/18 14:51	
92371409012	**MW-11 - Rerun**					
EPA 6020	Lead	0.036J	ug/L	0.10	02/27/18 14:39	
92371409013	**MW-29S - Rerun**					
EPA 6020	Lead	0.049J	ug/L	0.10	02/27/18 14:43	
92371409014	**MW-29D - Rerun**					
EPA 6020	Lead	0.35	ug/L	0.10	02/27/18 14:48	
92371409015	**MW-24 - Rerun**					
EPA 6020	Lead	0.040J	ug/L	0.10	02/27/18 14:52	
92371409016	**MW-33 - Rerun**					
EPA 6020	Lead	0.094J	ug/L	0.10	02/27/18 14:57	
92371409017	**Equipment Blank - Rerun**					
EPA 6020	Lead	0.036J	ug/L	0.10	02/27/18 15:01	

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Date: March 20, 2018

MW-11 - Rerun (Lab ID: 92371409012)
- Report results for 92371409001

MW-29S - Rerun (Lab ID: 92371409013)
- Report results for 92371409002

MW-29D - Rerun (Lab ID: 92371409014)
- Report results for 92371409003

MW-24 - Rerun (Lab ID: 92371409015)
- Report results for 92371409004

MW-33 - Rerun (Lab ID: 92371409016)
- Report results for 92371409006

Equipment Blank - Rerun (Lab ID: 92371409017)
- Report results for 92371409010

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 6010**
Description: 6010 MET ICP
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for EPA 6010. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3010A with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 6020**
Description: 6020 MET ICPMS
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
17 samples were analyzed for EPA 6020. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 3020 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Internal Standards:
All internal standards were within QC limits with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

Pace Analytical Services, LLC
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(704)875-9092

PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 7470**
Description: 7470 Mercury
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for EPA 7470. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Sample Preparation:
The samples were prepared in accordance with EPA 7470 with any exceptions noted below.

Initial Calibrations (including MS Tune as applicable):
All criteria were within method requirements with any exceptions noted below.

Continuing Calibration:
All criteria were within method requirements with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 903.1**
Description: 903.1 Radium 226
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 904.0**
Description: 904.0 Radium 228
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **Total Radium Calculation**
Description: Total Radium 228+226
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for Total Radium Calculation. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

Additional Comments:

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PROJECT NARRATIVE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Method: **EPA 300.0**
Description: 300.0 IC Anions 28 Days
Client: Golder Associates, Inc.
Date: March 20, 2018

General Information:
11 samples were analyzed for EPA 300.0. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

Hold Time:
The samples were analyzed within the method required hold times with any exceptions noted below.

Method Blank:
All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

Laboratory Control Spike:
All laboratory control spike compounds were within QC limits with any exceptions noted below.

Matrix Spikes:
All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 396708

A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92371406001,92371409007

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MSD (Lab ID: 2199642)
  - Fluoride

Additional Comments:

This data package has been reviewed for quality and completeness and is approved for release.

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-11 **Lab ID: 92371409001** Collected: 01/29/18 09:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:08	7440-36-0	
Barium	**3.5J**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:08	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:08	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:08	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:08	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:08	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:08	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:32	7440-38-2	
Cobalt	**0.62**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:32	7440-48-4	
Lead	**0.032J**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:32	7439-92-1	
Lithium	**0.43J**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:32	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:32	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 15:56	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 17:56	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29S **Lab ID: 92371409002** Collected: 01/29/18 12:25 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:12	7440-36-0	
Barium	**35.6**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:12	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:12	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:12	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:12	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:12	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:12	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 19:48	7440-38-2	
Cobalt	**1.2**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 19:48	7440-48-4	
Lead	**0.045J**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:48	7439-92-1	
Lithium	**0.75**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 19:48	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:48	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 15:58	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 19:01	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29D **Lab ID: 92371409003** Collected: 01/29/18 10:48 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:15	7440-36-0	
Barium	**33.1**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:15	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:15	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:15	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:15	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:15	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:15	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	**4.3**	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 19:50	7440-38-2	
Cobalt	**0.55**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 19:50	7440-48-4	
Lead	**0.38**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:50	7439-92-1	
Lithium	**2.7**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 19:50	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:50	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:01	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.11**	mg/L	0.10	0.050	1		02/05/18 19:17	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-24 **Lab ID: 92371409004** Collected: 01/30/18 13:52 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:18	7440-36-0	
Barium	**49.7**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:18	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:18	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:18	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:18	7440-47-3	
Molybdenum	**27.9**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:18	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:18	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	**0.94**	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 19:53	7440-38-2	
Cobalt	**1.3**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 19:53	7440-48-4	
Lead	**0.046J**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:53	7439-92-1	
Lithium	**1.9**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 19:53	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:53	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:03	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 19:33	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-27D **Lab ID: 92371409005** Collected: 01/29/18 12:43 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:21	7440-36-0	
Barium	**49.0**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:21	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:21	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:21	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:21	7440-47-3	
Molybdenum	**28.7**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:21	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:21	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 19:56	7440-38-2	
Cobalt	**0.40J**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 19:56	7440-48-4	
Lead	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:56	7439-92-1	
Lithium	**68.0**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 19:56	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 19:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:05	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.15**	mg/L	0.10	0.050	1		02/05/18 19:50	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-33 **Lab ID: 92371409006** Collected: 01/30/18 13:41 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:24	7440-36-0	
Barium	**22.1**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:24	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:24	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:24	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:24	7440-47-3	
Molybdenum	**5.2**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:24	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:24	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	**0.46J**	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:15	7440-38-2	
Cobalt	ND	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:15	7440-48-4	
Lead	**0.11**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:15	7439-92-1	
Lithium	**4.3**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:15	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:15	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:08	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.062J**	mg/L	0.10	0.050	1		02/05/18 20:06	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-34 **Lab ID: 92371409007** Collected: 01/29/18 16:15 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:27	7440-36-0	
Barium	**42.8**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:27	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:27	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:27	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:27	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:27	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:27	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:18	7440-38-2	
Cobalt	ND	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:18	7440-48-4	
Lead	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:18	7439-92-1	
Lithium	**7.7**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:18	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:18	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.27**	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:15	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	**0.055J**	mg/L	0.10	0.050	1		02/05/18 20:22	16984-48-8	M1

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-35 **Lab ID: 92371409008** Collected: 01/29/18 14:45 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:30	7440-36-0	
Barium	**105**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:30	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:30	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:30	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:30	7440-47-3	
Molybdenum	**2.7J**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:30	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:30	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	**1.9**	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:21	7440-38-2	
Cobalt	**0.25J**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:21	7440-48-4	
Lead	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:21	7439-92-1	
Lithium	**35.7**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:21	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:21	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:17	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 21:11	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Field Blank **Lab ID: 92371409009** Collected: 01/30/18 14:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:34	7440-36-0	
Barium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:34	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:34	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:34	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:34	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:34	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:34	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:24	7440-38-2	
Cobalt	ND	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:24	7440-48-4	
Lead	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:24	7439-92-1	
Lithium	ND	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:24	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:24	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:20	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 21:27	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Equipment Blank **Lab ID: 92371409010** Collected: 01/29/18 16:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:37	7440-36-0	
Barium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:37	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:37	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:37	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:37	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:37	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:37	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:27	7440-38-2	
Cobalt	ND	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:27	7440-48-4	
Lead	**0.054J**	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:27	7439-92-1	
Lithium	ND	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:27	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:27	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:22	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 22:16	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Duplicate **Lab ID: 92371409011** Collected: 01/29/18 09:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Antimony	ND	ug/L	5.0	3.9	1	02/05/18 16:10	02/06/18 21:52	7440-36-0	
Barium	**3.4J**	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:52	7440-39-3	
Beryllium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:52	7440-41-7	
Cadmium	ND	ug/L	1.0	0.50	1	02/05/18 16:10	02/06/18 21:52	7440-43-9	
Chromium	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:52	7440-47-3	
Molybdenum	ND	ug/L	5.0	2.5	1	02/05/18 16:10	02/06/18 21:52	7439-98-7	
Selenium	ND	ug/L	10.0	5.0	1	02/05/18 16:10	02/06/18 21:52	7782-49-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Arsenic	ND	ug/L	0.50	0.21	1	02/02/18 06:05	02/05/18 20:29	7440-38-2	
Cobalt	**0.50J**	ug/L	0.50	0.15	1	02/02/18 06:05	02/05/18 20:29	7440-48-4	
Lead	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:29	7439-92-1	
Lithium	**0.42J**	ug/L	0.50	0.17	1	02/02/18 06:05	02/05/18 20:29	7439-93-2	
Thallium	ND	ug/L	0.10	0.028	1	02/02/18 06:05	02/05/18 20:29	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	02/14/18 11:55	02/14/18 16:24	7439-97-6	
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Fluoride	ND	mg/L	0.10	0.050	1		02/05/18 22:33	16984-48-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-11 - Rerun **Lab ID: 92371409012** Collected: 01/29/18 09:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.036J**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 14:39	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29S - Rerun **Lab ID: 92371409013** Collected: 01/29/18 12:25 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.049J**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 14:43	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29D - Rerun **Lab ID: 92371409014** Collected: 01/29/18 10:48 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.35**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 14:48	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-24 - Rerun **Lab ID: 92371409015** Collected: 01/30/18 13:52 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.040J**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 14:52	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-33 - Rerun **Lab ID: 92371409016** Collected: 01/30/18 13:41 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.094J**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 14:57	7439-92-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Equipment Blank - Rerun **Lab ID: 92371409017** Collected: 01/29/18 16:30 Received: 01/30/18 16:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3020								
Lead	**0.036J**	ug/L	0.10	0.028	1	02/26/18 13:37	02/27/18 15:01	7439-92-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 396834 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

METHOD BLANK: 2200171 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	02/14/18 15:32	

LABORATORY CONTROL SAMPLE: 2200172

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.2	87	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2200173 2200174

Parameter	Units	92371406001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.3	91	90	75-125	0	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 396721 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

METHOD BLANK: 2199676 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.9	02/06/18 20:37	
Barium	ug/L	ND	5.0	2.5	02/06/18 20:37	
Beryllium	ug/L	ND	1.0	0.50	02/06/18 20:37	
Cadmium	ug/L	ND	1.0	0.50	02/06/18 20:37	
Chromium	ug/L	ND	5.0	2.5	02/06/18 20:37	
Molybdenum	ug/L	ND	5.0	2.5	02/06/18 20:37	
Selenium	ug/L	ND	10.0	5.0	02/06/18 20:37	

LABORATORY CONTROL SAMPLE: 2199677

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	464	93	80-120	
Barium	ug/L	500	452	90	80-120	
Beryllium	ug/L	500	449	90	80-120	
Cadmium	ug/L	500	458	92	80-120	
Chromium	ug/L	500	433	87	80-120	
Molybdenum	ug/L	500	465	93	80-120	
Selenium	ug/L	500	454	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2199678 2199679

Parameter	Units	92371406001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Antimony	ug/L	ND	500	500	487	485	97	97	75-125	0	20	
Barium	ug/L	42.8	500	500	514	511	94	94	75-125	1	20	
Beryllium	ug/L	ND	500	500	476	475	95	95	75-125	0	20	
Cadmium	ug/L	ND	500	500	479	479	96	96	75-125	0	20	
Chromium	ug/L	ND	500	500	453	454	91	91	75-125	0	20	
Molybdenum	ug/L	3.7J	500	500	486	486	97	96	75-125	0	20	
Selenium	ug/L	ND	500	500	481	483	96	96	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 520946 Analysis Method: EPA 6020
QC Batch Method: EPA 3020 Analysis Description: 6020 MET
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

METHOD BLANK: 2828612 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	0.50	0.21	02/05/18 20:13	
Cobalt	ug/L	ND	0.50	0.15	02/05/18 20:13	
Lead	ug/L	ND	0.10	0.028	02/05/18 20:13	
Lithium	ug/L	ND	0.50	0.17	02/05/18 20:13	
Thallium	ug/L	ND	0.10	0.028	02/05/18 20:13	

LABORATORY CONTROL SAMPLE: 2828613

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	100	99.7	100	80-120	
Cobalt	ug/L	100	96.5	96	80-120	
Lead	ug/L	100	100	100	80-120	
Lithium	ug/L	100	101	101	80-120	
Thallium	ug/L	100	98.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2828614 2828615

Parameter	Units	92371409001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	100	100	96.9	91.4	97	91	75-125	6	20	
Cobalt	ug/L	0.62	100	100	89.9	86.4	89	86	75-125	4	20	
Lead	ug/L	0.032J	100	100	95.0	92.1	95	92	75-125	3	20	
Lithium	ug/L	0.43J	100	100	102	96.8	102	96	75-125	6	20	
Thallium	ug/L	ND	100	100	93.0	90.1	93	90	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 524704 Analysis Method: EPA 6020
QC Batch Method: EPA 3020 Analysis Description: 6020 MET
Associated Lab Samples: 92371409012, 92371409013, 92371409014, 92371409015, 92371409016, 92371409017

METHOD BLANK: 2847877 Matrix: Water
Associated Lab Samples: 92371409012, 92371409013, 92371409014, 92371409015, 92371409016, 92371409017

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lead	ug/L	ND	0.10	0.028	02/28/18 11:31	

LABORATORY CONTROL SAMPLE & LCSD: 2847878 2847879

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Lead	ug/L	100	103	104	103	104	80-120	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 396708 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

METHOD BLANK: 2199637 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009, 92371409010, 92371409011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Fluoride	mg/L	ND	0.10	0.050	02/05/18 15:29	

LABORATORY CONTROL SAMPLE: 2199638

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Fluoride	mg/L	2.5	2.6	102	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2199639 2199640

Parameter	Units	92371406001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.090J	2.5	2.5	2.8	2.8	107	107	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2199641 2199642

Parameter	Units	92371409007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Fluoride	mg/L	0.055J	2.5	2.5	2.8	2.8	109	111	90-110	2	10	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-11 **Lab ID: 92371409001** Collected: 01/29/18 09:30 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.415 ± 0.452 (0.711) C:NA T:89%**	pCi/L	02/13/18 17:21	13982-63-3	
Radium-228	EPA 904.0	**0.0619 ± 0.320 (0.734) C:80% T:80%**	pCi/L	02/09/18 14:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.477 ± 0.772 (1.45)**	pCi/L	02/14/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29S **Lab ID: 92371409002** Collected: 01/29/18 12:25 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.392 (0.813) C:NA T:88%**	pCi/L	02/13/18 17:21	13982-63-3	
Radium-228	EPA 904.0	**1.01 ± 0.509 (0.900) C:79% T:76%**	pCi/L	02/09/18 14:53	15262-20-1	
Total Radium	Total Radium Calculation	**1.01 ± 0.901 (1.71)**	pCi/L	02/14/18 13:59	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-29D **Lab ID: 92371409003** Collected: 01/29/18 10:48 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0624 ± 0.474 (0.937) C:NA T:84%**	pCi/L	02/13/18 17:21	13982-63-3	
Radium-228	EPA 904.0	**0.573 ± 0.502 (1.01) C:73% T:65%**	pCi/L	02/09/18 14:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.635 ± 0.976 (1.95)**	pCi/L	02/14/18 13:59	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-24 **Lab ID: 92371409004** Collected: 01/30/18 13:52 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.000 ± 0.327 (0.709) C:NA T:93%**	pCi/L	02/13/18 17:21	13982-63-3	
Radium-228	EPA 904.0	**0.640 ± 0.404 (0.759) C:76% T:83%**	pCi/L	02/09/18 14:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.640 ± 0.731 (1.47)**	pCi/L	02/14/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-27D **Lab ID: 92371409005** Collected: 01/29/18 12:43 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.061 ± 0.357 (0.796) C:NA T:86%**	pCi/L	02/13/18 17:21	13982-63-3	
Radium-228	EPA 904.0	**0.779 ± 0.383 (0.632) C:71% T:83%**	pCi/L	02/09/18 14:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.779 ± 0.740 (1.43)**	pCi/L	02/14/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-33 **Lab ID: 92371409006** Collected: 01/30/18 13:41 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.870 ± 0.609 (0.804) C:NA T:89%**	pCi/L	02/13/18 17:22	13982-63-3	
Radium-228	EPA 904.0	**0.802 ± 0.410 (0.697) C:75% T:78%**	pCi/L	02/09/18 14:54	15262-20-1	
Total Radium	Total Radium Calculation	**1.67 ± 1.02 (1.50)**	pCi/L	02/14/18 13:59	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-34 **Lab ID: 92371409007** Collected: 01/29/18 16:15 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.367 ± 0.538 (0.919) C:NA T:89%**	pCi/L	02/13/18 17:36	13982-63-3	
Radium-228	EPA 904.0	**0.585 ± 0.428 (0.832) C:73% T:80%**	pCi/L	02/09/18 14:54	15262-20-1	
Total Radium	Total Radium Calculation	**0.952 ± 0.966 (1.75)**	pCi/L	02/15/18 14:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: MW-35 **Lab ID: 92371409008** Collected: 01/29/18 14:45 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.807 ± 0.625 (0.882) C:NA T:82%**	pCi/L	02/13/18 17:36	13982-63-3	
Radium-228	EPA 904.0	**0.958 ± 0.441 (0.704) C:71% T:78%**	pCi/L	02/09/18 14:54	15262-20-1	
Total Radium	Total Radium Calculation	**1.77 ± 1.07 (1.59)**	pCi/L	02/15/18 14:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Field Blank **Lab ID: 92371409009** Collected: 01/30/18 14:30 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.114 ± 0.352 (0.682) C:NA T:92%**	pCi/L	02/13/18 17:36	13982-63-3	
Radium-228	EPA 904.0	**0.211 ± 0.387 (0.848) C:75% T:75%**	pCi/L	02/09/18 14:54	15262-20-1	
Total Radium	Total Radium Calculation	**0.325 ± 0.739 (1.53)**	pCi/L	02/15/18 14:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Equipment Blank **Lab ID: 92371409010** Collected: 01/29/18 16:30 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.273 ± 0.387 (0.656) C:NA T:98%**	pCi/L	02/14/18 19:40	13982-63-3	
Radium-228	EPA 904.0	**0.112 ± 0.382 (0.861) C:69% T:82%**	pCi/L	02/09/18 14:14	15262-20-1	
Total Radium	Total Radium Calculation	**0.385 ± 0.769 (1.52)**	pCi/L	02/15/18 14:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Sample: Duplicate **Lab ID: 92371409011** Collected: 01/29/18 09:30 Received: 01/30/18 16:30 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.716 ± 0.433 (0.475) C:NA T:101%**	pCi/L	02/14/18 19:40	13982-63-3	
Radium-228	EPA 904.0	**-0.257 ± 0.350 (0.850) C:78% T:87%**	pCi/L	02/09/18 14:14	15262-20-1	
Total Radium	Total Radium Calculation	**0.716 ± 0.783 (1.33)**	pCi/L	02/15/18 14:51	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 287055 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009

METHOD BLANK: 1407544 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.386 ± 0.401 (0.597) C:NA T:84%	pCi/L	02/13/18 16:54	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 287058 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009

METHOD BLANK: 1407548 Matrix: Water
Associated Lab Samples: 92371409001, 92371409002, 92371409003, 92371409004, 92371409005, 92371409006, 92371409007, 92371409008, 92371409009

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.437 ± 0.371 (0.739) C:78% T:78%	pCi/L	02/09/18 14:54	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 287151 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92371409010, 92371409011

METHOD BLANK: 1407849 Matrix: Water
Associated Lab Samples: 92371409010, 92371409011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.057 ± 0.262 (0.617) C:NA T:92%	pCi/L	02/14/18 18:41	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92371409

QC Batch: 287059 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92371409010, 92371409011

METHOD BLANK: 1407549 Matrix: Water
Associated Lab Samples: 92371409010, 92371409011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.505 ± 0.332 (0.628) C:80% T:86%	pCi/L	02/09/18 14:14	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg

SAMPLE QUALIFIERS

Sample: 92371409012
[1] Report results for 92371409001
Sample: 92371409013
[1] Report results for 92371409002
Sample: 92371409014
[1] Report results for 92371409003

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Bremo North Pond CCR
Pace Project No.: 92371409

SAMPLE QUALIFIERS

Sample: 92371409015
[1] Report results for 92371409004
Sample: 92371409016
[1] Report results for 92371409006
Sample: 92371409017
[1] Report results for 92371409010

ANALYTE QUALIFIERS

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92371409001	**MW-11**	EPA 3010A	396721	EPA 6010	396821
92371409002	**MW-29S**	EPA 3010A	396721	EPA 6010	396821
92371409003	**MW-29D**	EPA 3010A	396721	EPA 6010	396821
92371409004	**MW-24**	EPA 3010A	396721	EPA 6010	396821
92371409005	**MW-27D**	EPA 3010A	396721	EPA 6010	396821
92371409006	**MW-33**	EPA 3010A	396721	EPA 6010	396821
92371409007	**MW-34**	EPA 3010A	396721	EPA 6010	396821
92371409008	**MW-35**	EPA 3010A	396721	EPA 6010	396821
92371409009	**Field Blank**	EPA 3010A	396721	EPA 6010	396821
92371409010	**Equipment Blank**	EPA 3010A	396721	EPA 6010	396821
92371409011	**Duplicate**	EPA 3010A	396721	EPA 6010	396821
92371409001	**MW-11**	EPA 3020	520946	EPA 6020	521076
92371409002	**MW-29S**	EPA 3020	520946	EPA 6020	521076
92371409003	**MW-29D**	EPA 3020	520946	EPA 6020	521076
92371409004	**MW-24**	EPA 3020	520946	EPA 6020	521076
92371409005	**MW-27D**	EPA 3020	520946	EPA 6020	521076
92371409006	**MW-33**	EPA 3020	520946	EPA 6020	521076
92371409007	**MW-34**	EPA 3020	520946	EPA 6020	521076
92371409008	**MW-35**	EPA 3020	520946	EPA 6020	521076
92371409009	**Field Blank**	EPA 3020	520946	EPA 6020	521076
92371409010	**Equipment Blank**	EPA 3020	520946	EPA 6020	521076
92371409011	**Duplicate**	EPA 3020	520946	EPA 6020	521076
92371409012	**MW-11 - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409013	**MW-29S - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409014	**MW-29D - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409015	**MW-24 - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409016	**MW-33 - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409017	**Equipment Blank - Rerun**	EPA 3020	524704	EPA 6020	524809
92371409001	**MW-11**	EPA 7470	396834	EPA 7470	396968
92371409002	**MW-29S**	EPA 7470	396834	EPA 7470	396968
92371409003	**MW-29D**	EPA 7470	396834	EPA 7470	396968
92371409004	**MW-24**	EPA 7470	396834	EPA 7470	396968
92371409005	**MW-27D**	EPA 7470	396834	EPA 7470	396968
92371409006	**MW-33**	EPA 7470	396834	EPA 7470	396968
92371409007	**MW-34**	EPA 7470	396834	EPA 7470	396968
92371409008	**MW-35**	EPA 7470	396834	EPA 7470	396968
92371409009	**Field Blank**	EPA 7470	396834	EPA 7470	396968
92371409010	**Equipment Blank**	EPA 7470	396834	EPA 7470	396968
92371409011	**Duplicate**	EPA 7470	396834	EPA 7470	396968
92371409001	**MW-11**	EPA 903.1	287055		
92371409002	**MW-29S**	EPA 903.1	287055		
92371409003	**MW-29D**	EPA 903.1	287055		
92371409004	**MW-24**	EPA 903.1	287055		
92371409005	**MW-27D**	EPA 903.1	287055		
92371409006	**MW-33**	EPA 903.1	287055		
92371409007	**MW-34**	EPA 903.1	287055		
92371409008	**MW-35**	EPA 903.1	287055		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo North Pond CCR
Pace Project No.: 92371409

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92371409009	**Field Blank**	EPA 903.1	287055		
92371409010	**Equipment Blank**	EPA 903.1	287151		
92371409011	**Duplicate**	EPA 903.1	287151		
92371409001	**MW-11**	EPA 904.0	287058		
92371409002	**MW-29S**	EPA 904.0	287058		
92371409003	**MW-29D**	EPA 904.0	287058		
92371409004	**MW-24**	EPA 904.0	287058		
92371409005	**MW-27D**	EPA 904.0	287058		
92371409006	**MW-33**	EPA 904.0	287058		
92371409007	**MW-34**	EPA 904.0	287058		
92371409008	**MW-35**	EPA 904.0	287058		
92371409009	**Field Blank**	EPA 904.0	287058		
92371409010	**Equipment Blank**	EPA 904.0	287059		
92371409011	**Duplicate**	EPA 904.0	287059		
92371409001	**MW-11**	Total Radium Calculation	288095		
92371409002	**MW-29S**	Total Radium Calculation	288095		
92371409003	**MW-29D**	Total Radium Calculation	288095		
92371409004	**MW-24**	Total Radium Calculation	288095		
92371409005	**MW-27D**	Total Radium Calculation	288095		
92371409006	**MW-33**	Total Radium Calculation	288095		
92371409007	**MW-34**	Total Radium Calculation	288270		
92371409008	**MW-35**	Total Radium Calculation	288270		
92371409009	**Field Blank**	Total Radium Calculation	288270		
92371409010	**Equipment Blank**	Total Radium Calculation	288270		
92371409011	**Duplicate**	Total Radium Calculation	288270		
92371409001	**MW-11**	EPA 300.0	396708		
92371409002	**MW-29S**	EPA 300.0	396708		
92371409003	**MW-29D**	EPA 300.0	396708		
92371409004	**MW-24**	EPA 300.0	396708		
92371409005	**MW-27D**	EPA 300.0	396708		
92371409006	**MW-33**	EPA 300.0	396708		
92371409007	**MW-34**	EPA 300.0	396708		
92371409008	**MW-35**	EPA 300.0	396708		
92371409009	**Field Blank**	EPA 300.0	396708		
92371409010	**Equipment Blank**	EPA 300.0	396708		
92371409011	**Duplicate**	EPA 300.0	396708		

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: January 24, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.05	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☐ Mechanicsville ☒

Sample Condition Upon Receipt

Client Name: Golder Project #

WO# : 92371409

92371409

Courier: ☐ Commercial ☐ Fed Ex ☐ Pace ☐ UPS ☐ USPS ☐ Other: ☑ Client

Custody Seal Present? ☑ Yes ☐ No Seals Intact? ☑ Yes ☐ No

Date/Initials Person Examining Contents: 1-30-18 RSB

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Thermometer: ☒ IR Gun ID: T-3 Type of Ice: ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): _____ Correction Factor: Add/Subtract (°C) 0.0

Cooler Temp Corrected (°C): 0.8

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: LTCP **Date:** 020518

Project Manager SRF Review: NMG **Date:** 2/5/18

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project # **WO# : 92371409**

PM: NMG **Due Date: 02/08/18**

CLIENT: 92-Golder

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	1 L HNO3	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	Cubitainer	VSGU-20 mL Scintillation vials (N/A)	GN
1		1	1			2 ✓																		2 ✓				
2		1	1			2 ✓																		2 ✓				
3		1	1			2 ✓																		2 ✓				
4		1	1			2 ✓																		2 ✓				
5		1	1			2 ✓																		2 ✓				
6		1	1			2 ✓																		2 ✓				
7		1	1			2 ✓																		2 ✓				
8		1	1			2 ✓																		2 ✓				
9		1	1			2 ✓																		2 ✓				
10		1	1			2 ✓																		2 ✓				
11		1	1			2 ✓																		2 ✓				
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Golder Associates, Inc.	Report To:	Mike Williams	Attention:	
Address:	2108 W Laburnum Ave	Copy To:		Company Name:	
Richmond, VA 23227				Address:	
Email:	mike_williams@golder.com	Purchase Order #:		Pace Quote:	
Phone:	(804)358-7900 Fax	Project Name:	Bremo North Pond CCR	Pace Project Manager:	nicole.gasiorowski@pacelabs.com,
Requested Due Date:	10 Day T.A.T.	Project #:	1739-754.100	Pace Profile #:	TBD

Regulatory Agency	
State / Location	VA

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	TDS	300.0 Anions	Metals by 6010	Mercury by 7470	Radium 226/228	Residual Chlorine (Y/N)	92371409	
	MATRIX: Drinking Water DW, Water WT, Waste Water WW, Product P, Soil/Solid SL, Oil OL, Wipe WP, Air AR, Other OT, Tissue TS			DATE	TIME	DATE	TIME											Y/N	N	N	N	N	N			
1	MW-11	WT	G	—	—	1/29/18	0930		6	2		4							x	x	x	x	x		All samples	001
2	MW-29S	WT	G	—	—	1/29/18	1225		6	2		4							x	x	x	x	x		preserved	002
3	MW-29D	WT	G	—	—	1/29/18	1043		6	2		4							x	x	x	x	x		with ice	003
4	MW-24	WT	G	—	—	1/30/18	1352		6	2		4							x	x	x	x	x			004
5	MW-27D	WT	G	—	—	1/29/18	1243		6	2		4							x	x	x	x	x			005
6	MW-33	WT	G	—	—	1/30/18	1341		6	2		4							x	x	x	x	x			006
7	MW-34	WT	G	—	—	1/29/18	1615		6	2		4							x	x	x	x	x			007
8	MW-35	WT	G	—	—	1/29/18	1445		6	2		4							x	x	x	x	x			008
9	Field Blank	WT	G	—	—	1/30/18	1430		6	2		4							x	x	x	x	x			009
10	Equipment Blank	WT	G	—	—	1/29/18	1630		6	2		4							x	x	x	x	x			010
11	Duplicate	WT	G	—	—	1/29/18	0930		6	2		4							x	x	x	x	x			011
12		WT																	x	x	x	x	x			

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
Level II Data Package	Golder	1/30/18	1630	Rachel Burruss	1-30-18	1630	0.8	Y	Y	Y

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER:	Patrick Trost / Catelyn Joyner	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
SIGNATURE of SAMPLER:	DATE Signed: 1/30/18				

Project Name: Bremo Power Station

Project Reference Number: 178975418.100A

Sampling Event Date: January 29-30, 2018

Review Date: 03/12/2018 *Initials:* ALR

Review Date: 04/03/2018 *Initials:* MGW

Person(s) performing the review are to initial each item on this form as acknowledgement of data acceptance, or as acknowledgement of a review issue. In the case of the latter, a brief explanation should follow the applicable item.

Golder Associates Inc. has reviewed the laboratory certificates of analysis, chain-of-custody form, and laboratory provided sample group quality assurance and quality control data for the above referenced sample group to identify potential bias or inaccuracy, in general accordance with the following United States Environmental Protection Agency (EPA) and Department of Energy (DOE) documents:

- National Functional Guidelines for Organic Superfund Methods Data Review, January 2017;
- National Functional Guidelines for Inorganic Superfund Methods Data Review, January 2017;
- US Department of Energy Evaluation of Radiochemical Data Usability, April 1997; and
- Sampling and Analysis Plan for US Department of Energy Office of Legacy Management Sites.

COMMON ACRONYMS:

- MS = matrix spike
- MSD = matrix spike duplicate
- LCS = laboratory control spike
- RPD = relative percent difference
- MB = method blank
- DUP = duplicate
- FB = field blank
- VSWMR = Virginia Solid Waste Management Regulations
- J = estimated
- ND and/or U= not detected
- COC = chain of custody
- QC = quality control
- µg/L = micrograms per liter
- mg/L = milligrams per liter
- EPA = United States Environmental Protection Agency
- pCi/L = picocuries per liter

COMPLIANCE ANALYTE LIST

☐ Historical VPDES Parameters

☐ CCR Appendix III to Part 257

☒ CCR Appendix IV to Part 257

☐ VSWMR Phase II Parameters: _____

☐ Other: _____

Note: Pace Project No: 92371409

Golder
2108 West Laburnum Ave., Suite 200
Richmond, Virginia, USA 23227
T: +1 804 358-7900 | F: +1 804 358-2900

1.0 CHAIN OF CUSTODY (COC) REVIEW

Yes COC was properly signed by all parties.

Yes Correct project name and number are on the form.

Yes Sample receipt condition at laboratory was acceptable.

Yes Each sample and blank submitted for analysis appears in the data report.

Note: _____

2.0 SAMPLE HOLDING TIMES

Yes Holding times for extraction *and/or* analysis were met for each analytical method.

Review Criteria		
Method	**Analytes**	**Holding Time**
EPA 9056A	Chloride, fluoride, and sulfate	28 days
EPA 903.1 EPA 904.0	Radium 226 Radium 228	6 months
EPA 6000 series	Metals, except mercury	6 months
EPA 7470	Mercury	28 days
SM 2540C	TDS	7 days
SM 2320B	Alkalinity	14 days
SM 4500S2D	Sulfide	28 days
SM 5310B	TOC	28 days
EPA 7196A	Hexavalent Chromium	24 hours
EPA 9012	Cyanide	14 days

Notes:_____

3.0 LABORATORY QUALITY CONTROL REVIEW

Yes Laboratory analyzed at least one internal blank for each method, where applicable.

Yes Laboratory blanks were interference free.

Notes: The following table presents method blank detections and their associated sample delivery groups (SDG; batch). In accordance with EPA guidance, associated samples within the same batch have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank

concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification is not recommended.

For radiochemistry data, if the reported absolute value of the method blank is above the minimum detectable concentration (MDC) and no other deficiencies are noted in the associated dataset, detections above the MDC and less than 5 times the concentration reported in the method blank may be blank qualified "J" in accordance with qualification guidance. As presented below, data qualification is not required.

Parameter	Method Blank Detection (µg/L)	Batch	Associated Qualified Sample(s)	Validator Qualifier
--	--	--	--	--

NA Surrogate recoveries are provided for each analytical method, where applicable.

NA Surrogate recoveries for each method are within the acceptable limits.

Notes: _____

Yes Tracer and carrier yields are provided for each analytical method, where applicable (Radiochemical Data Only).

Yes Tracer and carrier yields for each method are within the acceptable limits (Radiochemical Data Only).

Notes: _____

Yes MS/MSD/LCS/RPD data results are provided for each analytical method.

See Note MS/MSD/LCS/RPD recoveries for each method are within the acceptable limits.

Notes: The following table presents recoveries and relative percent differences (RPDs) that were outside of QC limits for the associated sample delivery group (analytical batch). In accordance with EPA guidance for evaluation of spike recoveries, the associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ), or unusable (R) using professional judgement to evaluate the spike recovery. Post-digestion spike recovery will be evaluated for MS/MSD qualification purposes where provided. As presented, no data qualification is recommended. No MS/MSD results were provided for radium-226 or radium-228.

In accordance with EPA guidance for evaluation of RPDs, the associated samples may be qualified estimated (J or UJ) using professional judgement to evaluate the RPD. As presented, no data qualification is recommended.

Parameter	Recovery Outside QC Limits	Batch	Associated Qualified Sample(s)	Validator Qualifier
Fluoride	MSD	396708	--	--

Yes Minimum Detectable Concentrations (MDCs) are provided for radiological samples.

Yes Radiological samples reported below their respective MDC have been qualified with a "U."

Notes: _____

Parameter	Associated Samples Below MDC
Radium-226	MW-11, MW-29S, MW-29D, MW-24, MW-27D, MW-34, MW-35, Field Blank, Equipment Blank
Radium-228	MW-11, MW-29D, MW-24, MW-34, Field Blank, Equipment Blank, Duplicate

4.0 ANALYTE LISTS/METHODS

Yes The proper number of constituents are present for each analyte list as identified above (including detects where applicable).

Yes Proper EPA SW-846 analytical methods were used for analysis.

Notes: _____

5.0 OUTLIER EVALUATION

Yes Analytical results have been evaluated for variances +/- 25% compared to the average of the most recent 8 data points.

Yes Analytical results with variances >25% have been evaluated for trends.

Yes If no trends were identified for analytical results with variances >25%, a data quality review (DQR) was conducted for suspect analytical results identified as possible outliers. DQR results summarized below.

Analyte	Location	DQR identified issues?	Re-analysis requested?	Outlier Identification
Lead	MW-11, MW-29D, MW-29S, MW-24, MW-33	High concentrations reported. No issues were noted in the associated method blank or MS/MSD. An estimated detection was reported in the Equipment Blank.	Yes	Reanalysis confirmed orginal result (< 20% RPD). Original result reported in data tabulation.

6.0 DATA REPORTING

See Note Trip; field and/or equipment; and laboratory blank results have all been reported and the detected constituents in these blanks, if any, have been qualified using professional judgement where detected in other samples.

Notes: The following table presents field blank detections and associated samples that have been qualified. In accordance with EPA guidance, associated samples have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification is recommended.

Sample ID	Parameter	Blank Detection (µg/L)	Associated Qualified Sample(s)	Validator Qualifier
Equipment Blank	Lead	0.054 J	MW-11, MW-29D, MW-29S, MW-24, MW-33	J+

Yes It is clear from the laboratory report that samples have or have not been diluted during analysis, and if the samples have been diluted, the result is reported as a multiple of the dilution (*e.g.*, a sample diluted 10x resulting in an analytical detection of 1.0 should be reported as 10).

Yes The report provides the reporting limit for each constituent.

Yes The proper reporting limits have been used (*e.g.* NC Solid Waste Section approved PQLs, or VA DEQ Permit approved detection limits, as appropriate).

Notes: _____

APPENDIX B

FIRST SEMI-ANNUAL ASSESSMENT MONITORING PROGRAM EVENT FIELD DATA SHEETS, LABORATORY CERTIFICATES OF ANALYSIS, CHAIN-OF-CUSTODY FORMS, AND DATA VALIDATION FORMS

Date: ~~5/2/~~ BE 4/30/18-05/1/18

GOLDER

WELL GAUGING LOG

Project Name: Bremo-North Pond CCR

Project No./Task No.: 1789754.100

Sampler(s): B. Euker / A. Keane

Equipment: Water Level Indicator

Well ID	Personnel (initials)	Time	DTW (feet)	DTB (feet)	Well Condition Summary: Protective Casing	Well Casing	Label	Lock	Pad Condition
MW-11	AK	1407	30.01	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
05/01/18 MW-29S	AK	1135	44.00	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
05/01/18 MW-29D	AK	1013	45.90	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-24	BE	1635	70.89	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-27D	AK	1520	36.13	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-33	BE	1415	92.56	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-34	BE	1610	102.14	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-35	BE	1630	107.33	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged

Observations/Notes:

Signature: [signature] Date: ~~5/2~~ BE 4/30/18

QA/QC Signature: [signature] Date: 5/1/2018

Page 1 of 1

MICROPURGE SAMPLING LOG

Golder Associates

Date: 4/30/18
Weather: Sunny 60's

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ AR 1789-75418.100
Event: CCR
Sampler(s): A. Keane
Well ID: MW-11
Field Calibration Completed: 1325 on 4/30/18
Well Diameter: 2 inches
Initial Depth to Water: 30.01 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [ ] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI 6020
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [x] ~~YSI~~

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1417	5.18	240	66.2	8.55	16.19	188.4	31.35	200
1422	5.11	227	8.8	7.49	15.95	189.5	31.40	200
1427	5.02	228	13.0	6.73	15.89	194.4	31.60	200
1432	4.99	227	30.9	6.52	15.88	196.5	31.65	200
1437	4.94	224	1.9	6.28	15.83	203.4	31.60	200
1440	—	—	SAMPLED	—	—	—	—	—
1505	4.96	228	3.1	6.20	17.90	209.2	31.60	200

Purge Cycle (End): 25/5sec @ 25 psi
Flow Rate (ml/min End): 200
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.3
Total Purge Volume (Gallons): ~2.5
Purge Water Management: containerized onsite
Purge Observations (color, odor, turbidity, sheen): clear grab sample
Purge Time: 1412
Sample Time: 1440
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR CCR App III & App IV: As, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 4/30/18
QA/QC Signature: [signature] Date: 5/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 5/1/18
Weather: Sunny 70's

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ AR 1789754 18.103
Event: CCR
Sampler(s): A. Keene
Well ID: OW-295
Field Calibration Completed: ~~0930~~ 0930 on 5/1/18
Well Diameter: 2 inches
Initial Depth to Water: 44.06 feet
Depth to Bottom: _____ feet
Water Column Thickness: - feet

Equipment Used:
- [x] WL Indicator
- [x] YSI ~~SN~~ 6820
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1145	5.68	261	3.6	7.11	15.84	59.4	44.15	200
1150	5.69	254	1.3	6.49	15.73	72.7	44.60	200
1155	5.72	254	2.9	6.62	15.82	77.6	44.50	200
1200	5.72	254	9.6	6.41	15.92	86.6	44.47	200
1205			SAMPLED					
1225	6.41	353	7.5	8.45	18.82	74.4	44.40	200

Purge Cycle (End): 5/0/18 sec @ 35 psi
Flow Rate (ml/min End): 200
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.5
Total Purge Volume (Gallons): ~1.5
Purge Water Management: containerized ons. H
Purge Observations (color, odor, turbidity, sheen): clear grab sample

Sample Time: 1205
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR

CCR App III & IV: Ar, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra 226-228

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 5/1/18
QA/QC Signature: _____ Date: 5/2/18

Golder Associates

MICROPURGE SAMPLING LOG

Date: 5/1/18

Weather: Sunny 60's

Project Name: Bremo Power Station

Project No./Task No.: ~~1520347.230~~ AR 1789754 18.100

Event: CCR

Sampler(s): A. Keene

Well ID: OW-29D

Field Calibration Completed: 0930 on 5/1/18

Well Diameter: 2 inches

Initial Depth to Water: 45.90 feet

Depth to Bottom: - feet

Water Column Thickness: - feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 6820
- [ ] In-Situ
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1035	6.90	938	1.3	5.09	15.36	-52.9	~~+.45~~ 52.15	150
1040	6.92	938	8.1	3.53	15.53	-60.3	53.00	150
1045	6.96	939	2.6	3.87	15.58	-65.9	54.30	150
1050	6.93	939	8.5	5.30	15.60	-68.5	55.44	150
1052			SAMPLED					
1130	6.93	925	7.0	3.44	17.91	-71.5		<100

Purge Cycle (End): 5|9 sec @ 40 psi

Flow Rate (ml/min End): <100

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.0

Total Purge Volume (Gallons): ~2.0

Purge Water Management: Containerized onsite

Purge Observations (color, odor, turbidity, sheen): clear grab sample

Purge Time: 1018

Sample Time: 1052

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR

CCR App III & IV: As, Be, Co, Fl, Pb, Li, Hg, Mo, Ra 226-228

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 5/1/18 Page 1 of 1

QA/QC Signature: [signature] Date: 5/2/18

MICROPURGE SAMPLING LOG

GOLDER

Date: 05/01/18
Weather: Sunny 70's °F

Project Name: Breno
Project No./Task No.: 1789754.100 (18)
Event: North Pond
Sampler(s): B. Euker
Well ID: MW-24
Field Calibration Completed: 0935 on 05/01/18
Well Diameter: — inches
Initial Depth to Water: ~~ft~~ 70.95 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 6920 SN: 12537
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1330	7.17	632	2.4	0.62	15.91	-137.6	75.60	200
1335	7.26	622	2.4	0.50	16.33	-147.5	76.21	200
1340	7.31	607	2.4	0.44	16.07	-153.0	76.52	200
1345	7.34	588	2.7	0.43	16.06	-156.2	76.78	200
1350	7.37	562	3.5	0.42	16.10	-159.1	77.21	200
1355	7.38	550	4.5	0.38	16.07	-158.8	77.26	200
1400	7.38	546	4.7	0.35	16.28	-158.2	77.62	200
1402	—	—	SAMPLED	—	—	—	—	—
1420	7.39	620	5.2	0.39	17.29	-151.6	78.36	200

Purge Cycle (End): 4 @ 65 psi
Flow Rate (ml/min End): 200
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.90
Total Purge Volume (Gallons): ~3.5
Purge Water Management: Onsite containment
Purge Observations (color, odor, turbidity, sheen): clear grab, no odor, no sheen
Purge @ 1300

Sample Time: 1402
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] CCR Appendix III and IV Constituents
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [ ] Other: App IV: Arsenic, Boron, Cobalt, Fluoride, Lead, Lithium, Mercury, Radium 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: Brandon Euker
Date: 05/01/18
Page 1 of 1

QA/QC Signature:
Date: 5/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 4/30/18
Weather: Sunny 60s

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ AR 1789754 18-100
Event: CCR
Sampler(s): AKeane
Well ID: MW-27D
Field Calibration Completed: 1325 on 4/30/18
Well Diameter: 2 inches
Initial Depth to Water: 36.13 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI 6820
- [ ] In-Situ
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)@C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1545	6.35	1524	9.3	10.17	15.80	34.9	48.56	200
1550	6.34	1538	1.2	12.79	15.74	32.6	51.00	200
1555	6.33	1536	9.6	10.61	15.87	33.8	53.10	200
1600	6.30	1535	0.5	7.54	15.84	38.8	55.80	200
1602			SAMPLED					
1620	6.26	1494	0.8	~~4.78~~	16.17	49.5	62.30	200

Purge Cycle (End): 45/15 @ 100 psi
Flow Rate (ml/min End): 200
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.2
Total Purge Volume (Gallons): ~3.5
Purge Water Management: Containerized onsite
Purge Observations (color, odor, turbidity, sheen): clear grab sample
Purge Time: 1525
Sample Time: 1602
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR

Other Observations / Equipment Operation Problems: CCR App III & App IV: As, Ba, Cd, Fl, Pb, Li, Hg, Mo, Ra 226-228

Sampler Signature: [signature] Date: 4/30/18
QA/QC Signature: Brandon Eike Date: 5/2/18

MICROPURGE SAMPLING LOG

GOLDER

Date: 04/30/18
Weather: Sunny 70's °F

Project Name: Bremo
Project No./Task No.: 1789754[illegible]00
Event: North Pond
Sampler(s): B. Eiker
Well ID: MW-33
Field Calibration Completed: 1325 on 04/30/18
Well Diameter: 2.0 inches
Initial Depth to Water: 92.56 feet
Depth to Bottom: — feet
Water Column Thickness: 45.8 BE feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI 6920
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1505	6.30	677	4.2	11.59	18.47	-7.4	~~95.8~~ BE 95.12	100
1510	6.32	680	3.8	11.19	18.55	3.2	95.85	100
1515	6.38	670	3.5	10.06	18.57	22.9	97.69	100
1520	6.37	640	3.3	9.40	18.62	40.6	98.20	100
1525	6.38	635	3.2	9.50	18.62	45.2	98.61	100
1530	6.36	630	3.3	9.35	18.51	50.2	99.03	100
1532 — SAMPLED —								
1620	6.61	BE ~~512~~ 608	4.4	15.58	20.92	109.6	102.81	100

Purge Cycle (End): 10/20 @ 105 psi
Flow Rate (ml/min End): 100
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.8
Total Purge Volume (Gallons): ~1.5
Purge Water Management: Onsite containment
Purge Observations (color, odor, turbidity, sheen): Clear grab sample, no odor, no sheen
Purge @ 1420

Sample Time: 1532
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] CCR Appendix III and IV Constituents
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [ ] Other: App IV: Ar, Ba, Co, Fl, Pb, Li, Hg, Mo, Rd 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: Braden E[signature]
Date: ~~04/[illegible]/18~~ 04/30/18
Page 1 of 1

QA/QC Signature: [signature]
Date: 5/2/2018

MICROPURGE SAMPLING LOG

GOLDER

Date: 05/01/18
Weather: Sunny 70's °F

Project Name: Bremo
Project No./Task No.: 1789754 18.100
Event: North Pond
Sampler(s): B. Euker
Well ID: MW-34
Field Calibration Completed: 0935 on 05/01/18
Well Diameter: 2.0 inches
Initial Depth to Water: 102.20 feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [X] WL Indicator
- [X] YSI 6920 SN: 12537
- [ ] In-Situ
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [X] MP-15 Controller Box
- [X] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1033	5.95	391	3.4	7.32	15.61	350.0	102.54	300
1038	5.99	389	3.1	5.80	15.66	340.4	102.61	300
1043	5.98	390	2.7	5.31	15.51	402.1	102.58	300
1048	5.96	387	2.5	4.94	15.69	426.9	102.51	300
1053	5.95	386	2.4	4.80	15.78	448.5	102.54	300
1058	— SAMPLED —							MS/MSD Taken here
1128	6.16	412	2.5	10.47	18.12	378.1	102.54	300

Purge Cycle (End): 52/18 secs @ 90 psi
Flow Rate (ml/min End): 300
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.0
Total Purge Volume (Gallons): ~3.5
Purge Water Management: Onsite containment
Purge Observations (color, odor, turbidity, sheen): Clear gray, no odor, no sheen
Purge @ 1015

Sample Time: 1058
Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [X] CCR Appendix III and IV Constituents
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [ ] Other: App IV: As, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra-226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: Brandon C
Date: 05/01/18
Page 1 of 1

QA/QC Signature:
Date: 5/2/2018

GOLDER

MICROPURGE SAMPLING LOG

Date: 05/01/18

Weather: sunny 70's °F

Project Name: Bremo

Project No./Task No.: 1789751 / 18.100

Event: North Pond

Sampler(s): B. Euker

Well ID: MW-35

Field Calibration Completed: 0935 on 05/01/18

Well Diameter: 2.0 inches

Initial Depth to Water: 107.64 feet

Depth to Bottom: — feet

Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Eddo SN: 12537
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1155	8.58	541	11.9	3.81	16.00	-77.5	108.12	300
1200	8.13	525	7.4	2.40	16.21	-211.6	108.06	300
1205	7.82	520	6.5	1.88	15.72	-189.2	107.98	300
1210	7.53	499	5.3	1.70	16.00	-157.8	108.19	300
1215	7.37	475	4.9	1.60	15.58	-143.4	108.04	300
1220	7.32	468	4.5	2.00	15.65	-136.6	108.05	300
1225	7.27	470	4.8	1.36	16.00	-133.8	108.05	300
1228	—	SAMPLED	—	—	—	—	—	—
1242	7.19	501	5.1	1.29	16.36	-125.3	108.01	300

Purge Cycle (End): 47/13 @ 80 psi

Flow Rate (ml/min End): 300

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.8

Total Purge Volume (Gallons): ~5.2

Purge Water Management: onsite containment

Purge Observations (color, odor, turbidity, sheen): clear grab, no odor, no sheen

Purge at 1140

Sample Time: 1228

Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [x] CCR Appendix III and IV Constituents
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [ ] Other: App IV: Ar, Be, Co, Fl, Pb, Li, Hg, Mo, Ra 226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 05/01/18

QA/QC Signature: _____ Date: 5/2/2018

MICROPURGE SAMPLING LOG

Golder Associates

Date: 4/30/18
Weather: Sunny 60's

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ AR 1784754 18.100
Event: CCR
Sampler(s): AKeane
Well ID: Field Blank
Field Calibration Completed: —
Well Diameter: 2 inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- ☐ WL Indicator
- ☐ Turbidity Meter
- ☐ Air Tank
- ☐ Dedicated Bladder Pump
- ☐ YSI _____
- ☐ Peristaltic Pump
- ☐ Compressor
- ☐ Non-dedicated BP
- ☐ In-Situ _____
- ☐ MP-10 Controller Box
- ☐ MP-15 Controller Box
- ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1530	—	—	SAMPLED	—	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): —
Purge Water Management: —
Purge Observations (color, odor, turbidity, sheen): Clear grab sample Taken near MW-27D using Lab provided DI water
Sample Time: 1530
Field Filtered (0.45um): ☐ Yes ☑ No

Sample Parameters/Analyte(s):
- ☐ VSWMR Table 3.1 Column A VOCs
- ☐ VSWMR Table 3.1 Column A Metals
- ☐ VSWMR Table 3.1 Column B
- ☑ ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR

Other Observations / Equipment Operation Problems: CCR App III & App IV: As, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra 226-228

Sampler Signature: [signature] Date: 4/30/18
QA/QC Signature: [signature] Date: 5/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 5/1/18
Weather: Sunny 70's

Project Name: Bremo Power Station
Project No./Task No.: ~~1520347.230~~ AR 1789 75418.100
Event: CCR
Sampler(s): A. Keene
Well ID: Equipment Blank
Field Calibration Completed: —
Well Diameter: 2 inches
Initial Depth to Water: — feet
Depth to Bottom: — feet
Water Column Thickness: — feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI _____
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [ ] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1330	—	— SAMPLED	—	—	—	—	—	—

Purge Cycle (End): — @ — psi
Flow Rate (ml/min End): —
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —
Total Purge Volume (Gallons): —
Purge Water Management: —
Purge Observations (color, odor, turbidity, sheen): Sampled using Lab provided DI water Clear grab sample sampled over WL indicator near MW-24
Sample Time: 1330
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] ~~Other: 8020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR CCR App III & IV: Ar, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra-226/228

Other Observations / Equipment Operation Problems:

Sampler Signature: AR Date: 5/1/18 Page 1 of 1
QA/QC Signature: Brandon C Date: 5/2/18

MICROPURGE SAMPLING LOG

Golder Associates

Date: 4/30/18

Weather: Sunny 60's

Project Name: Bremo Power Station

Project No./Task No.: ~~1520347.230~~ AR 1789754 / 8.100

Event: CCR

Sampler(s): A. Keene

Well ID: Duplicate

Field Calibration Completed: –

Well Diameter: 2 inches

Initial Depth to Water: – feet

Depth to Bottom: – feet

Water Column Thickness: – feet

Equipment Used:
- ☐ WL Indicator
- ☐ YSI _____
- ☐ In-Situ _____
- ☐ Turbidity Meter
- ☐ Peristaltic Pump
- ☐ MP-10 Controller Box
- ☐ Air Tank
- ☐ Compressor
- ☐ MP-15 Controller Box
- ☐ Dedicated Bladder Pump
- ☐ Non-dedicated BP
- ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1450	—	—	SAMPLED	—	—	—	—	—

Purge Cycle (End): – @ – psi

Flow Rate (ml/min End): –

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): –

Total Purge Volume (Gallons): –

Purge Water Management: –

Purge Observations (color, odor, turbidity, sheen): clear grab sample Taken @ MW-11

Sample Time: 1450

Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s):
- ☐ VSWMR Table 3.1 Column A VOCs
- ☐ VSWMR Table 3.1 Column A Metals
- ☐ VSWMR Table 3.1 Column B
- ☑ ~~Other: 6020 metals, Hg, TDS, sulfate, chloride, fluoride, radium 226/228~~ AR

Other Observations / Equipment Operation Problems: CCR App III & App IV: As, Ba, Co, Fl, Pb, Li, Hg, Mo, Ra 226/228

Sampler Signature: [signature] Date: 4/30/18

QA/QC Signature: [signature] Date: 5/2/18

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

June 08, 2018

Mike Williams
Golder Associates
2108 W Laburnum Ave
Suite 200
Richmond, VA 23227

RE: Project: Bremo North Pond CCR
Pace Project No.: 92383047

Dear Mike Williams:
Enclosed are the analytical results for sample(s) received by the laboratory on May 01, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
(704)875-9092
Project Manager

Enclosures

cc: Craig LaCosse, Golder Associates Inc.
Rachel Powell, Golder Associates
Amanda Reynolds, Golder Associates
Martha Smith, Golder Associates Inc.

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Minnesota Certification IDs

1700 Elm Street SE, Suite 200, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #:MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010

REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Pennsylvania Certification IDs

Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

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SAMPLE SUMMARY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92383047001	**MW-11**	Water	04/30/18 14:40	05/01/18 16:13
92383047002	**MW-29S**	Water	05/01/18 12:05	05/01/18 16:13
92383047003	**MW-29D**	Water	05/01/18 10:52	05/01/18 16:13
92383047004	**MW-24**	Water	05/01/18 14:02	05/01/18 16:13
92383047005	**MW-27D**	Water	04/30/18 16:02	05/01/18 16:13
92383047006	**MW-33**	Water	04/30/18 15:32	05/01/18 16:13
92383047007	**MW-34**	Water	05/01/18 10:58	05/01/18 16:13
92383047008	**MW-35**	Water	05/01/18 12:28	05/01/18 16:13
92383047009	**Field Blank**	Water	04/30/18 15:30	05/01/18 16:13
92383047010	**Equipment Blank**	Water	05/01/18 13:30	05/01/18 16:13
92383047011	**Duplicate Sample**	Water	04/30/18 14:50	05/01/18 16:13

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92383047001	**MW-11**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047002	**MW-29S**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047003	**MW-29D**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047004	**MW-24**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047005	**MW-27D**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	MJP	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047006	**MW-33**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047007	**MW-34**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047008	**MW-35**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047009	**Field Blank**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047010	**Equipment Blank**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M

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SAMPLE ANALYTE COUNT

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A
92383047011	**Duplicate Sample**	EPA 6010	SH1	7	PASI-A
		EPA 6020A	TT3	1	PASI-M
		EPA 7470	JMW1	1	PASI-A
		EPA 903.1	KAC	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	RMK	1	PASI-PA
		SM 2540C	NAL	1	PASI-A
		EPA 300.0	CDC	3	PASI-A

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92383047001	**MW-11**					
EPA 6010	Barium	3.1J	ug/L	5.0	05/08/18 19:35	
EPA 6010	Calcium	19.6	mg/L	0.10	05/08/18 19:35	
EPA 6020A	Lithium	0.48J	ug/L	0.50	05/09/18 18:35	
EPA 903.1	Radium-226	0.0681 ± 0.443 (0.893) C:NA T:81%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	0.219 ± 0.431 (0.946) C:81% T:81%	pCi/L		05/22/18 14:43	
Total Radium Calculation	Total Radium	0.287 ± 0.874 (1.84)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	141	mg/L	25.0	05/04/18 15:42	
EPA 300.0	Chloride	9.4	mg/L	1.0	05/06/18 20:55	
EPA 300.0	Sulfate	6.2	mg/L	1.0	05/06/18 20:55	
92383047002	**MW-29S**					
EPA 6010	Barium	37.3	ug/L	5.0	05/08/18 19:38	
EPA 6010	Calcium	15.8	mg/L	0.10	05/08/18 19:38	
EPA 6020A	Lithium	0.80	ug/L	0.50	05/09/18 18:38	
EPA 903.1	Radium-226	-0.186 ± 0.322 (0.811) C:NA T:88%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	0.0797 ± 0.434 (0.983) C:78% T:79%	pCi/L		05/22/18 14:43	
Total Radium Calculation	Total Radium	0.0797 ± 0.756 (1.79)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	178	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	29.3	mg/L	1.0	05/06/18 21:12	
EPA 300.0	Sulfate	26.2	mg/L	1.0	05/06/18 21:12	
92383047003	**MW-29D**					
EPA 6010	Barium	27.1	ug/L	5.0	05/08/18 19:41	
EPA 6010	Boron	0.054	mg/L	0.050	05/08/18 19:41	
EPA 6010	Calcium	47.3	mg/L	0.10	05/08/18 19:41	
EPA 6020A	Lithium	2.0	ug/L	0.50	05/09/18 18:41	
EPA 903.1	Radium-226	0.358 ± 0.407 (0.642) C:NA T:92%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	0.506 ± 0.456 (0.932) C:75% T:74%	pCi/L		05/22/18 14:43	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92383047003	**MW-29D**					
Total Radium Calculation	Total Radium	0.864 ± 0.863 (1.57)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	612	mg/L	50.0	05/06/18 15:21	
EPA 300.0	Chloride	45.2	mg/L	1.0	05/06/18 21:29	
EPA 300.0	Fluoride	0.15	mg/L	0.10	05/06/18 21:29	
EPA 300.0	Sulfate	99.6	mg/L	2.0	05/07/18 08:50	
92383047004	**MW-24**					
EPA 6010	Barium	56.6	ug/L	5.0	05/08/18 19:44	
EPA 6010	Boron	0.17	mg/L	0.050	05/08/18 19:44	
EPA 6010	Calcium	47.4	mg/L	0.10	05/08/18 19:44	
EPA 6010	Molybdenum	24.0	ug/L	5.0	05/08/18 19:44	
EPA 6020A	Lithium	1.9	ug/L	0.50	05/09/18 18:44	
EPA 903.1	Radium-226	0.0558 ± 0.255 (0.518) C:NA T:98%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	1.04 ± 0.534 (0.984) C:74% T:90%	pCi/L		05/22/18 14:43	
Total Radium Calculation	Total Radium	1.10 ± 0.789 (1.50)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	283	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	32.9	mg/L	1.0	05/06/18 21:46	
EPA 300.0	Fluoride	0.069J	mg/L	0.10	05/06/18 21:46	
EPA 300.0	Sulfate	28.1	mg/L	1.0	05/06/18 21:46	
92383047005	**MW-27D**					
EPA 6010	Barium	39.1	ug/L	5.0	05/08/18 19:54	
EPA 6010	Boron	0.96	mg/L	0.050	05/08/18 19:54	
EPA 6010	Calcium	63.8	mg/L	0.10	05/08/18 19:54	
EPA 6010	Molybdenum	16.1	ug/L	5.0	05/08/18 19:54	
EPA 6020A	Lithium	57.6	ug/L	0.50	05/09/18 18:47	
EPA 903.1	Radium-226	0.882 ± 0.558 (0.630) C:NA T:86%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	0.474 ± 0.471 (0.982) C:77% T:79%	pCi/L		05/22/18 14:43	
Total Radium Calculation	Total Radium	1.36 ± 1.03 (1.61)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	1050	mg/L	50.0	05/04/18 15:42	
EPA 300.0	Chloride	13.3	mg/L	1.0	05/06/18 22:03	
EPA 300.0	Fluoride	0.15	mg/L	0.10	05/06/18 22:03	
EPA 300.0	Sulfate	408	mg/L	8.0	05/07/18 09:07	

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92383047006	**MW-33**					
EPA 6010	Barium	23.3	ug/L	5.0	05/08/18 19:57	
EPA 6010	Boron	0.22	mg/L	0.050	05/08/18 19:57	
EPA 6010	Calcium	73.7	mg/L	0.10	05/08/18 19:57	
EPA 6010	Molybdenum	4.0J	ug/L	5.0	05/08/18 19:57	
EPA 6020A	Lithium	3.5	ug/L	0.50	05/09/18 18:49	
EPA 903.1	Radium-226	0.440 ± 0.412 (0.584) C:NA T:89%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	-0.698 ± 0.496 (1.22) C:74% T:75%	pCi/L		05/22/18 14:43	
Total Radium Calculation	Total Radium	0.440 ± 0.908 (1.80)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	340	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	19.6	mg/L	1.0	05/06/18 22:20	
EPA 300.0	Fluoride	0.061J	mg/L	0.10	05/06/18 22:20	
EPA 300.0	Sulfate	42.5	mg/L	1.0	05/06/18 22:20	
92383047007	**MW-34**					
EPA 6010	Barium	44.4	ug/L	5.0	05/08/18 20:00	
EPA 6010	Boron	1.2	mg/L	0.050	05/08/18 20:00	
EPA 6010	Calcium	36.8	mg/L	0.10	05/08/18 20:00	
EPA 6020A	Lithium	6.7	ug/L	0.50	05/09/18 18:52	
EPA 7470	Mercury	0.38	ug/L	0.20	05/07/18 10:14	
EPA 903.1	Radium-226	0.0609 ± 0.278 (0.565) C:NA T:88%	pCi/L		05/23/18 10:57	
EPA 904.0	Radium-228	0.0986 ± 0.281 (0.631) C:81% T:81%	pCi/L		05/22/18 14:39	
Total Radium Calculation	Total Radium	0.160 ± 0.559 (1.20)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	252	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	13.6	mg/L	1.0	05/06/18 22:37	M1
EPA 300.0	Fluoride	0.053J	mg/L	0.10	05/06/18 22:37	
EPA 300.0	Sulfate	27.0	mg/L	1.0	05/06/18 22:37	
92383047008	**MW-35**					
EPA 6010	Barium	108	ug/L	5.0	05/08/18 20:09	
EPA 6010	Boron	0.28	mg/L	0.050	05/08/18 20:09	
EPA 6010	Calcium	53.2	mg/L	0.10	05/08/18 20:09	
EPA 6010	Molybdenum	3.4J	ug/L	5.0	05/08/18 20:09	
EPA 6020A	Lithium	33.1	ug/L	0.50	05/09/18 19:15	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92383047008	**MW-35**					
EPA 903.1	Radium-226	0.285 ± 0.434 (0.747) C:NA T:95%	pCi/L		05/23/18 11:13	
EPA 904.0	Radium-228	0.554 ± 0.367 (0.695) C:75% T:84%	pCi/L		05/22/18 14:39	
Total Radium Calculation	Total Radium	0.839 ± 0.801 (1.44)	pCi/L		05/24/18 16:53	
SM 2540C	Total Dissolved Solids	294	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	9.9	mg/L	1.0	05/07/18 00:02	
EPA 300.0	Sulfate	31.2	mg/L	1.0	05/07/18 00:02	
92383047009	**Field Blank**					
EPA 6020A	Lithium	0.18J	ug/L	0.50	05/09/18 19:20	
EPA 903.1	Radium-226	0.427 ± 0.399 (0.566) C:NA T:90%	pCi/L		05/23/18 11:13	
EPA 904.0	Radium-228	0.199 ± 0.335 (0.729) C:82% T:81%	pCi/L		05/22/18 14:34	
Total Radium Calculation	Total Radium	0.626 ± 0.734 (1.30)	pCi/L		05/24/18 16:53	
92383047010	**Equipment Blank**					
EPA 6020A	Lithium	0.18J	ug/L	0.50	05/09/18 19:23	
EPA 903.1	Radium-226	-0.061 ± 0.277 (0.563) C:NA T:92%	pCi/L		05/23/18 11:13	
EPA 904.0	Radium-228	0.164 ± 0.322 (0.709) C:85% T:81%	pCi/L		05/22/18 14:35	
Total Radium Calculation	Total Radium	0.164 ± 0.599 (1.27)	pCi/L		05/24/18 16:53	
92383047011	**Duplicate Sample**					
EPA 6010	Barium	3.1J	ug/L	5.0	05/08/18 20:18	
EPA 6010	Calcium	19.6	mg/L	0.10	05/08/18 20:18	
EPA 6020A	Lithium	0.55	ug/L	0.50	05/09/18 19:17	
EPA 903.1	Radium-226	0.162 ± 0.281 (0.502) C:NA T:96%	pCi/L		05/23/18 11:13	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SUMMARY OF DETECTION

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92383047011	**Duplicate Sample**					
EPA 904.0	Radium-228	0.851 ± 0.441 (0.807) C:84% T:88%	pCi/L		05/22/18 14:35	
Total Radium Calculation	Total Radium	1.01 ± 0.722 (1.31)	pCi/L		05/24/18 16:56	
SM 2540C	Total Dissolved Solids	147	mg/L	25.0	05/06/18 15:21	
EPA 300.0	Chloride	9.6	mg/L	1.0	05/07/18 00:53	
EPA 300.0	Sulfate	6.1	mg/L	1.0	05/07/18 00:53	

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-11 **Lab ID: 92383047001** Collected: 04/30/18 14:40 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:35	7440-38-2	
Barium	**3.1J**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:35	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:35	7440-42-8	
Calcium	**19.6**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:35	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:35	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:35	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:35	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**0.48J**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:35	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 09:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**141**	mg/L	25.0	25.0	1		05/04/18 15:42		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.4**	mg/L	1.0	0.50	1		05/06/18 20:55	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/06/18 20:55	16984-48-8	
Sulfate	**6.2**	mg/L	1.0	0.50	1		05/06/18 20:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-29S **Lab ID: 92383047002** Collected: 05/01/18 12:05 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:38	7440-38-2	
Barium	**37.3**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:38	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:38	7440-42-8	
Calcium	**15.8**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:38	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:38	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:38	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:38	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**0.80**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:38	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 09:58	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**178**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**29.3**	mg/L	1.0	0.50	1		05/06/18 21:12	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/06/18 21:12	16984-48-8	
Sulfate	**26.2**	mg/L	1.0	0.50	1		05/06/18 21:12	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-29D **Lab ID: 92383047003** Collected: 05/01/18 10:52 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:41	7440-38-2	
Barium	**27.1**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:41	7440-39-3	
Boron	**0.054**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:41	7440-42-8	
Calcium	**47.3**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:41	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:41	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:41	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:41	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**2.0**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:41	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:00	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**612**	mg/L	50.0	50.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**45.2**	mg/L	1.0	0.50	1		05/06/18 21:29	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	0.050	1		05/06/18 21:29	16984-48-8	
Sulfate	**99.6**	mg/L	2.0	1.0	2		05/07/18 08:50	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-24 **Lab ID: 92383047004** Collected: 05/01/18 14:02 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:44	7440-38-2	
Barium	**56.6**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:44	7440-39-3	
Boron	**0.17**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:44	7440-42-8	
Calcium	**47.4**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:44	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:44	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:44	7439-92-1	
Molybdenum	**24.0**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:44	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**1.9**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:44	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:02	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**283**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**32.9**	mg/L	1.0	0.50	1		05/06/18 21:46	16887-00-6	
Fluoride	**0.069J**	mg/L	0.10	0.050	1		05/06/18 21:46	16984-48-8	
Sulfate	**28.1**	mg/L	1.0	0.50	1		05/06/18 21:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-27D **Lab ID: 92383047005** Collected: 04/30/18 16:02 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:54	7440-38-2	
Barium	**39.1**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:54	7440-39-3	
Boron	**0.96**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:54	7440-42-8	
Calcium	**63.8**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:54	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:54	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:54	7439-92-1	
Molybdenum	**16.1**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:54	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**57.6**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:47	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**1050**	mg/L	50.0	50.0	1		05/04/18 15:42		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.3**	mg/L	1.0	0.50	1		05/06/18 22:03	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	0.050	1		05/06/18 22:03	16984-48-8	
Sulfate	**408**	mg/L	8.0	4.0	8		05/07/18 09:07	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-33 **Lab ID: 92383047006** Collected: 04/30/18 15:32 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 19:57	7440-38-2	
Barium	**23.3**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:57	7440-39-3	
Boron	**0.22**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 19:57	7440-42-8	
Calcium	**73.7**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 19:57	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:57	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:57	7439-92-1	
Molybdenum	**4.0J**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 19:57	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**3.5**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:49	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:12	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**340**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**19.6**	mg/L	1.0	0.50	1		05/06/18 22:20	16887-00-6	
Fluoride	**0.061J**	mg/L	0.10	0.050	1		05/06/18 22:20	16984-48-8	
Sulfate	**42.5**	mg/L	1.0	0.50	1		05/06/18 22:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-34 **Lab ID: 92383047007** Collected: 05/01/18 10:58 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 20:00	7440-38-2	
Barium	**44.4**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:00	7440-39-3	
Boron	**1.2**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 20:00	7440-42-8	
Calcium	**36.8**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 20:00	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:00	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:00	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:00	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**6.7**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 18:52	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	**0.38**	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:14	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**252**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**13.6**	mg/L	1.0	0.50	1		05/06/18 22:37	16887-00-6	M1
Fluoride	**0.053J**	mg/L	0.10	0.050	1		05/06/18 22:37	16984-48-8	
Sulfate	**27.0**	mg/L	1.0	0.50	1		05/06/18 22:37	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-35 **Lab ID: 92383047008** Collected: 05/01/18 12:28 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 20:09	7440-38-2	
Barium	**108**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:09	7440-39-3	
Boron	**0.28**	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 20:09	7440-42-8	
Calcium	**53.2**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 20:09	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:09	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:09	7439-92-1	
Molybdenum	**3.4J**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:09	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**33.1**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 19:15	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:21	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**294**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.9**	mg/L	1.0	0.50	1		05/07/18 00:02	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/07/18 00:02	16984-48-8	
Sulfate	**31.2**	mg/L	1.0	0.50	1		05/07/18 00:02	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Field Blank **Lab ID: 92383047009** Collected: 04/30/18 15:30 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 20:12	7440-38-2	
Barium	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:12	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 20:12	7440-42-8	
Calcium	ND	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 20:12	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:12	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:12	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:12	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**0.18J**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 19:20	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:24	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	ND	mg/L	1.0	0.50	1		05/07/18 00:19	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/07/18 00:19	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		05/07/18 00:19	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Equipment Blank **Lab ID: 92383047010** Collected: 05/01/18 13:30 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 20:15	7440-38-2	
Barium	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:15	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 20:15	7440-42-8	
Calcium	ND	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 20:15	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:15	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:15	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:15	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**0.18J**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 19:23	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:26	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	ND	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	ND	mg/L	1.0	0.50	1		05/07/18 00:36	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/07/18 00:36	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		05/07/18 00:36	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Duplicate Sample **Lab ID: 92383047011** Collected: 04/30/18 14:50 Received: 05/01/18 16:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	05/04/18 03:40	05/08/18 20:18	7440-38-2	
Barium	**3.1J**	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:18	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	05/04/18 03:40	05/08/18 20:18	7440-42-8	
Calcium	**19.6**	mg/L	0.10	0.050	1	05/04/18 03:40	05/08/18 20:18	7440-70-2	
Cobalt	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:18	7440-48-4	
Lead	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:18	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	05/04/18 03:40	05/08/18 20:18	7439-98-7	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Lithium	**0.55**	ug/L	0.50	0.17	1	05/07/18 12:19	05/09/18 19:17	7439-93-2	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470								
Mercury	ND	ug/L	0.20	0.10	1	05/04/18 15:25	05/07/18 10:28	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C								
Total Dissolved Solids	**147**	mg/L	25.0	25.0	1		05/06/18 15:21		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0								
Chloride	**9.6**	mg/L	1.0	0.50	1		05/07/18 00:53	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		05/07/18 00:53	16984-48-8	
Sulfate	**6.1**	mg/L	1.0	0.50	1		05/07/18 00:53	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 409320 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 2270770 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	05/07/18 09:11	

LABORATORY CONTROL SAMPLE: 2270771

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.5	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2270772 2270773

Parameter	Units	92382714017 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.6	2.8	104	110	75-125	6	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2272106 2272107

Parameter	Units	92383047007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	0.38	2.5	2.5	2.8	2.4	97	82	75-125	14	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 409274 Analysis Method: EPA 6010
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 2270551 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	10.0	5.0	05/08/18 19:05	
Barium	ug/L	ND	5.0	2.5	05/08/18 19:05	
Boron	mg/L	ND	0.050	0.025	05/08/18 19:05	
Calcium	mg/L	ND	0.10	0.050	05/08/18 19:05	
Cobalt	ug/L	ND	5.0	2.5	05/08/18 19:05	
Lead	ug/L	ND	5.0	2.5	05/08/18 19:05	
Molybdenum	ug/L	ND	5.0	2.5	05/08/18 19:05	

LABORATORY CONTROL SAMPLE: 2270552

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	468	94	80-120	
Barium	ug/L	500	494	99	80-120	
Boron	mg/L	.5	0.48	96	80-120	
Calcium	mg/L	5	4.9	99	80-120	
Cobalt	ug/L	500	480	96	80-120	
Lead	ug/L	500	472	94	80-120	
Molybdenum	ug/L	500	496	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2270553 2270554

Parameter	Units	92383047007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	500	500	456	445	91	88	75-125	2	20	
Barium	ug/L	44.4	500	500	558	542	103	100	75-125	3	20	
Boron	mg/L	1.2	.5	.5	1.7	1.6	103	95	75-125	3	20	
Calcium	mg/L	36.8	5	5	42.0	40.8	104	81	75-125	3	20	
Cobalt	ug/L	ND	500	500	457	445	91	89	75-125	3	20	
Lead	ug/L	ND	500	500	451	440	90	88	75-125	2	20	
Molybdenum	ug/L	ND	500	500	488	475	98	95	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 536382 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 2915987 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lithium	ug/L	ND	0.50	0.17	05/09/18 18:32	

LABORATORY CONTROL SAMPLE: 2915988

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lithium	ug/L	100	103	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2915989 2915990

Parameter	Units	92383047007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lithium	ug/L	6.7	100	100	104	103	97	96	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 409205 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92383047001, 92383047005

METHOD BLANK: 2270261 Matrix: Water
Associated Lab Samples: 92383047001, 92383047005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	05/04/18 15:42	

LABORATORY CONTROL SAMPLE: 2270262

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	242	97	90-110	

SAMPLE DUPLICATE: 2270263

Parameter	Units	92382899001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	457		5	

SAMPLE DUPLICATE: 2270264

Parameter	Units	92382899011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	680	640	6	5	D6

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 409527 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92383047002, 92383047003, 92383047004, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 2271925 Matrix: Water
Associated Lab Samples: 92383047002, 92383047003, 92383047004, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	05/06/18 15:21	

LABORATORY CONTROL SAMPLE: 2271926

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	252	101	90-110	

SAMPLE DUPLICATE: 2271927

Parameter	Units	92383047006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	340	339	0	5	

SAMPLE DUPLICATE: 2271928

Parameter	Units	92383047007 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	252	254	1	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 409522 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 2271901 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	05/06/18 16:39	
Fluoride	mg/L	ND	0.10	0.050	05/06/18 16:39	
Sulfate	mg/L	ND	1.0	0.50	05/06/18 16:39	

LABORATORY CONTROL SAMPLE: 2271902

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	48.3	97	90-110	
Fluoride	mg/L	2.5	2.7	108	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271903 2271904

Parameter	Units	92383436003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.2	50	50	54.0	56.0	104	108	90-110	4	10	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.6	99	103	90-110	3	10	
Sulfate	mg/L	2.0	50	50	53.8	55.9	104	108	90-110	4	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2271905 2271906

Parameter	Units	92383047007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	13.6	50	50	68.6	68.9	110	111	90-110	0	10	M1
Fluoride	mg/L	0.053J	2.5	2.5	2.7	2.7	106	107	90-110	0	10	
Sulfate	mg/L	27.0	50	50	81.1	81.6	108	109	90-110	1	10	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-11 **Lab ID: 92383047001** Collected: 04/30/18 14:40 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0681 ± 0.443 (0.893) C:NA T:81%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**0.219 ± 0.431 (0.946) C:81% T:81%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.287 ± 0.874 (1.84)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-29S **Lab ID: 92383047002** Collected: 05/01/18 12:05 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.186 ± 0.322 (0.811) C:NA T:88%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**0.0797 ± 0.434 (0.983) C:78% T:79%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.0797 ± 0.756 (1.79)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-29D **Lab ID: 92383047003** Collected: 05/01/18 10:52 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.358 ± 0.407 (0.642) C:NA T:92%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**0.506 ± 0.456 (0.932) C:75% T:74%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.864 ± 0.863 (1.57)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-24 **Lab ID: 92383047004** Collected: 05/01/18 14:02 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0558 ± 0.255 (0.518) C:NA T:98%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**1.04 ± 0.534 (0.984) C:74% T:90%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**1.10 ± 0.789 (1.50)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-27D **Lab ID: 92383047005** Collected: 04/30/18 16:02 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.882 ± 0.558 (0.630) C:NA T:86%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**0.474 ± 0.471 (0.982) C:77% T:79%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**1.36 ± 1.03 (1.61)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-33 **Lab ID: 92383047006** Collected: 04/30/18 15:32 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.440 ± 0.412 (0.584) C:NA T:89%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**-0.698 ± 0.496 (1.22) C:74% T:75%**	pCi/L	05/22/18 14:43	15262-20-1	
Total Radium	Total Radium Calculation	**0.440 ± 0.908 (1.80)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-34 **Lab ID: 92383047007** Collected: 05/01/18 10:58 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0609 ± 0.278 (0.565) C:NA T:88%**	pCi/L	05/23/18 10:57	13982-63-3	
Radium-228	EPA 904.0	**0.0986 ± 0.281 (0.631) C:81% T:81%**	pCi/L	05/22/18 14:39	15262-20-1	
Total Radium	Total Radium Calculation	**0.160 ± 0.559 (1.20)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: MW-35 **Lab ID: 92383047008** Collected: 05/01/18 12:28 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.285 ± 0.434 (0.747) C:NA T:95%**	pCi/L	05/23/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**0.554 ± 0.367 (0.695) C:75% T:84%**	pCi/L	05/22/18 14:39	15262-20-1	
Total Radium	Total Radium Calculation	**0.839 ± 0.801 (1.44)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Field Blank **Lab ID: 92383047009** Collected: 04/30/18 15:30 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.427 ± 0.399 (0.566) C:NA T:90%**	pCi/L	05/23/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**0.199 ± 0.335 (0.729) C:82% T:81%**	pCi/L	05/22/18 14:34	15262-20-1	
Total Radium	Total Radium Calculation	**0.626 ± 0.734 (1.30)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Equipment Blank **Lab ID: 92383047010** Collected: 05/01/18 13:30 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.061 ± 0.277 (0.563) C:NA T:92%**	pCi/L	05/23/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**0.164 ± 0.322 (0.709) C:85% T:81%**	pCi/L	05/22/18 14:35	15262-20-1	
Total Radium	Total Radium Calculation	**0.164 ± 0.599 (1.27)**	pCi/L	05/24/18 16:53	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Sample: Duplicate Sample **Lab ID: 92383047011** Collected: 04/30/18 14:50 Received: 05/01/18 16:13 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.162 ± 0.281 (0.502) C:NA T:96%**	pCi/L	05/23/18 11:13	13982-63-3	
Radium-228	EPA 904.0	**0.851 ± 0.441 (0.807) C:84% T:88%**	pCi/L	05/22/18 14:35	15262-20-1	
Total Radium	Total Radium Calculation	**1.01 ± 0.722 (1.31)**	pCi/L	05/24/18 16:56	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 297318 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92383047009, 92383047010, 92383047011

METHOD BLANK: 1455497 Matrix: Water
Associated Lab Samples: 92383047009, 92383047010, 92383047011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.381 ± 0.306 (0.605) C:86% T:80%	pCi/L	05/22/18 14:34	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 297296 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

METHOD BLANK: 1455470 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008, 92383047009, 92383047010, 92383047011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.306 ± 0.433 (0.734) C:NA T:87%	pCi/L	05/23/18 10:44	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo North Pond CCR
Pace Project No.: 92383047

QC Batch: 297317 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008

METHOD BLANK: 1455496 Matrix: Water
Associated Lab Samples: 92383047001, 92383047002, 92383047003, 92383047004, 92383047005, 92383047006, 92383047007, 92383047008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.295 ± 0.282 (0.720) C:84% T:82%	pCi/L	05/22/18 11:23	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALIFIERS

Project: Bremo North Pond CCR
Pace Project No.: 92383047

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92383047001	**MW-11**	EPA 3010A	409274	EPA 6010	409408
92383047002	**MW-29S**	EPA 3010A	409274	EPA 6010	409408
92383047003	**MW-29D**	EPA 3010A	409274	EPA 6010	409408
92383047004	**MW-24**	EPA 3010A	409274	EPA 6010	409408
92383047005	**MW-27D**	EPA 3010A	409274	EPA 6010	409408
92383047006	**MW-33**	EPA 3010A	409274	EPA 6010	409408
92383047007	**MW-34**	EPA 3010A	409274	EPA 6010	409408
92383047008	**MW-35**	EPA 3010A	409274	EPA 6010	409408
92383047009	**Field Blank**	EPA 3010A	409274	EPA 6010	409408
92383047010	**Equipment Blank**	EPA 3010A	409274	EPA 6010	409408
92383047011	**Duplicate Sample**	EPA 3010A	409274	EPA 6010	409408
92383047001	**MW-11**	EPA 3020	536382	EPA 6020A	537161
92383047002	**MW-29S**	EPA 3020	536382	EPA 6020A	537161
92383047003	**MW-29D**	EPA 3020	536382	EPA 6020A	537161
92383047004	**MW-24**	EPA 3020	536382	EPA 6020A	537161
92383047005	**MW-27D**	EPA 3020	536382	EPA 6020A	537161
92383047006	**MW-33**	EPA 3020	536382	EPA 6020A	537161
92383047007	**MW-34**	EPA 3020	536382	EPA 6020A	537161
92383047008	**MW-35**	EPA 3020	536382	EPA 6020A	537161
92383047009	**Field Blank**	EPA 3020	536382	EPA 6020A	537161
92383047010	**Equipment Blank**	EPA 3020	536382	EPA 6020A	537161
92383047011	**Duplicate Sample**	EPA 3020	536382	EPA 6020A	537161
92383047001	**MW-11**	EPA 7470	409320	EPA 7470	409434
92383047002	**MW-29S**	EPA 7470	409320	EPA 7470	409434
92383047003	**MW-29D**	EPA 7470	409320	EPA 7470	409434
92383047004	**MW-24**	EPA 7470	409320	EPA 7470	409434
92383047005	**MW-27D**	EPA 7470	409320	EPA 7470	409434
92383047006	**MW-33**	EPA 7470	409320	EPA 7470	409434
92383047007	**MW-34**	EPA 7470	409320	EPA 7470	409434
92383047008	**MW-35**	EPA 7470	409320	EPA 7470	409434
92383047009	**Field Blank**	EPA 7470	409320	EPA 7470	409434
92383047010	**Equipment Blank**	EPA 7470	409320	EPA 7470	409434
92383047011	**Duplicate Sample**	EPA 7470	409320	EPA 7470	409434
92383047001	**MW-11**	EPA 903.1	297296		
92383047002	**MW-29S**	EPA 903.1	297296		
92383047003	**MW-29D**	EPA 903.1	297296		
92383047004	**MW-24**	EPA 903.1	297296		
92383047005	**MW-27D**	EPA 903.1	297296		
92383047006	**MW-33**	EPA 903.1	297296		
92383047007	**MW-34**	EPA 903.1	297296		
92383047008	**MW-35**	EPA 903.1	297296		
92383047009	**Field Blank**	EPA 903.1	297296		
92383047010	**Equipment Blank**	EPA 903.1	297296		
92383047011	**Duplicate Sample**	EPA 903.1	297296		
92383047001	**MW-11**	EPA 904.0	297317		
92383047002	**MW-29S**	EPA 904.0	297317		
92383047003	**MW-29D**	EPA 904.0	297317		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo North Pond CCR
Pace Project No.: 92383047

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92383047004	**MW-24**	EPA 904.0	297317		
92383047005	**MW-27D**	EPA 904.0	297317		
92383047006	**MW-33**	EPA 904.0	297317		
92383047007	**MW-34**	EPA 904.0	297317		
92383047008	**MW-35**	EPA 904.0	297317		
92383047009	**Field Blank**	EPA 904.0	297318		
92383047010	**Equipment Blank**	EPA 904.0	297318		
92383047011	**Duplicate Sample**	EPA 904.0	297318		
92383047001	**MW-11**	Total Radium Calculation	299751		
92383047002	**MW-29S**	Total Radium Calculation	299751		
92383047003	**MW-29D**	Total Radium Calculation	299751		
92383047004	**MW-24**	Total Radium Calculation	299751		
92383047005	**MW-27D**	Total Radium Calculation	299751		
92383047006	**MW-33**	Total Radium Calculation	299751		
92383047007	**MW-34**	Total Radium Calculation	299751		
92383047008	**MW-35**	Total Radium Calculation	299751		
92383047009	**Field Blank**	Total Radium Calculation	299751		
92383047010	**Equipment Blank**	Total Radium Calculation	299751		
92383047011	**Duplicate Sample**	Total Radium Calculation	299752		
92383047001	**MW-11**	SM 2540C	409205		
92383047002	**MW-29S**	SM 2540C	409527		
92383047003	**MW-29D**	SM 2540C	409527		
92383047004	**MW-24**	SM 2540C	409527		
92383047005	**MW-27D**	SM 2540C	409205		
92383047006	**MW-33**	SM 2540C	409527		
92383047007	**MW-34**	SM 2540C	409527		
92383047008	**MW-35**	SM 2540C	409527		
92383047009	**Field Blank**	SM 2540C	409527		
92383047010	**Equipment Blank**	SM 2540C	409527		
92383047011	**Duplicate Sample**	SM 2540C	409527		
92383047001	**MW-11**	EPA 300.0	409522		
92383047002	**MW-29S**	EPA 300.0	409522		
92383047003	**MW-29D**	EPA 300.0	409522		
92383047004	**MW-24**	EPA 300.0	409522		
92383047005	**MW-27D**	EPA 300.0	409522		
92383047006	**MW-33**	EPA 300.0	409522		
92383047007	**MW-34**	EPA 300.0	409522		
92383047008	**MW-35**	EPA 300.0	409522		
92383047009	**Field Blank**	EPA 300.0	409522		
92383047010	**Equipment Blank**	EPA 300.0	409522		
92383047011	**Duplicate Sample**	EPA 300.0	409522		

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples: Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☐ Mechanicsville ☒

Sample Condition Upon Receipt

Client Name: Golder Project #:

WO# : 92383047

92383047

Courier: ☐ Commercial ☐ Fed Ex ☐ Pace ☐ UPS ☐ USPS ☐ Other: ☑ Client

Custody Seal Present? ☑ Yes ☐ No Seals Intact? ☑ Yes ☐ No

Date/Initials Person Examining Contents: 5-2-18 RSB

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Thermometer: ☒ IR Gun ID: T-3

Type of Ice: ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 2.5 Correction Factor: Add/subtract (°C) 0.1

Cooler Temp Corrected (°C): 2.6

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: Date/Time:

Project Manager SCURF Review: ACP Date: 050318

Project Manager SRF Review: ACP Date: 050318

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

**Bottom half of box is to list number of bottle

Project # **WO# : 92383047**

PM: NMG Due Date: 05/15/18

CLIENT: 92-Golder

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BPIN	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2																			2				
2		1	1			2																			2				
3		1	1			2																			2				
4		1	1			2																			2				
5		1	1			2																			2				
6		1	1			2																			2				
7		3	3			6																			2				
8		1	1			2																			2				
9		1	1			2																			2				
10		1	1			2																			2				
11		1	1			2																			2				
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2229295

Section A Required Client Information:

Company: Golder Associates
Address: 3108 W Cleveland Ave Suite 208
Richmond VA 23227
Email To: mwilliams@golder.com
Phone: 804-358-7900 Fax: 804-358-2900
Requested Due Date/TAT: STANDARD

Section B Required Project Information:

Report To: mwilliams@golder.com
Copy To: Areynolds@golder.com
Purchase Order No.:
Project Name: Bremo North Pond CCR
Project Number: 1789-754.100

Section C Invoice Information:

Attention: Nicole Gasiorowski
Company Name: Pace Laboratories
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: VA

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Matrix Codes — MATRIX / CODE
Drinking Water DW
Water WT
Waste Water WW
Product P
Soil/Solid SL
Oil OL
Wipe WP
Air AR
Tissue TS
Other OT

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	Boron, Calcium, Chloride, Sulfate, TDS, Fluoride	Arsenic, Barium, Cobalt, Lead, Lithium, Mercury, Molybdenum, Radium 226-228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-11	WT	G	—	—	4/30/18	1440		6	2		4							✓	✓	N	92383047 001
2	MW-29S	WT	G	—	—	5/1/18	1205		6	2		4							✓	✓	N	002
3	MW-29D	WT	G	—	—	5/1/18	1052		6	2		4							✓	✓	N	003
4	MW-24	WT	G	—	—	5/1/18	1402		6	2		4							✓	✓	N	004
5	MW-27D	WT	G	—	—	4/30/18	1602		6	2		4							✓	✓	N	005
6	MW-33	WT	G	—	—	4/30/18	1532		6	2		4							✓	✓	N	006
7	MW-34	WT	G	—	—	5/1/18	1058		6	2		4							✓	✓	N	-MS/MSD Taken @ MW-34 007
8	MW-35	WT	G	—	—	5/1/18	1228		6	2		4							✓	✓	N	008
9	Field Blank	WT	G	—	—	4/30/18	1530		6	2		4							✓	✓	N	009
10	Equipment Blank	WT	G	—	—	5/1/18	1330		6	2		4							✓	✓	N	010
11	Duplicate Sample	WT	G	—	—	4/30/18	1450		6	2		4							✓	✓	N	All samples Preserved on ice 011
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	A. Keene / Golder	5/1/18	1613	Rachel Burruss	5-1-18	1613	2.6	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: A. Keene | B. Euker
SIGNATURE of SAMPLER: [signature] | [signature]
DATE Signed (MM/DD/YY): 05/01/18

ORIGINAL

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

Project Name: Bremo Power Station - North Ash Pond CCR

Project Reference Number: 178975418.100A

Sampling Event Date: April 30 - May 1, 2018

Review Date: 06/08/2018 *Initials:* ALR

Review Date: 06/25/2018 *Initials:* RIP

Person(s) performing the review are to initial each item on this form as acknowledgement of data acceptance, or as acknowledgement of a review issue. In the case of the latter, a brief explanation should follow the applicable item.

Golder Associates Inc. has reviewed the laboratory certificates of analysis, chain-of-custody form, and laboratory provided sample group quality assurance and quality control data for the above referenced sample group to identify potential bias or inaccuracy, in general accordance with the following United States Environmental Protection Agency (EPA) and Department of Energy (DOE) documents:

- National Functional Guidelines for Organic Superfund Methods Data Review, January 2017;
- National Functional Guidelines for Inorganic Superfund Methods Data Review, January 2017;
- US Department of Energy Evaluation of Radiochemical Data Usability, April 1997; and
- Sampling and Analysis Plan for US Department of Energy Office of Legacy Management Sites.

COMMON ACRONYMS:

- MS = matrix spike
- MSD = matrix spike duplicate
- LCS = laboratory control spike
- RPD = relative percent difference
- MB = method blank
- DUP = duplicate
- FB = field blank
- VSWMR = Virginia Solid Waste Management Regulations
- J = estimated
- ND and/or U= not detected
- COC = chain of custody
- QC = quality control
- µg/L = micrograms per liter
- mg/L = milligrams per liter
- EPA = United States Environmental Protection Agency
- pCi/L = picocuries per liter

COMPLIANCE ANALYTE LIST

☐ Historical VPDES Parameters

☒ CCR Appendix III to Part 257

☒ CCR Appendix IV to Part 257: Arsenic, Barium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Radium 226 & 228

☐ VSWMR Phase II Parameters: _____

☐ Other: _____

Note: Pace Project No: 92383047

Golder
2108 West Laburnum Ave., Suite 200
Richmond, Virginia, USA 23227
T: +1 804 358-7900 | F: +1 804 358-2900

1.0 CHAIN OF CUSTODY (COC) REVIEW

Yes COC was properly signed by all parties.

Yes Correct project name and number are on the form.

Yes Sample receipt condition at laboratory was acceptable.

Yes Each sample and blank submitted for analysis appears in the data report.

Note: _____

2.0 SAMPLE HOLDING TIMES

Yes Holding times for extraction *and/or* analysis were met for each analytical method.

Review Criteria		
Method	**Analytes**	**Holding Time**
EPA 9056A	Chloride, fluoride, and sulfate	28 days
EPA 903.1 EPA 904.0	Radium 226 Radium 228	6 months
EPA 6000 series	Metals, except mercury	6 months
EPA 7470	Mercury	28 days
SM 2540C	TDS	7 days

Notes:_____

3.0 LABORATORY QUALITY CONTROL REVIEW

Yes Laboratory analyzed at least one internal blank for each method, where applicable.

Yes Laboratory blanks were interference free.

Notes: The following table presents method blank detections and their associated sample delivery groups (SDG; batch). In accordance with EPA guidance, associated samples within the same batch have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification iis not recommended.

For radiochemistry data, if the reported absolute value of the method blank is above the minimum detectable concentration (MDC) and no other deficiencies are noted in the associated

dataset, detections above the MDC and less than 5 times the concentration reported in the method blank may be blank qualified "J" in accordance with qualification guidance. As presented below, data qualification is not required.

Parameter	Method Blank Detection (µg/L)	Batch	Associated Qualified Sample(s)	Validator Qualifier
--	--	--	--	--

NA Surrogate recoveries are provided for each analytical method, where applicable.

NA Surrogate recoveries for each method are within the acceptable limits.

Notes: _____

Yes Tracer and carrier yields are provided for each analytical method, where applicable (Radiochemical Data Only).

Yes Tracer and carrier yields for each method are within the acceptable limits (Radiochemical Data Only).

Notes: _____

Yes MS/MSD/LCS/RPD data results are provided for each analytical method.

See Note MS/MSD/LCS/RPD recoveries for each method are within the acceptable limits.

Notes: The following table presents recoveries and relative percent differences (RPDs) that were outside of QC limits for the associated sample delivery group (analytical batch). In accordance with EPA guidance for evaluation of spike recoveries, the associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ), or unusable (R) using professional judgement to evaluate the spike recovery. Post-digestion spike recovery will be evaluated for MS/MSD qualification purposes where provided. As presented, no data qualification is recommended. No MS/MSD results were provided for radium-226 or radium-228.

In accordance with EPA guidance for evaluation of RPDs, the associated samples may be qualified estimated (J or UJ) using professional judgement to evaluate the RPD. As presented, no data qualification is recommended.

Parameter	Recovery Outside QC Limits	Batch	Associated Qualified Sample(s)	Validator Qualifier
Total Dissolved Solids	RPD	409205	--	--

Parameter	Recovery Outside QC Limits	Batch	Associated Qualified Sample(s)	Validator Qualifier
Chloride	MSD	409522	--	--

Yes Minimum Detectable Concentrations (MDCs) are provided for radiological samples.

Yes Radiological samples reported below their respective MDC have been qualified with a "U."

Notes: _____

Parameter	Associated Samples Below MDC
Radium-226	MW-11, MW-29S, MW-29D, MW-24, MW-33, MW-34, MW-35, Field Blank, Equipment Blank, Duplicate
Radium-228	MW-11, MW-29S, MW-29D, MW-27D, MW-33, MW-34, MW-35, Field Blank, Equipment Blank

4.0 ANALYTE LISTS/METHODS

Yes The proper number of constituents are present for each analyte list as identified above (including detects where applicable).

Yes Proper EPA SW-846 analytical methods were used for analysis.

Notes: _____

5.0 OUTLIER EVALUATION

Yes Analytical results have been evaluated for variances +/- 25% compared to the average of the most recent 8 data points.

Yes Analytical results with variances >25% have been evaluated for trends.

NA If no trends were identified for analytical results with variances >25%, a data quality review (DQR) was conducted for suspect analytical results identified as possible outliers. DQR results summarized below.

Analyte	Location	DQR identified issues?	Re-analysis requested?	Outlier Identification
--	--	--	--	--

6.0 DATA REPORTING

See Note Trip; field and/or equipment; and laboratory blank results have all been reported and the detected constituents in these blanks, if any, have been qualified using professional judgement where detected in other samples.

Notes: The following table presents field blank detections and associated samples that have been qualified. In accordance with EPA guidance, associated samples have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification is/is not recommended.

Sample ID	Parameter	Blank Detection (µg/L)	Associated Qualified Sample(s)	Validator Qualifier
Field Blank	Lithium	0.18 J	--	--
Equipment Blank	Lithium	0.18 J	--	--

Yes It is clear from the laboratory report that samples have or have not been diluted during analysis, and if the samples have been diluted, the result is reported as a multiple of the dilution (*e.g.*, a sample diluted 10x resulting in an analytical detection of 1.0 should be reported as 10).

Yes The report provides the reporting limit for each constituent.

Yes The proper reporting limits have been used (*e.g.* NC Solid Waste Section approved PQLs, or VA DEQ Permit approved detection limits, as appropriate).

Notes: _____

7.0 FIELD DUPLICATE PRECISION

Yes Field duplicate sample results were within control limits of 20% relative percent difference for sample results greater than 5 times the quantitation limit. When one or both results were less than 5 times the quantitation limit, the difference between the two results was less than twice the reporting limit.

Notes: The following table presents field duplicates and their associaed parent samples that were not within control limits. In accordance with EPA guidance, sample results with field duplicate imprecison may be qualified estimated (J) or non-detect estimated (UJ). As presented below, data qualification is not recommended.

Parameter	Associated Samples	Parent Sample Result (µg/L)	Duplicate Sample Result (µg/L)	Re-analysis Requested?	Outlier Indentification
--	--	--	--	--	--

APPENDIX C

SECOND SEMI-ANNUAL ASSESSMENT MONITORING PROGRAM EVENT FIELD DATA SHEETS, LABORATORY CERTIFICATES OF ANALYSIS, CHAIN-OF-CUSTODY FORMS, AND DATA VALIDATION FORMS

Date: 10/15/18

GOLDER

WELL GAUGING LOG

Project Name: Bremo PS-North Pond CCR 2SA1B Project No./Task No.: 1789754/B.1004

Sampler(s): B.Dichl

Equipment: WL Indicator

Well ID	Personnel (initials)	Time	DTW (feet)	DTB (feet)	Well Condition Summary				
					Protective Casing	Well Casing	Label	Lock	Pad Condition
MW-11	BD	1118	28.06	51.98	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-24	BD	1326	74.45	156.54	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-25S	BD	1428	42.25	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-26S	BD	1435	53.56	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-27S	BD	1236	37.06	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-27D	BD	1223	35.76	>200	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-28	BD	1455	36.85	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-29D	BD	0954	44.32	159.12	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-29S	BD	1035	42.21	74.60	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-33	BD	1450	90.75	135.13	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-34	BD	1446	103.79	153.75	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-35	BD	1442	108.97	138.96	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
OW-25D	BD	1430	41.30	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
OW-26D	BD	1437	53.15	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
OW-32S	BD	1500	2.35	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
OW-32D	BD	1502	15.58	—	☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
					☐ OK ☐ Damaged	☐ OK ☐ Damaged	☐ OK ☐ Inadequate	☐ Yes ☐ No	☐ OK ☐ Damaged

Observations/Notes: _____

Signature: _____ Date: 10/15/18

QA/QC Signature: Moira Naylor Date: 10/16/18

MICROPURGE SAMPLING LOG

GOLDER

Date: 10/15/18
Weather: cloudy, 60s

Project Name: Bremo PS
Project No./Task No.: 1789754/18.1001
Event: 2SA18 North Pond CCR
Sampler(s): B. Diehl
Well ID: MW-11
Field Calibration Completed: 0800 on 10/15/18
Well Diameter: 2 inches
Initial Depth to Water: 28.06 feet
Depth to Bottom: 51.98 feet
Water Column Thickness: 23.92 feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI 15J103602
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [ ]

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)°C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1122	5.88	222.3	1.3	6.69	15.8	118.1	29.00	300
1127	5.51	217.3	4.8	5.21	15.1	158.1	29.52	300
1132	5.41	217.2	4.2	4.91	15.0	170.9	29.60	300
1137	5.36	217.1	5.0	4.66	15.0	184.8	29.65	300
1142	5.35	217.4	5.9	4.56	15.0	186.4	29.69	300
1147	5.32	218.0	6.0	4.42	15.0	190.7	29.73	300
1149	SAMPLED							
1209	5.30	220.6	6.9	4.35	15.0	195.4	29.74	300

Purge Cycle (End): 24/6 sec @ 30 psi
Flow Rate (ml/min End): 300

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.30

Total Purge Volume (Gallons): ~2.0
Purge Water Management: On site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample

DTP: 44.85 ft *Sampled Duplicate @ ~~1205~~ 1155

Sample Time: 1149
Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: CCR App. III and IV detects, Cyanide, Sulfide

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature]
Date: 10/15/18
Page 1 of 1

QA/QC Signature: Moira Taylor
Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/15/18

Weather: Sunny, 70's

Project Name: Bremo PS

Project No./Task No.: 1780754/B.1001

Event: 2018 North Pond CCR

Sampler(s): B. Diehl

Well ID: MW-24

Field Calibration Completed: 0900 on 10/15/18

Well Diameter: 2 inches

Initial Depth to Water: 74.45 feet

Depth to Bottom: 156.54 feet

Water Column Thickness: 82.09 feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [x] YSI Pro DSS 16J102602
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ _____
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1338	7.00	674	14.4	0.69	16.2	-119.0	79.53	400
1343	7.18	673	4.1	0.63	16.2	-142.5	80.70	400
1348	7.32	646	4.5	0.52	16.1	-156.4	81.46	400
1353	7.37	636	7.4	0.47	16.1	-161.1	81.94	400
1358	7.40	630	1.6	0.44	16.1	-162.4	82.26	400
1400	SAMPLED							
1425	7.45	616	2.9	0.35	16.1	-164.6	84.90	400

Purge Cycle (End): 20/10 @ 60 psi Flow Rate (ml/min End): 400

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.90

Total Purge Volume (Gallons): ~3.0 Purge Water Management: on site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample

DTP: 148.81 ft

Sample Time: 1400 Field Filtered (0.45um): [ ] Yes [x] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [x] Other: CCR App. III and IV constituents → detects

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/15/18 Page 1 of 1

QA/QC Signature: Mona Taylor Date: 10/17/18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/15/18
Weather: Sunny, 70's

Project Name: Bremo PS
Project No./Task No.: 17887548.1004
Event: 2SA 18 North Pond CCR
Sampler(s): R. Diehl
Well ID: MW-27D
Field Calibration Completed: 0900 on 10/15/18
Well Diameter: 2 inches
Initial Depth to Water: 35.76 feet
Depth to Bottom: 200+ feet
Water Column Thickness: — feet

Equipment Used: ☒ WL Indicator ☐ Turbidity Meter ☐ Air Tank ☒ Dedicated Bladder Pump
☒ YSI Pro DSS 15J103602 ☐ Peristaltic Pump ☐ Compressor ☐ Non-dedicated BP
☐ In-Situ ☐ MP-10 Controller Box ☒ MP-15 Controller Box ☐

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1241	6.86	1589	1.4	0.92	16.4	-68.9	43.70	~250
1246	6.67	1515	7.8	1.00	16.5	-34.7	46.56	250
1251	6.53	1450	1.1	0.91	16.5	-9.2	48.30	250
1256	6.46	1405	1.1	0.75	16.4	14.2	50.35	250
1301	6.45	1391	1.2	0.96	16.4	20.7	51.52	250
1306	6.43	1380	1.1	0.76	16.4	22.9	53.80	250
1308	SAMPLED							
1320	6.40	1371	1.6	0.74	16.4	27.0	56.89	250

Purge Cycle (End): 4/13 @ 105 psi
Flow Rate (ml/min End): 250
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~1.25
Total Purge Volume (Gallons): ~3.0
Purge Water Management: on site containment
Purge Observations (color, odor, turbidity, sheen): Clear grab sample
DTP: 198.36 ft

Sample Time: 1308
Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s): ☐ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals
☐ VSWMR Table 3.1 Column B
☒ Other: CCR Appendix III, and IV detects

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature]
Date: 10/15/18
Page 1 of 1
QA/QC Signature: Moira Taylor
Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/15/18

Weather: cloudy, 60's

Project Name: Bremo PS

Project No./Task No.: 1789754/8.1001

Event: 2S18 North Pond CCR

Sampler(s): B. Diehl

Well ID: MW-29S

Field Calibration Completed: 0900 on 10/15/18

Well Diameter: 2 inches

Initial Depth to Water: 42.21 feet

Depth to Bottom: 74.60 feet

Water Column Thickness: 32.39 feet

Equipment Used:
- [X] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [X] YSI Pro DSS 17J107602
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [ ] In-Situ _____
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1039	5.53	343.9	10.5	5.22	15.0	97.4	43.01	300
1044	5.67	349.4	12.3	4.83	14.9	113.5	43.15	300
1049	5.68	347.3	10.4	4.81	14.8	116.1	43.16	300
1054	5.70	349.1	6.3	4.79	14.9	126.7	43.16	300
1056	SAMPLED							
1103	5.71	351.6	6.4	4.75	14.9	130.4	43.16	300

Purge Cycle (End): 22/8 sec @ 40 psi Flow Rate (ml/min End): 300

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.40

Total Purge Volume (Gallons): ~1.5 Purge Water Management: On site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample

DTP: 65.30 ft

Sample Time: 1056 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other: CCR App. III and IV → detects, Cyanide, sulfide

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/15/18

QA/QC Signature: Moira Taylor Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/15/18

Weather: cloudy, 60's

Project Name: Bremo PS

Project No./Task No.: 1709754/8.100A

Event: North Pond CCR 2S+1B

Sampler(s): R. Diehl

Well ID: MW-290

Field Calibration Completed: 0900 on 10/15/18

Well Diameter: 2 inches

Initial Depth to Water: 44.32 feet

Depth to Bottom: 159.12 feet

Water Column Thickness: ~~159.12~~ 114.80 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 15J103002
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [X] MP-15 Controller Box
- [X] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm) °C	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1001	6.90	940	12.9	1.76	14.7	-91.4	49.52	300
1006	6.98	945	15.6	2.44	14.6	-109.1	52.80	300
1011	6.98	931	14.9	2.61	14.8	-114.5	54.20	300
1016	7.01	934	10.8	2.91	14.9	-119.3	54.69	300
1021	6.99	920	9.4	2.75	15.0	-112.8	54.98	300
1023	SAMPLED							
1034	6.95	914	8.6	2.61	15.0	-105.3	55.76	300

Purge Cycle (End): 22/8 sec @ 45 psi Flow Rate (ml/min End): 300

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.95

Total Purge Volume (Gallons): ~2.0 Purge Water Management: on site containment

Purge Observations (color, odor, turbidity, sheen): clear grab sample

DTP: 159.40'

Sample Time: 1023 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other: CCR App. III and IV, Cyanide, sulfide (make-up event) → detects

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: ~~10/15/18~~ 10/15/18 Page 1 of 1

QA/QC Signature: Moira Taylor Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/16/18

Weather: Sunny, 60s

Project Name: Bremo PS

Project No./Task No.: 1789754/8.1004

Event: 2Q18 North Pond CCR

Sampler(s): B. Diehl

Well ID: MW-33

Field Calibration Completed: 0900 on 10/16/18

Well Diameter: 2 inches

Initial Depth to Water: 90.72 feet

Depth to Bottom: 135.12 feet

Water Column Thickness: 44.40 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS 15T103602
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [X] MP-15 Controller Box
- [X] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
0950	6.41	596	1.7	6.34	16.5	76.1	92.15	100
0955	6.40	634	2.0	4.87	16.4	42.3	92.30	100
1000	6.43	673	3.1	3.62	16.3	30.7	92.51	100
1005	6.45	683	3.3	3.30	16.3	27.4	92.80	100
1010	6.47	695	3.4	2.91	16.3	24.7	92.98	100
1015	6.49	700	3.5	2.66	16.3	21.4	93.16	100
1017	SAMPLED							
1117	6.59	736	3.5	1.95	16.2	11.6	95.99	100

Purge Cycle (End): 40/20 @ 105 psi Flow Rate (ml/min End): 100

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.80

Total Purge Volume (Gallons): ~1.5 Purge Water Management: on site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample

DTP: 139.85 ft

Sample Time: 1017 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other: CCR App. III, and IV detects

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/16/18

QA/QC Signature: Moira Taylor Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/16/18

Weather: cloudy, 60's

Project Name: Bremo PS

Project No./Task No.: 1789754/4.1004

Event: 2018 North Pond CCR

Sampler(s): R. Diehl

Well ID: MW-34

Field Calibration Completed: 0900 on 10/16/18

Well Diameter: 2 inches

Initial Depth to Water: 103.75 feet

Depth to Bottom: 153.75 feet

Water Column Thickness: 50.00 feet

Equipment Used: [X] WL Indicator [ ] Turbidity Meter [ ] Air Tank [X] Dedicated Bladder Pump

[X] YSI Pro DSS 15T(0300) [ ] Peristaltic Pump [ ] Compressor [ ] Non-dedicated BP

[ ] In-Situ _____ [ ] MP-10 Controller Box [X] MP-15 Controller Box [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1127	6.05	375.0	11.4	1.32	14.9	474.5	104.35	400
1132	6.00	374.0	9.1	1.19	14.7	534.0	104.52	400
1137	5.98	374.4	8.6	1.07	14.7	538.2	104.60	400
1142	5.97	373.5	7.4	1.07	14.7	541.6	104.70	400
1144	SAMPLED							
1155	5.95	373.0	7.4	1.05	14.7	547.6	104.75	400

Purge Cycle (End): ~~@ 20/8 22/8~~ @ 85 psi Flow Rate (ml/min End): 400

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.90

Total Purge Volume (Gallons): ~2.5 Purge Water Management: on site containment

Purge Observations (color, odor, turbidity, sheen): clear grab sample

DTP: 148.20 ft

Sample Time: 1144 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s): [ ] VSWMR Table 3.1 Column A VOCs [ ] VSWMR Table 3.1 Column A Metals

[ ] VSWMR Table 3.1 Column B

[X] Other: CCR App III and IV

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/16/18 Page 1 of 1

QA/QC Signature: Moira Mayfield Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/16/18

Weather: Cloudy, 60's

Project Name: Bremo PS

Project No./Task No.: 1789754/18.1001

Event: 2S+1B North Pond CCR

Sampler(s): B. Diehl

Well ID: MW-35

Field Calibration Completed: 0900 on 10/16/18

Well Diameter: 2 inches

Initial Depth to Water: 108.95 feet

Depth to Bottom: 138.96 feet

Water Column Thickness: 30.01 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI Pro DSS #17J08600
- [ ] In-Situ _____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [X] MP-15 Controller Box
- [X] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [ ] _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1205	6.93	462.2	33.5	2.21	15.1	-45.0	109.24	200
1210	7.16	463.8	38.1	1.56	15.2	-117.8	109.26	200
1215	7.21	464.5	15.0	1.35	15.2	-124.7	109.26	200
1220	7.22	464.7	10.8	1.16	15.2	-127.5	109.26	200
1225	7.22	464.1	8.6	1.26	15.2	-126.5	109.26	200
1228	Sampled							
1238	7.20	463.2	7.5	1.09	15.5	-122.0	109.26	200

Purge Cycle (End): 48/12 @ 75 psi Flow Rate (ml/min End): 200

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): 10.80

Total Purge Volume (Gallons): ~ 12.0 Purge Water Management: on site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample

DTP: 138.96 ft

Sample Time: 1228 Field Filtered (0.45um): [ ] Yes [X] No

Sample Parameters/Analyte(s):
- [ ] VSWMR Table 3.1 Column A VOCs
- [ ] VSWMR Table 3.1 Column A Metals
- [ ] VSWMR Table 3.1 Column B
- [X] Other: CCR App. III and IV detects

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/16/18

QA/QC Signature: Moira Taylor Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10/15/18

Weather: Cloudy, 60's

Project Name: Bremo PS

Project No./Task No.: 1784754/8.100A

Event: 2SA18 North And CCR

Sampler(s): B. Diehl

Well ID: Duplicate

Field Calibration Completed: —

Well Diameter: — inches

Initial Depth to Water: — feet

Depth to Bottom: — feet

Water Column Thickness: — feet

Equipment Used: ☐ WL Indicator ☐ Turbidity Meter ☐ Air Tank ☐ Dedicated Bladder Pump

☐ YSI _____ ☐ Peristaltic Pump ☐ Compressor ☐ Non-dedicated BP

☐ In-Situ _____ ☐ MP-10 Controller Box ☐ MP-15 Controller Box ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1155	SAMPLED							

Purge Cycle (End): — @ — psi Flow Rate (ml/min End): —

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —

Total Purge Volume (Gallons): — Purge Water Management: —

Purge Observations (color, odor, turbidity, sheen): Clear grab sample, taken at MW-11

Sample Time: 1155 Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s): ☐ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals

☐ VSWMR Table 3.1 Column B

☒ Other: CCR App III and IV detects

Other Observations / Equipment Operation Problems:

Sampler Signature: _____ Date: 10/15/18 Page 1 of 1

QA/QC Signature: Moira Taylor Date: 10-17-18

GOLDER

MICROPURGE SAMPLING LOG

Date: 10-16-18

Weather: cloudy, 60s

Project Name: Bremo P.S. | Project No./Task No.: ~~1520~~ MT 1789754 18.100A

Event: North Pond CCR | Sampler(s): M. Taylor, B. Diehl

Well ID: Equipment Blank | Field Calibration Completed: —

Well Diameter: — inches | Initial Depth to Water: — feet

Depth to Bottom: — feet | Water Column Thickness: — feet

Equipment Used: ☒ WL Indicator ☐ Turbidity Meter ☐ Air Tank ☐ Dedicated Bladder Pump

☐ YSI _____ ☐ Peristaltic Pump ☐ Compressor ☐ Non-dedicated BP

☐ In-Situ _____ ☐ MP-10 Controller Box ☐ MP-15 Controller Box ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1^{o}C	+/- 10 mV	<0.3 feet	<500
1215	—	—	SAMPLED		—	—	—	—

Purge Cycle (End): — @ — psi | Flow Rate (ml/min End): —

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —

Total Purge Volume (Gallons): — | Purge Water Management: —

Purge Observations (color, odor, turbidity, sheen): clear grab sample taken near MW-33 using WL indicator and lab supplied DI water

Sample Time: 1215 | Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s): ☐ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals ☐ VSWMR Table 3.1 Column B ☒ Other: CCR appendix ~~III~~, + IV detects

Other Observations / Equipment Operation Problems: ~~clear~~ EMT

Sampler Signature: Moira Taylor | Date: 10-16-18 | Page 1 of 1

QA/QC Signature: _____ | Date: 10/16/18

MICROPURGE SAMPLING LOG

GOLDER

Date: 10-16-18

Weather: overcast, 60s

Project Name: Bremo P.S. | Project No./Task No.: 1789-75418.100A ~~1520347.100A~~ MT

Event: North Pond CCR | Sampler(s): M. Taylor / B. Diehl

Well ID: North Pond - Field Blank | Field Calibration Completed: —

Well Diameter: — inches | Initial Depth to Water: — feet

Depth to Bottom: — feet | Water Column Thickness: — feet

Equipment Used: ☐ WL Indicator ☐ Turbidity Meter ☐ Air Tank ☐ Dedicated Bladder Pump

☐ YSI _____ ☐ Peristaltic Pump ☐ Compressor ☐ Non-dedicated BP

☐ In-Situ _____ ☐ MP-10 Controller Box ☐ MP-15 Controller Box ☐ _____

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. (^{o}C)	ORP (mV)	DTW (feet)	Flow Rate (mL/min)
Stabilization	+/- 0.1	+/- 3%	if >10, +/- 10%	+/- 10%	+/- 1°C	+/- 10 mV	<0.3 feet	<500
1205	—	SAMPLED						

Purge Cycle (End): — @ — psi Flow Rate (ml/min End): —

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): —

Total Purge Volume (Gallons): — Purge Water Management: —

Purge Observations (color, odor, turbidity, sheen): clear grab sample taken near MW-33 using lab-supplied DI water

Sample Time: 1205 Field Filtered (0.45um): ☐ Yes ☒ No

Sample Parameters/Analyte(s): ☐ VSWMR Table 3.1 Column A VOCs ☐ VSWMR Table 3.1 Column A Metals

☐ VSWMR Table 3.1 Column B

☒ Other: CCR Appendix III, and IV (Reporting group A)
↳ detects

Other Observations / Equipment Operation Problems:

Sampler Signature: Moira Taylor Date: 10-16-18 Page 1 of 1

QA/QC Signature: Date: 10/16/18

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

January 30, 2019

Mike Williams
Golder Associates
2108 W Laburnum Ave
Suite 200
Richmond, VA 23227

RE: Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Dear Mike Williams:
Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revision was issued on 11/26/18 to report re-analyses results, per client request.

This revision was issued on 1/30/19 to remove the N2 qualifier on Lithium.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
(704)875-9092
Project Manager

Enclosures

cc: Craig LaCosse, Golder Associates Inc.
Rachel Powell, Golder Associates
Amanda Reynolds, Golder Associates
Martha Smith, Golder Associates Inc.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Minnesota Certification IDs

1700 Elm Street SE, Minneapolis, MN 55414-2485
A2LA Certification #: 2926.01
Alabama Certification #: 40770
Alaska Contaminated Sites Certification #: 17-009
Alaska DW Certification #: MN00064
Arizona Certification #: AZ0014
Arkansas DW Certification #: MN00064
Arkansas WW Certification #: 88-0680
California Certification #: 2929
CNMI Saipan Certification #: MP0003
Colorado Certification #: MN00064
Connecticut Certification #: PH-0256
EPA Region 8+Wyoming DW Certification #: via MN 027-053-137
Florida Certification #: E87605
Georgia Certification #: 959
Guam EPA Certification #: MN00064
Hawaii Certification #: MN00064
Idaho Certification #: MN00064
Illinois Certification #: 200011
Indiana Certification #: C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky DW Certification #: 90062
Kentucky WW Certification #: 90062
Louisiana DEQ Certification #: 03086
Louisiana DW Certification #: MN00064
Maine Certification #: MN00064
Maryland Certification #: 322
Massachusetts Certification #: M-MN064
Michigan Certification #: 9909
Minnesota Certification #: 027-053-137
Minnesota Dept of Ag Certifcation #: via MN 027-053-137
Minnesota Petrofund Certification #: 1240
Mississippi Certification #: MN00064
Montana Certification #: CERT0092
Nebraska Certification #: NE-OS-18-06
Nevada Certification #: MN00064
New Hampshire Certification #: 2081
New Jersey Certification #: MN002
New York Certification #: 11647
North Carolina DW Certification #: 27700
North Carolina WW Certification #: 530
North Dakota Certification #: R-036
Ohio DW Certification #: 41244
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon NwTPH Certification #: MN300001
Oregon Secondary Certification #: MN200001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification #: MN00064
South Carolina Certification #:74003001
Tennessee Certification #: TN02818
Texas Certification #: T104704192
Utah Certification #: MN00064
Virginia Certification #: 460163
Washington Certification #: C486
West Virginia DW Certification #: 9952 C
West Virginia DEP Certification #: 382
Wisconsin Certification #: 999407970
Wyoming UST Certification #: via A2LA 2926.01

Pennsylvania Certification IDs

1638 Roseytown Rd Suites 2,3&4, Greensburg, PA 15601
ANAB DOD-ELAP Rad Accreditation #: L2417
Alabama Certification #: 41590
Arizona Certification #: AZ0734
Arkansas Certification
California Certification #: 04222CA
Colorado Certification #: PA01547
Connecticut Certification #: PH-0694
Delaware Certification
EPA Region 4 DW Rad
Florida/TNI Certification #: E87683
Georgia Certification #: C040
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Pennsylvania Certification IDs

North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
Pennsylvania/TNI Certification #: 65-00282
Puerto Rico Certification #: PA01457
Rhode Island Certification #: 65-00282
South Dakota Certification
Tennessee Certification #: 02867
Texas/TNI Certification #: T104704188-17-3
Utah/TNI Certification #: PA014572017-9
USDA Soil Permit #: P330-17-00091
Vermont Dept. of Health: ID# VT-0282
Virgin Island/PADEP Certification
Virginia/VELAP Certification #: 9526
Washington Certification #: C868
West Virginia DEP Certification #: 143
West Virginia DHHR Certification #: 9964C
Wisconsin Approve List for Rad
Wyoming Certification #: 8TMS-L

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

SAMPLE SUMMARY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92403741001	**MW-11**	Water	10/15/18 11:49	10/17/18 09:55
92403741002	**MW-29S**	Water	10/15/18 10:56	10/17/18 09:55
92403741003	**MW-29D**	Water	10/15/18 10:23	10/17/18 09:55
92403741004	**MW-24**	Water	10/15/18 14:00	10/17/18 09:55
92403741005	**MW-27D**	Water	10/15/18 13:08	10/17/18 09:55
92403741006	**MW-33**	Water	10/16/18 10:17	10/17/18 09:55
92403741007	**MW-34**	Water	10/16/18 11:44	10/17/18 09:55
92403741008	**MW-35**	Water	10/16/18 12:28	10/17/18 09:55
92403741009	**Field Blank**	Water	10/16/18 12:05	10/17/18 09:55
92403741010	**Equipment Blank**	Water	10/16/18 12:15	10/17/18 09:55
92403741011	**Duplicate**	Water	10/15/18 11:55	10/17/18 09:55
92403741012	**MW-24 - Rerun**	Water	10/15/18 14:00	10/17/18 09:55
92403741013	**MW-35 - Rerun**	Water	10/16/18 12:28	10/17/18 09:55

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
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(704)875-9092

SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92403741001	**MW-11**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741002	**MW-29S**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741003	**MW-29D**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741004	**MW-24**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741005	**MW-27D**	EPA 6010D	SER	6	PASI-A

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741006	**MW-33**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741007	**MW-34**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741008	**MW-35**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741009	**Field Blank**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741010	**Equipment Blank**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CEH	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741011	**Duplicate**	EPA 6010D	SER	6	PASI-A
		EPA 6020B	SER	1	PASI-A
		EPA 6020A	BWB	1	PASI-M
		EPA 7470A	JMW1	1	PASI-A
		EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	JLW	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		SM 2540C-2011	CRV	1	PASI-A
		EPA 300.0 Rev 2.1 1993	CDC	3	PASI-A
92403741012	**MW-24 - Rerun**	EPA 6010D	KQ	1	PASI-A
92403741013	**MW-35 - Rerun**	EPA 6020B	SER	1	PASI-A

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SUMMARY OF DETECTION

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92403741001	**MW-11**					
EPA 6010D	Barium	2.8J	ug/L	5.0	10/22/18 03:40	
EPA 6010D	Calcium	19.6	mg/L	0.10	10/22/18 03:40	
EPA 6020B	Lithium	0.43J	ug/L	2.5	10/24/18 19:09	
EPA 6020A	Cobalt	0.42J	ug/L	0.50	10/25/18 16:21	
EPA 903.1	Radium-226	0.586 ± 0.589 (0.919) C:NA T:88%	pCi/L		11/01/18 20:59	
EPA 904.0	Radium-228	0.787 ± 0.358 (0.585) C:82% T:90%	pCi/L		10/31/18 12:52	
Total Radium Calculation	Total Radium	1.37 ± 0.947 (1.50)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	145	mg/L	25.0	10/18/18 16:59	
EPA 300.0 Rev 2.1 1993	Chloride	10.2	mg/L	1.0	10/20/18 02:48	
EPA 300.0 Rev 2.1 1993	Sulfate	6.5	mg/L	1.0	10/20/18 02:48	
92403741002	**MW-29S**					
EPA 6010D	Barium	59.0	ug/L	5.0	10/22/18 03:43	
EPA 6010D	Calcium	23.8	mg/L	0.10	10/22/18 03:43	
EPA 6020B	Lithium	0.77J	ug/L	2.5	10/24/18 19:11	
EPA 6020A	Cobalt	0.82	ug/L	0.50	10/25/18 16:24	
EPA 903.1	Radium-226	0.0626 ± 0.368 (0.752) C:NA T:87%	pCi/L		11/01/18 20:59	
EPA 904.0	Radium-228	0.471 ± 0.346 (0.673) C:80% T:86%	pCi/L		10/31/18 12:52	
Total Radium Calculation	Total Radium	0.534 ± 0.714 (1.43)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	250	mg/L	25.0	10/18/18 17:00	
EPA 300.0 Rev 2.1 1993	Chloride	45.5	mg/L	1.0	10/20/18 03:05	
EPA 300.0 Rev 2.1 1993	Sulfate	49.4	mg/L	1.0	10/20/18 03:05	
92403741003	**MW-29D**					
EPA 6010D	Barium	33.2	ug/L	5.0	10/22/18 03:46	
EPA 6010D	Boron	0.045J	mg/L	0.050	10/22/18 03:46	
EPA 6010D	Calcium	52.5	mg/L	0.10	10/22/18 03:46	
EPA 6020B	Lithium	2.1J	ug/L	2.5	10/24/18 19:14	
EPA 6020A	Cobalt	0.76	ug/L	0.50	10/25/18 16:26	
EPA 903.1	Radium-226	0.705 ± 0.553 (0.769) C:NA T:84%	pCi/L		11/01/18 20:59	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92403741003	**MW-29D**					
EPA 904.0	Radium-228	0.564 ± 0.547 (1.13) C:77% T:85%	pCi/L		10/31/18 15:59	
Total Radium Calculation	Total Radium	1.27 ± 1.10 (1.90)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	559	mg/L	25.0	10/18/18 17:00	
EPA 300.0 Rev 2.1 1993	Chloride	63.4	mg/L	1.0	10/20/18 03:23	
EPA 300.0 Rev 2.1 1993	Fluoride	0.11	mg/L	0.10	10/20/18 03:23	
EPA 300.0 Rev 2.1 1993	Sulfate	112	mg/L	2.0	10/20/18 15:16	
92403741004	**MW-24**					
EPA 6010D	Barium	60.0	ug/L	5.0	10/22/18 03:55	
EPA 6010D	Boron	0.16	mg/L	0.050	10/22/18 03:55	
EPA 6010D	Calcium	49.6	mg/L	0.10	10/22/18 03:55	M1
EPA 6010D	Molybdenum	25.6	ug/L	5.0	10/22/18 03:55	
EPA 6020B	Lithium	1.6J	ug/L	2.5	10/24/18 19:17	
EPA 6020A	Cobalt	1.1	ug/L	0.50	10/25/18 16:32	
EPA 903.1	Radium-226	0.586 ± 0.530 (0.782) C:NA T:93%	pCi/L		11/01/18 20:59	
EPA 904.0	Radium-228	1.41 ± 0.638 (1.07) C:75% T:86%	pCi/L		10/31/18 15:59	
Total Radium Calculation	Total Radium	2.00 ± 1.17 (1.85)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	311	mg/L	25.0	10/18/18 17:00	
EPA 300.0 Rev 2.1 1993	Chloride	42.0	mg/L	1.0	10/20/18 03:40	
EPA 300.0 Rev 2.1 1993	Fluoride	0.079J	mg/L	0.10	10/20/18 03:40	
EPA 300.0 Rev 2.1 1993	Sulfate	32.8	mg/L	1.0	10/20/18 03:40	
92403741005	**MW-27D**					
EPA 6010D	Barium	23.9	ug/L	5.0	10/22/18 04:07	
EPA 6010D	Boron	1.3	mg/L	0.050	10/22/18 04:07	
EPA 6010D	Calcium	68.2	mg/L	0.10	10/22/18 04:07	
EPA 6010D	Molybdenum	8.2	ug/L	5.0	10/22/18 04:07	
EPA 6020B	Lithium	51.0	ug/L	2.5	10/24/18 19:27	
EPA 6020A	Cobalt	0.13J	ug/L	0.50	10/25/18 17:13	
EPA 903.1	Radium-226	0.178 ± 0.387 (0.714) C:NA T:91%	pCi/L		11/01/18 20:59	
EPA 904.0	Radium-228	1.25 ± 0.486 (0.744) C:75% T:92%	pCi/L		10/31/18 15:59	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92403741005	**MW-27D**					
Total Radium Calculation	Total Radium	1.43 ± 0.873 (1.46)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	876	mg/L	50.0	10/19/18 15:49	
EPA 300.0 Rev 2.1 1993	Chloride	14.8	mg/L	1.0	10/20/18 04:31	
EPA 300.0 Rev 2.1 1993	Fluoride	0.15	mg/L	0.10	10/20/18 04:31	
EPA 300.0 Rev 2.1 1993	Sulfate	302	mg/L	6.0	10/20/18 15:33	
92403741006	**MW-33**					
EPA 6010D	Barium	37.3	ug/L	5.0	10/22/18 04:11	
EPA 6010D	Boron	0.22	mg/L	0.050	10/22/18 04:11	
EPA 6010D	Calcium	93.7	mg/L	0.10	10/22/18 04:11	
EPA 6010D	Molybdenum	4.6J	ug/L	5.0	10/22/18 04:11	
EPA 6020B	Lithium	1.6J	ug/L	2.5	10/24/18 19:35	
EPA 6020A	Cobalt	0.25J	ug/L	0.50	10/25/18 17:19	
EPA 903.1	Radium-226	0.714 ± 0.646 (0.953) C:NA T:72%	pCi/L		11/01/18 20:59	
EPA 904.0	Radium-228	0.894 ± 0.482 (0.877) C:75% T:87%	pCi/L		10/31/18 15:59	
Total Radium Calculation	Total Radium	1.61 ± 1.13 (1.83)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	385	mg/L	25.0	10/19/18 01:00	
EPA 300.0 Rev 2.1 1993	Chloride	22.3	mg/L	1.0	10/20/18 04:48	
EPA 300.0 Rev 2.1 1993	Fluoride	0.065J	mg/L	0.10	10/20/18 04:48	
EPA 300.0 Rev 2.1 1993	Sulfate	47.0	mg/L	1.0	10/20/18 04:48	
92403741007	**MW-34**					
EPA 6010D	Barium	44.2	ug/L	5.0	10/22/18 04:14	
EPA 6010D	Boron	1.2	mg/L	0.050	10/22/18 04:14	
EPA 6010D	Calcium	36.8	mg/L	0.10	10/22/18 04:14	
EPA 6020B	Lithium	7.1	ug/L	2.5	10/24/18 19:38	
EPA 7470A	Mercury	0.46	ug/L	0.20	10/23/18 12:51	
EPA 903.1	Radium-226	0.432 ± 0.471 (0.741) C:NA T:84%	pCi/L		11/01/18 21:13	
EPA 904.0	Radium-228	0.132 ± 0.384 (0.859) C:75% T:88%	pCi/L		10/31/18 16:00	
Total Radium Calculation	Total Radium	0.564 ± 0.855 (1.60)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	254	mg/L	25.0	10/19/18 01:00	
EPA 300.0 Rev 2.1 1993	Chloride	14.0	mg/L	1.0	10/20/18 05:05	
EPA 300.0 Rev 2.1 1993	Fluoride	0.054J	mg/L	0.10	10/20/18 05:05	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92403741007	**MW-34**					
EPA 300.0 Rev 2.1 1993	Sulfate	27.5	mg/L	1.0	10/20/18 05:05	
92403741008	**MW-35**					
EPA 6010D	Barium	101	ug/L	5.0	10/22/18 04:17	
EPA 6010D	Boron	0.41	mg/L	0.050	10/22/18 04:17	
EPA 6010D	Calcium	48.1	mg/L	0.10	10/22/18 04:17	
EPA 6020B	Lithium	54.8	ug/L	2.5	10/24/18 19:40	
EPA 6020A	Cobalt	0.22J	ug/L	0.50	10/25/18 17:39	
EPA 903.1	Radium-226	1.56 ± 0.727 (0.751) C:NA T:91%	pCi/L		11/01/18 21:13	
EPA 904.0	Radium-228	-0.290 ± 0.546 (1.33) C:69% T:87%	pCi/L		10/31/18 19:34	
Total Radium Calculation	Total Radium	1.56 ± 1.27 (2.08)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	303	mg/L	25.0	10/19/18 01:00	
EPA 300.0 Rev 2.1 1993	Chloride	10.5	mg/L	1.0	10/20/18 05:22	
EPA 300.0 Rev 2.1 1993	Sulfate	34.6	mg/L	1.0	10/20/18 05:22	
92403741009	**Field Blank**					
EPA 6020B	Lithium	0.096J	ug/L	2.5	10/24/18 19:43	
EPA 903.1	Radium-226	0.262 ± 0.482 (0.859) C:NA T:87%	pCi/L		11/01/18 21:13	
EPA 904.0	Radium-228	0.343 ± 0.455 (0.966) C:75% T:83%	pCi/L		10/31/18 19:36	
Total Radium Calculation	Total Radium	0.605 ± 0.937 (1.83)	pCi/L		11/05/18 15:44	
92403741010	**Equipment Blank**					
EPA 6010D	Barium	5.0	ug/L	5.0	10/22/18 04:23	
EPA 903.1	Radium-226	0.261 ± 0.480 (0.856) C:NA T:84%	pCi/L		11/01/18 21:13	
EPA 904.0	Radium-228	0.229 ± 0.520 (1.15) C:75% T:89%	pCi/L		10/31/18 19:38	
Total Radium Calculation	Total Radium	0.490 ± 1.000 (2.01)	pCi/L		11/05/18 15:44	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92403741011	**Duplicate**					
EPA 6010D	Barium	3.2J	ug/L	5.0	10/22/18 04:38	
EPA 6010D	Calcium	20.4	mg/L	0.10	10/22/18 04:38	
EPA 6020B	Lithium	0.37J	ug/L	2.5	10/24/18 19:48	
EPA 6020A	Cobalt	0.44J	ug/L	0.50	10/25/18 17:56	
EPA 903.1	Radium-226	0.118 ± 0.401 (0.773) C:NA T:92%	pCi/L		11/01/18 21:13	
EPA 904.0	Radium-228	0.432 ± 0.454 (0.940) C:76% T:100%	pCi/L		10/31/18 19:38	
Total Radium Calculation	Total Radium	0.550 ± 0.855 (1.71)	pCi/L		11/05/18 15:44	
SM 2540C-2011	Total Dissolved Solids	144	mg/L	25.0	10/18/18 17:02	
EPA 300.0 Rev 2.1 1993	Chloride	10.4	mg/L	1.0	10/20/18 07:22	
EPA 300.0 Rev 2.1 1993	Sulfate	6.4	mg/L	1.0	10/20/18 07:22	
92403741012	**MW-24 - Rerun**					
EPA 6010D	Molybdenum	26.0	ug/L	5.0	11/15/18 11:06	
92403741013	**MW-35 - Rerun**					
EPA 6020B	Lithium	53.0	ug/L	2.5	11/14/18 20:25	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-11 **Lab ID: 92403741001** Collected: 10/15/18 11:49 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 03:40	7440-38-2	
Barium	**2.8J**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:40	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 03:40	7440-42-8	
Calcium	**19.6**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 03:40	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:40	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:40	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**0.43J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:09	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.42J**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 16:21	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:27	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**145**	mg/L	25.0	25.0	1		10/18/18 16:59		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**10.2**	mg/L	1.0	0.50	1		10/20/18 02:48	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 02:48	16984-48-8	
Sulfate	**6.5**	mg/L	1.0	0.50	1		10/20/18 02:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-29S **Lab ID: 92403741002** Collected: 10/15/18 10:56 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 03:43	7440-38-2	
Barium	**59.0**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:43	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 03:43	7440-42-8	
Calcium	**23.8**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 03:43	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:43	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:43	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**0.77J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:11	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.82**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 16:24	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:29	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**250**	mg/L	25.0	25.0	1		10/18/18 17:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**45.5**	mg/L	1.0	0.50	1		10/20/18 03:05	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 03:05	16984-48-8	
Sulfate	**49.4**	mg/L	1.0	0.50	1		10/20/18 03:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-29D **Lab ID: 92403741003** Collected: 10/15/18 10:23 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 03:46	7440-38-2	
Barium	**33.2**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:46	7440-39-3	
Boron	**0.045J**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 03:46	7440-42-8	
Calcium	**52.5**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 03:46	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:46	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:46	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**2.1J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:14	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.76**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 16:26	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**559**	mg/L	25.0	25.0	1		10/18/18 17:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**63.4**	mg/L	1.0	0.50	1		10/20/18 03:23	16887-00-6	
Fluoride	**0.11**	mg/L	0.10	0.050	1		10/20/18 03:23	16984-48-8	
Sulfate	**112**	mg/L	2.0	1.0	2		10/20/18 15:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-24 **Lab ID: 92403741004** Collected: 10/15/18 14:00 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 03:55	7440-38-2	
Barium	**60.0**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:55	7440-39-3	
Boron	**0.16**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 03:55	7440-42-8	
Calcium	**49.6**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 03:55	7440-70-2	M1
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:55	7439-92-1	
Molybdenum	**25.6**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 03:55	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**1.6J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:17	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**1.1**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 16:32	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:34	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**311**	mg/L	25.0	25.0	1		10/18/18 17:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**42.0**	mg/L	1.0	0.50	1		10/20/18 03:40	16887-00-6	
Fluoride	**0.079J**	mg/L	0.10	0.050	1		10/20/18 03:40	16984-48-8	
Sulfate	**32.8**	mg/L	1.0	0.50	1		10/20/18 03:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-27D **Lab ID: 92403741005** Collected: 10/15/18 13:08 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:07	7440-38-2	
Barium	**23.9**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:07	7440-39-3	
Boron	**1.3**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:07	7440-42-8	
Calcium	**68.2**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:07	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:07	7439-92-1	
Molybdenum	**8.2**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:07	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**51.0**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:27	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.13J**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:13	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:46	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**876**	mg/L	50.0	50.0	1		10/19/18 15:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**14.8**	mg/L	1.0	0.50	1		10/20/18 04:31	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	0.050	1		10/20/18 04:31	16984-48-8	
Sulfate	**302**	mg/L	6.0	3.0	6		10/20/18 15:33	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-33 **Lab ID: 92403741006** Collected: 10/16/18 10:17 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:11	7440-38-2	
Barium	**37.3**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:11	7440-39-3	
Boron	**0.22**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:11	7440-42-8	
Calcium	**93.7**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:11	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:11	7439-92-1	
Molybdenum	**4.6J**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:11	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**1.6J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:35	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.25J**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:19	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:48	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**385**	mg/L	25.0	25.0	1		10/19/18 01:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**22.3**	mg/L	1.0	0.50	1		10/20/18 04:48	16887-00-6	
Fluoride	**0.065J**	mg/L	0.10	0.050	1		10/20/18 04:48	16984-48-8	
Sulfate	**47.0**	mg/L	1.0	0.50	1		10/20/18 04:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-34 **Lab ID: 92403741007** Collected: 10/16/18 11:44 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:14	7440-38-2	
Barium	**44.2**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:14	7440-39-3	
Boron	**1.2**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:14	7440-42-8	
Calcium	**36.8**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:14	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:14	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:14	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**7.1**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:38	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	ND	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:25	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	**0.46**	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:51	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**254**	mg/L	25.0	25.0	1		10/19/18 01:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**14.0**	mg/L	1.0	0.50	1		10/20/18 05:05	16887-00-6	
Fluoride	**0.054J**	mg/L	0.10	0.050	1		10/20/18 05:05	16984-48-8	
Sulfate	**27.5**	mg/L	1.0	0.50	1		10/20/18 05:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-35 **Lab ID: 92403741008** Collected: 10/16/18 12:28 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:17	7440-38-2	
Barium	**101**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:17	7440-39-3	
Boron	**0.41**	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:17	7440-42-8	
Calcium	**48.1**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:17	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:17	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:17	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**54.8**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:40	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.22J**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:39	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**303**	mg/L	25.0	25.0	1		10/19/18 01:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**10.5**	mg/L	1.0	0.50	1		10/20/18 05:22	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 05:22	16984-48-8	
Sulfate	**34.6**	mg/L	1.0	0.50	1		10/20/18 05:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Field Blank **Lab ID: 92403741009** Collected: 10/16/18 12:05 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:20	7440-38-2	
Barium	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:20	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:20	7440-42-8	
Calcium	ND	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:20	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:20	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:20	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**0.096J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:43	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	ND	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:45	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	ND	mg/L	25.0	25.0	1		10/19/18 15:49		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	ND	mg/L	1.0	0.50	1		10/20/18 06:48	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 06:48	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		10/20/18 06:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Equipment Blank **Lab ID: 92403741010** Collected: 10/16/18 12:15 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:23	7440-38-2	
Barium	**5.0**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:23	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:23	7440-42-8	
Calcium	ND	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:23	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:23	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:23	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	ND	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:45	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	ND	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:51	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 12:58	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	ND	mg/L	25.0	25.0	1		10/19/18 01:00		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	ND	mg/L	1.0	0.50	1		10/20/18 07:05	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 07:05	16984-48-8	
Sulfate	ND	mg/L	1.0	0.50	1		10/20/18 07:05	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(704)875-9092

ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Duplicate **Lab ID: 92403741011** Collected: 10/15/18 11:55 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	10.0	5.0	1	10/20/18 04:21	10/22/18 04:38	7440-38-2	
Barium	**3.2J**	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:38	7440-39-3	
Boron	ND	mg/L	0.050	0.025	1	10/20/18 04:21	10/22/18 04:38	7440-42-8	
Calcium	**20.4**	mg/L	0.10	0.050	1	10/20/18 04:21	10/22/18 04:38	7440-70-2	
Lead	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:38	7439-92-1	
Molybdenum	ND	ug/L	5.0	2.5	1	10/20/18 04:21	10/22/18 04:38	7439-98-7	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**0.37J**	ug/L	2.5	0.070	1	10/20/18 02:45	10/24/18 19:48	7439-93-2	
6020A MET ICPMS	Analytical Method: EPA 6020A Preparation Method: EPA 3020								
Cobalt	**0.44J**	ug/L	0.50	0.085	1	10/22/18 10:42	10/25/18 17:56	7440-48-4	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/19/18 21:06	10/23/18 13:00	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011								
Total Dissolved Solids	**144**	mg/L	25.0	25.0	1		10/18/18 17:02		
300.0 IC Anions 28 Days	Analytical Method: EPA 300.0 Rev 2.1 1993								
Chloride	**10.4**	mg/L	1.0	0.50	1		10/20/18 07:22	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		10/20/18 07:22	16984-48-8	
Sulfate	**6.4**	mg/L	1.0	0.50	1		10/20/18 07:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-24 - Rerun **Lab ID: 92403741012** Collected: 10/15/18 14:00 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Molybdenum	**26.0**	ug/L	5.0	2.5	1	11/14/18 03:20	11/15/18 11:06	7439-98-7	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-35 - Rerun **Lab ID: 92403741013** Collected: 10/16/18 12:28 Received: 10/17/18 09:55 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**53.0**	ug/L	2.5	0.070	1	11/14/18 03:20	11/14/18 20:25	7439-93-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437340 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 2405515 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	10/23/18 12:22	

LABORATORY CONTROL SAMPLE: 2405516

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.7	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405517 2405518

Parameter	Units	92403741004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.6	2.6	102	106	75-125	3	25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437373 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 2405600 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	10.0	5.0	10/22/18 03:34	
Barium	ug/L	ND	5.0	2.5	10/22/18 03:34	
Boron	mg/L	ND	0.050	0.025	10/22/18 03:34	
Calcium	mg/L	ND	0.10	0.050	10/22/18 03:34	
Lead	ug/L	ND	5.0	2.5	10/22/18 03:34	
Molybdenum	ug/L	ND	5.0	2.5	10/22/18 03:34	

LABORATORY CONTROL SAMPLE: 2405601

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	500	468	94	80-120	
Barium	ug/L	500	511	102	80-120	
Boron	mg/L	.5	0.49	99	80-120	
Calcium	mg/L	5	4.9	98	80-120	
Lead	ug/L	500	469	94	80-120	
Molybdenum	ug/L	500	501	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405602 2405603

Parameter	Units	92403741004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	ND	500	500	516	497	103	99	75-125	4	20	
Barium	ug/L	60.0	500	500	610	584	110	105	75-125	4	20	
Boron	mg/L	0.16	.5	.5	0.71	0.68	110	104	75-125	5	20	
Calcium	mg/L	49.6	5	5	57.2	54.6	152	100	75-125	5	20	M1
Lead	ug/L	ND	500	500	494	476	99	95	75-125	4	20	
Molybdenum	ug/L	25.6	500	500	565	542	108	103	75-125	4	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 443637 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92403741012

METHOD BLANK: 2434022 Matrix: Water
Associated Lab Samples: 92403741012

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Molybdenum	ug/L	ND	5.0	2.5	11/15/18 11:00	

LABORATORY CONTROL SAMPLE: 2434023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Molybdenum	ug/L	500	470	94	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437380 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 2405632 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lithium	ug/L	ND	2.5	0.070	10/25/18 22:34	

LABORATORY CONTROL SAMPLE: 2405633

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lithium	ug/L	50	54.6	109	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405634 2405635

Parameter	Units	92403741004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lithium	ug/L	1.6J	50	50	51.6	52.8	100	102	75-125	2	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 443655 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET
Associated Lab Samples: 92403741013

METHOD BLANK: 2434088 Matrix: Water
Associated Lab Samples: 92403741013

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lithium	ug/L	0.072J	2.5	0.070	11/14/18 20:13	

LABORATORY CONTROL SAMPLE: 2434089

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lithium	ug/L	50	50.4	101	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 570608 Analysis Method: EPA 6020A
QC Batch Method: EPA 3020 Analysis Description: 6020A Water UPD4
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 3096323 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.50	0.085	10/25/18 16:15	

LABORATORY CONTROL SAMPLE: 3096324

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	100	116	116	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3096325 3096326

Parameter	Units	92403741004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	1.1	100	100	116	119	115	118	75-125	2	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437042 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741011

METHOD BLANK: 2404175 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	10/18/18 16:59	

LABORATORY CONTROL SAMPLE: 2404176

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	251	244	97	90-110	

SAMPLE DUPLICATE: 2404178

Parameter	Units	92403674001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	13500	13400	1	5	

SAMPLE DUPLICATE: 2404179

Parameter	Units	92403741004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	311	312	0	5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437113 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92403741006, 92403741007, 92403741008, 92403741010

METHOD BLANK: 2404486 Matrix: Water
Associated Lab Samples: 92403741006, 92403741007, 92403741008, 92403741010

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	10/19/18 01:00	

LABORATORY CONTROL SAMPLE: 2404487

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	251	254	101	90-110	

SAMPLE DUPLICATE: 2404488

Parameter	Units	92403671013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

SAMPLE DUPLICATE: 2404489

Parameter	Units	92403741010 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437298 Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 92403741005, 92403741009

METHOD BLANK: 2405186 Matrix: Water
Associated Lab Samples: 92403741005, 92403741009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	10/19/18 15:49	

LABORATORY CONTROL SAMPLE: 2405187

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	251	264	105	90-110	

SAMPLE DUPLICATE: 2405188

Parameter	Units	92403741005 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	876	872	0	5	

SAMPLE DUPLICATE: 2405189

Parameter	Units	92403741009 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	ND	ND		5	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 437285 Analysis Method: EPA 300.0 Rev 2.1 1993
QC Batch Method: EPA 300.0 Rev 2.1 1993 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 2405099 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.50	10/20/18 00:49	
Fluoride	mg/L	ND	0.10	0.050	10/20/18 00:49	
Sulfate	mg/L	ND	1.0	0.50	10/20/18 00:49	

LABORATORY CONTROL SAMPLE: 2405100

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	50.2	100	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Sulfate	mg/L	50	50.7	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405101 2405102

Parameter	Units	92403741004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	42.0	50	50	95.5	96.3	107	108	90-110	1	10	
Fluoride	mg/L	0.079J	2.5	2.5	2.5	2.5	96	98	90-110	1	10	
Sulfate	mg/L	32.8	50	50	86.2	87.0	107	108	90-110	1	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2405103 2405104

Parameter	Units	92403741008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	10.5	50	50	64.9	65.2	109	110	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.5	2.5	97	97	90-110	0	10	
Sulfate	mg/L	34.6	50	50	88.5	88.9	108	109	90-110	0	10	

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REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-11 **Lab ID: 92403741001** Collected: 10/15/18 11:49 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.586 ± 0.589 (0.919) C:NA T:88%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**0.787 ± 0.358 (0.585) C:82% T:90%**	pCi/L	10/31/18 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**1.37 ± 0.947 (1.50)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-29S **Lab ID: 92403741002** Collected: 10/15/18 10:56 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0626 ± 0.368 (0.752) C:NA T:87%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**0.471 ± 0.346 (0.673) C:80% T:86%**	pCi/L	10/31/18 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.534 ± 0.714 (1.43)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-29D **Lab ID: 92403741003** Collected: 10/15/18 10:23 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.705 ± 0.553 (0.769) C:NA T:84%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**0.564 ± 0.547 (1.13) C:77% T:85%**	pCi/L	10/31/18 15:59	15262-20-1	
Total Radium	Total Radium Calculation	**1.27 ± 1.10 (1.90)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-24 **Lab ID: 92403741004** Collected: 10/15/18 14:00 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.586 ± 0.530 (0.782) C:NA T:93%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**1.41 ± 0.638 (1.07) C:75% T:86%**	pCi/L	10/31/18 15:59	15262-20-1	
Total Radium	Total Radium Calculation	**2.00 ± 1.17 (1.85)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-27D **Lab ID: 92403741005** Collected: 10/15/18 13:08 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.178 ± 0.387 (0.714) C:NA T:91%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**1.25 ± 0.486 (0.744) C:75% T:92%**	pCi/L	10/31/18 15:59	15262-20-1	
Total Radium	Total Radium Calculation	**1.43 ± 0.873 (1.46)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-33 **Lab ID: 92403741006** Collected: 10/16/18 10:17 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.714 ± 0.646 (0.953) C:NA T:72%**	pCi/L	11/01/18 20:59	13982-63-3	
Radium-228	EPA 904.0	**0.894 ± 0.482 (0.877) C:75% T:87%**	pCi/L	10/31/18 15:59	15262-20-1	
Total Radium	Total Radium Calculation	**1.61 ± 1.13 (1.83)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-34 **Lab ID: 92403741007** Collected: 10/16/18 11:44 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.432 ± 0.471 (0.741) C:NA T:84%**	pCi/L	11/01/18 21:13	13982-63-3	
Radium-228	EPA 904.0	**0.132 ± 0.384 (0.859) C:75% T:88%**	pCi/L	10/31/18 16:00	15262-20-1	
Total Radium	Total Radium Calculation	**0.564 ± 0.855 (1.60)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: MW-35 **Lab ID: 92403741008** Collected: 10/16/18 12:28 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**1.56 ± 0.727 (0.751) C:NA T:91%**	pCi/L	11/01/18 21:13	13982-63-3	
Radium-228	EPA 904.0	**-0.290 ± 0.546 (1.33) C:69% T:87%**	pCi/L	10/31/18 19:34	15262-20-1	
Total Radium	Total Radium Calculation	**1.56 ± 1.27 (2.08)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Field Blank **Lab ID: 92403741009** Collected: 10/16/18 12:05 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.262 ± 0.482 (0.859) C:NA T:87%**	pCi/L	11/01/18 21:13	13982-63-3	
Radium-228	EPA 904.0	**0.343 ± 0.455 (0.966) C:75% T:83%**	pCi/L	10/31/18 19:36	15262-20-1	
Total Radium	Total Radium Calculation	**0.605 ± 0.937 (1.83)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Equipment Blank **Lab ID: 92403741010** Collected: 10/16/18 12:15 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.261 ± 0.480 (0.856) C:NA T:84%**	pCi/L	11/01/18 21:13	13982-63-3	
Radium-228	EPA 904.0	**0.229 ± 0.520 (1.15) C:75% T:89%**	pCi/L	10/31/18 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**0.490 ± 1.000 (2.01)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Sample: Duplicate **Lab ID: 92403741011** Collected: 10/15/18 11:55 Received: 10/17/18 09:55 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.118 ± 0.401 (0.773) C:NA T:92%**	pCi/L	11/01/18 21:13	13982-63-3	
Radium-228	EPA 904.0	**0.432 ± 0.454 (0.940) C:76% T:100%**	pCi/L	10/31/18 19:38	15262-20-1	
Total Radium	Total Radium Calculation	**0.550 ± 0.855 (1.71)**	pCi/L	11/05/18 15:44	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 317792 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 1550383 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.473 ± 0.371 (0.435) C:NA T:95%	pCi/L	11/01/18 20:42	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

QC Batch: 317795 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

METHOD BLANK: 1550392 Matrix: Water
Associated Lab Samples: 92403741001, 92403741002, 92403741003, 92403741004, 92403741005, 92403741006, 92403741007, 92403741008, 92403741009, 92403741010, 92403741011

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.687 ± 0.358 (0.635) C:81% T:89%	pCi/L	10/31/18 12:28	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty: SDWA = 1.96 sigma count uncertainty, all other matrices = Expanded Uncertainty (95% confidence interval). Gamma Spec = Expanded Uncertainty (95.4% Confidence Interval)

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-M	Pace Analytical Services - Minneapolis
PASI-PA	Pace Analytical Services - Greensburg

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92403741001	**MW-11**	EPA 3010A	437373	EPA 6010D	437415
92403741002	**MW-29S**	EPA 3010A	437373	EPA 6010D	437415
92403741003	**MW-29D**	EPA 3010A	437373	EPA 6010D	437415
92403741004	**MW-24**	EPA 3010A	437373	EPA 6010D	437415
92403741005	**MW-27D**	EPA 3010A	437373	EPA 6010D	437415
92403741006	**MW-33**	EPA 3010A	437373	EPA 6010D	437415
92403741007	**MW-34**	EPA 3010A	437373	EPA 6010D	437415
92403741008	**MW-35**	EPA 3010A	437373	EPA 6010D	437415
92403741009	**Field Blank**	EPA 3010A	437373	EPA 6010D	437415
92403741010	**Equipment Blank**	EPA 3010A	437373	EPA 6010D	437415
92403741011	**Duplicate**	EPA 3010A	437373	EPA 6010D	437415
92403741012	**MW-24 - Rerun**	EPA 3010A	443637	EPA 6010D	443657
92403741001	**MW-11**	EPA 3010A	437380	EPA 6020B	437426
92403741002	**MW-29S**	EPA 3010A	437380	EPA 6020B	437426
92403741003	**MW-29D**	EPA 3010A	437380	EPA 6020B	437426
92403741004	**MW-24**	EPA 3010A	437380	EPA 6020B	437426
92403741005	**MW-27D**	EPA 3010A	437380	EPA 6020B	437426
92403741006	**MW-33**	EPA 3010A	437380	EPA 6020B	437426
92403741007	**MW-34**	EPA 3010A	437380	EPA 6020B	437426
92403741008	**MW-35**	EPA 3010A	437380	EPA 6020B	437426
92403741009	**Field Blank**	EPA 3010A	437380	EPA 6020B	437426
92403741010	**Equipment Blank**	EPA 3010A	437380	EPA 6020B	437426
92403741011	**Duplicate**	EPA 3010A	437380	EPA 6020B	437426
92403741013	**MW-35 - Rerun**	EPA 3010A	443655	EPA 6020B	443663
92403741001	**MW-11**	EPA 3020	570608	EPA 6020A	571519
92403741002	**MW-29S**	EPA 3020	570608	EPA 6020A	571519
92403741003	**MW-29D**	EPA 3020	570608	EPA 6020A	571519
92403741004	**MW-24**	EPA 3020	570608	EPA 6020A	571519
92403741005	**MW-27D**	EPA 3020	570608	EPA 6020A	571519
92403741006	**MW-33**	EPA 3020	570608	EPA 6020A	571519
92403741007	**MW-34**	EPA 3020	570608	EPA 6020A	571519
92403741008	**MW-35**	EPA 3020	570608	EPA 6020A	571519
92403741009	**Field Blank**	EPA 3020	570608	EPA 6020A	571519
92403741010	**Equipment Blank**	EPA 3020	570608	EPA 6020A	571519
92403741011	**Duplicate**	EPA 3020	570608	EPA 6020A	571519
92403741001	**MW-11**	EPA 7470A	437340	EPA 7470A	437363
92403741002	**MW-29S**	EPA 7470A	437340	EPA 7470A	437363
92403741003	**MW-29D**	EPA 7470A	437340	EPA 7470A	437363
92403741004	**MW-24**	EPA 7470A	437340	EPA 7470A	437363
92403741005	**MW-27D**	EPA 7470A	437340	EPA 7470A	437363
92403741006	**MW-33**	EPA 7470A	437340	EPA 7470A	437363
92403741007	**MW-34**	EPA 7470A	437340	EPA 7470A	437363
92403741008	**MW-35**	EPA 7470A	437340	EPA 7470A	437363
92403741009	**Field Blank**	EPA 7470A	437340	EPA 7470A	437363
92403741010	**Equipment Blank**	EPA 7470A	437340	EPA 7470A	437363
92403741011	**Duplicate**	EPA 7470A	437340	EPA 7470A	437363

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92403741001	**MW-11**	EPA 903.1	317792		
92403741002	**MW-29S**	EPA 903.1	317792		
92403741003	**MW-29D**	EPA 903.1	317792		
92403741004	**MW-24**	EPA 903.1	317792		
92403741005	**MW-27D**	EPA 903.1	317792		
92403741006	**MW-33**	EPA 903.1	317792		
92403741007	**MW-34**	EPA 903.1	317792		
92403741008	**MW-35**	EPA 903.1	317792		
92403741009	**Field Blank**	EPA 903.1	317792		
92403741010	**Equipment Blank**	EPA 903.1	317792		
92403741011	**Duplicate**	EPA 903.1	317792		
92403741001	**MW-11**	EPA 904.0	317795		
92403741002	**MW-29S**	EPA 904.0	317795		
92403741003	**MW-29D**	EPA 904.0	317795		
92403741004	**MW-24**	EPA 904.0	317795		
92403741005	**MW-27D**	EPA 904.0	317795		
92403741006	**MW-33**	EPA 904.0	317795		
92403741007	**MW-34**	EPA 904.0	317795		
92403741008	**MW-35**	EPA 904.0	317795		
92403741009	**Field Blank**	EPA 904.0	317795		
92403741010	**Equipment Blank**	EPA 904.0	317795		
92403741011	**Duplicate**	EPA 904.0	317795		
92403741001	**MW-11**	Total Radium Calculation	319268		
92403741002	**MW-29S**	Total Radium Calculation	319268		
92403741003	**MW-29D**	Total Radium Calculation	319268		
92403741004	**MW-24**	Total Radium Calculation	319268		
92403741005	**MW-27D**	Total Radium Calculation	319268		
92403741006	**MW-33**	Total Radium Calculation	319268		
92403741007	**MW-34**	Total Radium Calculation	319268		
92403741008	**MW-35**	Total Radium Calculation	319268		
92403741009	**Field Blank**	Total Radium Calculation	319268		
92403741010	**Equipment Blank**	Total Radium Calculation	319268		
92403741011	**Duplicate**	Total Radium Calculation	319268		
92403741001	**MW-11**	SM 2540C-2011	437042		
92403741002	**MW-29S**	SM 2540C-2011	437042		
92403741003	**MW-29D**	SM 2540C-2011	437042		
92403741004	**MW-24**	SM 2540C-2011	437042		
92403741005	**MW-27D**	SM 2540C-2011	437298		
92403741006	**MW-33**	SM 2540C-2011	437113		
92403741007	**MW-34**	SM 2540C-2011	437113		
92403741008	**MW-35**	SM 2540C-2011	437113		
92403741009	**Field Blank**	SM 2540C-2011	437298		
92403741010	**Equipment Blank**	SM 2540C-2011	437113		
92403741011	**Duplicate**	SM 2540C-2011	437042		

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA18 North Pond CCR
Pace Project No.: 92403741

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92403741001	**MW-11**	EPA 300.0 Rev 2.1 1993	437285		
92403741002	**MW-29S**	EPA 300.0 Rev 2.1 1993	437285		
92403741003	**MW-29D**	EPA 300.0 Rev 2.1 1993	437285		
92403741004	**MW-24**	EPA 300.0 Rev 2.1 1993	437285		
92403741005	**MW-27D**	EPA 300.0 Rev 2.1 1993	437285		
92403741006	**MW-33**	EPA 300.0 Rev 2.1 1993	437285		
92403741007	**MW-34**	EPA 300.0 Rev 2.1 1993	437285		
92403741008	**MW-35**	EPA 300.0 Rev 2.1 1993	437285		
92403741009	**Field Blank**	EPA 300.0 Rev 2.1 1993	437285		
92403741010	**Equipment Blank**	EPA 300.0 Rev 2.1 1993	437285		
92403741011	**Duplicate**	EPA 300.0 Rev 2.1 1993	437285		

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☐ Mechanicsville ☒

Sample Condition Upon Receipt

Client Name: Golder

Project #: WO# : 92403741

92403741

Courier: ☐ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☑ Pace ☐ Other:____

Custody Seal Present? ☑ Yes ☐ No **Seals Intact?** ☑ Yes ☐ No

Date/Initials Person Examining Contents: 10-17-18

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A RSB

Thermometer: ☑ IR Gun ID: T-3 **Type of Ice:** ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 3.8 **Correction Factor: Add/Subtract (°C)** 0.1

Cooler Temp Corrected (°C): 3.7

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☐ N/A, water sample)
Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY **Field Data Required?** ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: ACP **Date:** 10/23/18

Project Manager SRF Review: ACP **Date:** 10/23/18

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project # WO#:92403741

PM: NMG Due Date: 10/26/18

CLIENT: 92-Golder

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)	BP1N	BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1	1			2 ✓																		2 ✓				
2		1	1			2 ✓																		2 ✓				
3		1	1			2 ✓																		2 ✓				
4		3	3			6 ✓																		2 ✓				
5		1	1			2 ✓																		2 ✓				
6		1	1			2 ✓																		2 ✓				
7		1	1			2 ✓																		2 ✓				
8		1	1			2 ✓																		2 ✓				
9		1	1			2 ✓																		2 ✓				
10		1	1			2 ✓																		2 ✓				
11		1	1			2 ✓																		2 ✓				
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

Pace Analytical®
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

2145060

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:
Company: Golder Associates	Report To: Mike Williams	Attention:
Address: 2108 W. Laburnum Ave Ste 200 Richmond, VA 23227	Copy To: A. Reynolds	Company Name:
Email To: Mike.Williams	Purchase Order No.:	Address:
Phone: 8043587900 Fax:	Project Name: Bremo PS 2S418 North Ash CCR	Pace Quote Reference:
Requested Due Date/TAT: Standard	Project Number: 18B7541B.1004	Pace Project Manager: N. Gasiorowski
		Pace Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER CCR

Site Location STATE: VA

Section D Required Client Information

Matrix Codes (MATRIX / CODE)

Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Tissue	TS
Other	OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: Boron, Calcium	Chloride, sulfate	TDS, Fluoride	As, Ba, Ca, Pb,	Li, Hg, Mo	Radium 226/228	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	MW-11	WT	G	—	—	10/15/18	1149		6	2		4						N	-	-	-	-	-	-		92403741
2	MW-29S	WT	G	—	—	10/15/18	1056		6	2		4						N	-	-	-	-	-	-		001
3	MW-29D	WT	G	—	—	10/15/18	1023		6	2		4						N	-	-	-	-	-	-		002
4	MW-24	WT	G	—	—	10/15/18	1400		6	2		4						N	-	-	-	-	-	-		003
5	MW-27D	WT	G	—	—	10/15/18	1308		6	2		4						N	-	-	-	-	-	-		004 *MS/MSD taken @ MW-24
6	MW-33	WT	G	—	—	10/16/18	1017		6	2		4						N	-	-	-	-	-	-		005
7	MW-34	WT	G	—	—	10/16/18	1144		6	2		4						N	-	-	-	-	-	-		006
8	MW-35	WT	G	—	—	10/16/18	1238		6	2		4						N	-	-	-	-	-	-		007
9	Field Blank	WT	G	—	—	10/16/18	1705		6	2		4						N	-	-	-	-	-	-		008
10	Equipment Blank	WT	G	—	—	10/16/18	1715		6	2		4						N	-	-	-	-	-	-		009
11	Duplicate	WT	G	—	—	10/15/18	1155		6	2		4						N	-	-	-	-	-	-		010
12																										011

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
Reporting Grp A	Golder	10/17/18	0955		10-17	9:55				
Level II Data Package		10-17	10:45	Rachel Burrum	10-17-18	1045	3.7	Y	Y	Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: B. Dieh / M Taylor

SIGNATURE of SAMPLER: Mary Taylor DATE Signed (MM/DD/YY): 10/15/18

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

December 12, 2018

Mike Williams
Golder Associates
2108 W Laburnum Ave
Suite 200
Richmond, VA 23227

RE: Project: Bremo North Pond Verification
Pace Project No.: 92409045

Dear Mike Williams:
Enclosed are the analytical results for sample(s) received by the laboratory on November 30, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
(704)875-9092
Project Manager

Enclosures

cc: Craig LaCosse, Golder Associates Inc.
Rachel Powell, Golder Associates
Amanda Reynolds, Golder Associates
Martha Smith, Golder Associates Inc.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92409045001	**MW-24**	Water	11/28/18 14:17	11/30/18 11:30
92409045002	**MW-35**	Water	11/28/18 12:55	11/30/18 11:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92409045001	**MW-24**	EPA 6010D	DS	1	PASI-A
92409045002	**MW-35**	EPA 6020B	KQ	1	PASI-A

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92409045001	**MW-24**					
EPA 6010D	Molybdenum	21.6	ug/L	5.0	12/04/18 20:25	
92409045002	**MW-35**					
EPA 6020B	Lithium	16.7	ug/L	2.5	12/06/18 17:49	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Sample: MW-24 **Lab ID: 92409045001** Collected: 11/28/18 14:17 Received: 11/30/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Molybdenum	**21.6**	ug/L	5.0	2.5	1	12/03/18 02:00	12/04/18 20:25	7439-98-7	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Sample: MW-35 **Lab ID: 92409045002** Collected: 11/28/18 12:55 Received: 11/30/18 11:30 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Lithium	**16.7**	ug/L	2.5	0.070	1	12/03/18 00:45	12/06/18 17:49	7439-93-2	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo North Pond Verification
Pace Project No.: 92409045

QC Batch: 445176 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92409045001

METHOD BLANK: 2440966 Matrix: Water
Associated Lab Samples: 92409045001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Molybdenum	ug/L	ND	5.0	2.5	12/04/18 20:19	

LABORATORY CONTROL SAMPLE: 2440967

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Molybdenum	ug/L	500	512	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2440968 2440969

Parameter	Units	92409045001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Molybdenum	ug/L	21.6	500	500	514	522	98	100	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo North Pond Verification
Pace Project No.: 92409045

QC Batch: 445169 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET
Associated Lab Samples: 92409045002

METHOD BLANK: 2440938 Matrix: Water
Associated Lab Samples: 92409045002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lithium	ug/L	ND	2.5	0.070	12/06/18 17:43	

LABORATORY CONTROL SAMPLE: 2440939

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lithium	ug/L	50	51.2	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2440940 2440941

Parameter	Units	92409045002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lithium	ug/L	16.7	50	50	62.6	62.5	92	92	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: Bremo North Pond Verification
Pace Project No.: 92409045

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A Pace Analytical Services - Asheville

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo North Pond Verification
Pace Project No.: 92409045

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92409045001	**MW-24**	EPA 3010A	445176	EPA 6010D	445192
92409045002	**MW-35**	EPA 3010A	445169	EPA 6020B	445185

WO# : 92409045

92409045

CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Lal
MTJL Log-in

ALL SHADED AREAS

Company: Golder Associates Inc

Billing Information: Accounts Payable

Address: 2108 W. Laburnum Ave Richmond VA 23227

Report To: M. Williams

Email To: areynolds@golder.com

Copy To: A. Reynolds

Site Collection Info/Address: North Pond

Customer Project Name/Number: Brenu Verification/17897541&100A

State: VA County/City: Fluvanna/Brenu Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Phone: Email: 804 358 7900

Site/Facility ID #: Brenu Pass Station

Compliance Monitoring? [X] Yes [ ] No

Collected By (print): A. Reynolds

Purchase Order #: Quote #:

DW PWS ID #: DW Location Code:

Collected By (signature):

Turnaround Date Required: Standard TAT

Immediately Packed on Ice: [X] Yes [ ] No

Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [ ] Hold: _____

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [ ] Yes [X] No

Analysis: _____

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **: 1 1

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other _____

Lab Project Manager:

Analyses: Lithium; Molybdenum

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Lithium	Molybdenum
MW-24	GW	Grab	~~11/8/18~~ AR		11/8/18	1417		1		X
MW-35	GW	Grab	~~11/8/18~~		11/28/18	1255		1	X	

Lab Profile/Line:

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	(Y)	N	NA
Custody Signatures Present	(Y)	N	NA
Collector Signature Present	(Y)	N	NA
Bottles Intact	(Y)	N	NA
Correct Bottles	(Y)	N	NA
Sufficient Volume	(Y)	N	NA
Samples Received on Ice	(Y)	N	NA
VOA - Headspace Acceptable	Y	N	(NA)
USDA Regulated Soils	Y	N	(NA)
Samples in Holding Time	(Y)	N	NA
Residual Chlorine Present	Y	N	(NA)
Sample pH Acceptable	(Y)	N	NA
Sulfide Present	Y	N	(NA)

Cl Strips: _____

pH Strips: _____

Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Level II Data Package

Type of Ice Used: Wet Blue Dry None

Packing Material Used:

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: 2326990

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: 1-3
Cooler 1 Temp Upon Receipt: 2.4 oC
Cooler 1 Therm Corr. Factor: 0.1 oC
Cooler 1 Corrected Temp: 2.3 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
	11/30/18 1035	Rachel Burress	11-30-18 1130
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:

MTJL LAB USE ONLY
Table #:
Acctnum:
Template:
Prelogin:
PM:
PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: _____ of: _____

Project Name: Bremo Power Station - North Ash Pond CCR

Project Reference Number: 178975418.100A

Sampling Event Date: October 15-16, 2018 and November 28, 2018

Review Date: 12/12/2018 *Initials:* ALR

Review Date: 12/28/2018 *Initials:* RIP

Person(s) performing the review are to initial each item on this form as acknowledgement of data acceptance, or as acknowledgement of a review issue. In the case of the latter, a brief explanation should follow the applicable item.

Golder Associates Inc. has reviewed the laboratory certificates of analysis, chain-of-custody form, and laboratory provided sample group quality assurance and quality control data for the above referenced sample group to identify potential bias or inaccuracy, in general accordance with the following United States Environmental Protection Agency (EPA) and Department of Energy (DOE) documents:

- National Functional Guidelines for Organic Superfund Methods Data Review, January 2017;
- National Functional Guidelines for Inorganic Superfund Methods Data Review, January 2017;
- US Department of Energy Evaluation of Radiochemical Data Usability, April 1997; and
- Sampling and Analysis Plan for US Department of Energy Office of Legacy Management Sites.

COMMON ACRONYMS:

- MS = matrix spike
- MSD = matrix spike duplicate
- LCS = laboratory control spike
- RPD = relative percent difference
- MB = method blank
- DUP = duplicate
- FB = field blank
- VSWMR = Virginia Solid Waste Management Regulations
- J = estimated
- ND and/or U= not detected
- COC = chain of custody
- QC = quality control
- µg/L = micrograms per liter
- mg/L = milligrams per liter
- EPA = United States Environmental Protection Agency
- pCi/L = picocuries per liter

COMPLIANCE ANALYTE LIST

☐ Historical VPDES Parameters

☒ CCR Appendix III to Part 257

☒ CCR Appendix IV to Part 257: Arsenic, Barium, Cobalt, Fluoride, Lead, Lithium, Mercury, Molybdenum, Radium 226 & 228

☐ VSWMR Phase II Parameters: _____

☐ Other: _____

Note: Pace Project Nos: 92403741 & 92409045

Golder
2108 West Laburnum Ave., Suite 200
Richmond, Virginia, USA 23227
T: +1 804 358-7900 | F: +1 804 358-2900

1.0 CHAIN OF CUSTODY (COC) REVIEW

Yes COC was properly signed by all parties.

Yes Correct project name and number are on the form.

Yes Sample receipt condition at laboratory was acceptable.

Yes Each sample and blank submitted for analysis appears in the data report.

Note: _____

2.0 SAMPLE HOLDING TIMES

Yes Holding times for extraction *and/or* analysis were met for each analytical method.

Review Criteria		
Method	**Analytes**	**Holding Time**
EPA 9056A	Chloride, fluoride, and sulfate	28 days
EPA 903.1 EPA 904.0	Radium 226 Radium 228	6 months
EPA 6000 series	Metals, except mercury	6 months
EPA 7470	Mercury	28 days
SM 2540C	TDS	7 days

Notes:_____

3.0 LABORATORY QUALITY CONTROL REVIEW

Yes Laboratory analyzed at least one internal blank for each method, where applicable.

Yes Laboratory blanks were interference free.

Notes: The following table presents method blank detections and their associated sample delivery groups (SDG; batch). In accordance with EPA guidance, associated samples within the same batch have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification is/is not recommended.

For radiochemistry data, if the reported absolute value of the method blank is above the minimum detectable concentration (MDC) and no other deficiencies are noted in the associated

dataset, detections above the MDC and less than 5 times the concentration reported in the method blank may be blank qualified "J" in accordance with qualification guidance. As presented below, data qualification is not recommended.

Parameter	Method Blank Detection (pCi/L)	Batch	Associated Qualified Sample(s)	Validator Qualifier
Lithium	0.072 J µg/L	443655	--	--
Radium-226	0.473	317792	--	--
Radium-228	0.687	317795	--	--

NA Surrogate recoveries are provided for each analytical method, where applicable.

NA Surrogate recoveries for each method are within the acceptable limits.

Notes: _____

Yes Tracer and carrier yields are provided for each analytical method, where applicable (Radiochemical Data Only).

Yes Tracer and carrier yields for each method are within the acceptable limits (Radiochemical Data Only).

Notes: _____

Yes MS/MSD/LCS/RPD data results are provided for each analytical method.

See Note MS/MSD/LCS/RPD recoveries for each method are within the acceptable limits.

Notes: The following table presents recoveries and relative percent differences (RPDs) that were outside of QC limits for the associated sample delivery group (analytical batch). In accordance with EPA guidance for evaluation of spike recoveries, the associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ), or unusable (R) using professional judgement to evaluate the spike recovery. Post-digestion spike recovery will be evaluated for MS/MSD qualification purposes where provided. As presented, no data qualification is recommended. No MS/MSD results were provided for radium-226 or radium-228.

In accordance with EPA guidance for evaluation of RPDs, the associated samples may be qualified estimated (J or UJ) using professional judgement to evaluate the RPD. As presented, no data qualification is recommended.

Parameter	Recovery Outside QC Limits	Batch	Associated Qualified Sample(s)	Validator Qualifier
Calcium	MS	437373	--	--

Yes Minimum Detectable Concentrations (MDCs) are provided for radiological samples.

Yes Radiological samples reported below their respective MDC have been qualified with a "U."

Notes: _____

Parameter	Associated Samples Below MDC
Radium-226	MW-11, MW-29S, MW-29D, MW-24, MW-27D, MW-33, MW-34, Field Blank, Equipment Blank, Duplicate
Radium-228	MW-29S, MW-29D, MW-34, MW-35, Field Blank, Equipment Blank, Duplicate
Total Radium	MW-11, MW-29S, MW-29D, MW-27D, MW-33, MW-34, MW-35, Field Blank, Equipment Blank, Duplicate

4.0 ANALYTE LISTS/METHODS

Yes The proper number of constituents are present for each analyte list as identified above (including detects where applicable).

Yes Proper EPA SW-846 analytical methods were used for analysis.

Notes: _____

5.0 OUTLIER EVALUATION

Yes Analytical results have been evaluated for variances +/- 25% compared to the average of the most recent 8 data points.

Yes Analytical results with variances >25% have been evaluated for trends.

Yes If no trends were identified for analytical results with variances >25%, a data quality review (DQR) was conducted for suspect analytical results identified as possible outliers. DQR results summarized below.

Analyte	Location	DQR identified issues?	Re-analysis requested?	Outlier Identification
Lithium	MW-35	High concentration reported. No issues noted with MS/MSD or associated method blank. Lithium was detected at a low concentration in the Field Blank	Yes	Reanalysis confirmed results. Verification sampling refuted original results and are reported in data tabulation
Molybdenum	MW-24	High concentration reported. No issues noted with MS/MSD or associated QC samples.	Yes	Reanalysis confirmed results. Verification sampling refuted original results and are reported in data tabulation

6.0 DATA REPORTING

See Note Trip; field and/or equipment; and laboratory blank results have all been reported and the detected constituents in these blanks, if any, have been qualified using professional judgement where detected in other samples.

Notes: The following table presents field blank detections and associated samples that have been qualified. In accordance with EPA guidance, associated samples have been evaluated using professional judgement. Inorganic data less than 10X the blank concentration may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data (i.e. the highest concentration reported over the last 8 sampling events). Organic data corresponding to blank contamination may be qualified if the detection is not considered part of a visual data trend and is not consistent with recent historical data. Additionally, associated samples for organic common lab contaminants (acetone, MC, and MEK) may be qualified if the results are 2X greater than the detected blank concentration. Associated samples may be qualified estimated high (J+), estimated low (J-), non-detect estimated (UJ) or unusable (R). As presented below, data qualification is not recommended.

Sample ID	Parameter	Blank Detection (µg/L)	Associated Qualified Sample(s)	Validator Qualifier
Equipment Blank	Barium	5.0	--	--
Field Blank	Lithium	0.096 J	--	--

Yes It is clear from the laboratory report that samples have or have not been diluted during analysis, and if the samples have been diluted, the result is reported as a multiple of the dilution (*e.g.*, a sample diluted 10x resulting in an analytical detection of 1.0 should be reported as 10).

Yes The report provides the reporting limit for each constituent.

Yes The proper reporting limits have been used (*e.g.* NC Solid Waste Section approved PQLs, or VA DEQ Permit approved detection limits, as appropriate).

Notes: _____

7.0 FIELD DUPLICATE PRECISION

Yes Field duplicate sample results were within control limits of 20% relative percent difference for sample results greater than 5 times the quantitation limit. When one or both results were less than 5 times the quantitation limit, the difference between the two results was less than twice the

reporting limit.

Notes: The following table presents field duplicates and their associaed parent samples that were not within control limits. In accordance with EPA guidance, sample results with field duplicate imprecison may be qualified estimated (J) or non-detect estimated (UJ). As presented below, data qualification is not recommended.

Parameter	Associated Samples	Parent Sample Result (µg/L)	Duplicate Sample Result (µg/L)	Re-analysis Requested?	Outlier Indentification
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