Revised Nature and Extent Study Addendum
North Pond

Bremo Power Station
Solid Waste Permit No. 618

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EXECUTIVE SUMMARY

On behalf of Dominion Energy Virginia (Dominion Energy), Golder Associates Inc. (Golder) has prepared this updated Nature and Extent Study (NES) to support the Assessment of Corrective Measures (ACM) Addendum for the North Pond at the Bremo Power Station (Station) in Bremo Bluff, Virginia. The purpose of the NES is to delineate the vertical and horizontal extent of constituent of concern (COC) concentrations in groundwater that exceed the Federal Groundwater Protection Standards (GWPS) and Virginia Solid Waste Permit No. 618 State Groundwater Protection Standards (GPS) in the vicinity of the North Pond.

On April 30, 2020, a new federal CCR GWPS exceedance was documented at the North Pond in the sample collected from monitoring well MW-24 (cobalt). This new GWPS exceedance triggered the need for an Assessment of Corrective Measures (ACM) for cobalt under the CCR Rule. GWPS exceedances for lithium were previously addressed in an ACM Report placed in the North Pond's CCR operating record on May 4, 2019. Subsequently, on May 14, 2020, solid waste permit GPS exceedances were documented in the North Pond samples collected from monitoring wells MW-24 (cobalt), MW-27D (boron, lithium, molybdenum, silver), MW-33, (nickel), MW-34 (boron), and MW-35 (boron). In accordance with Virginia Solid Waste Management Regulations (VSWMR) 9 VAC 20-81-260 *et seq*., these exceedances triggered the need for an ACM for boron, cobalt, lithium, molybdenum, nickel, and silver.

To fulfill the requirements of the ACM and to delineate the vertical and horizontal extent of the GPS and GWPS exceedances in the vicinity of the North Pond, the following field program was completed:

- Sampling and evaluation of five additional groundwater observation wells in the vicinity of the North Pond, including two boundary wells downgradient of MW-27D and three wells between the point of compliance and the downgradient property line;
- Sampling of four hyporheic zone sampling ports to assess groundwater quality in shallow mixing zones adjacent to downgradient drainage features;
- Sampling of two downgradient surface monitoring points;
- Evaluation of data collected during the 2019 ACM field investigation from three dewatering wells installed in the ash material in the North Pond;
- Evaluation of routine groundwater monitoring data collected during the August 2020 Modified Assessment Monitoring Program event; and
- Evaluation of routine surface water monitoring data provided by Dominion Energy from 10 surface water monitoring points along the James River, including four monitoring points immediately downgradient of the North Pond.

Geological and hydrogeological information collected during the investigation was generally consistent with previous site investigations and confirmed the existing Site Conceptual Model. Using the information evaluated during this investigation, the NES delineates the inferred vertical and horizontal extents of:

EXECUTIVE SUMMARY

- Boron concentrations in groundwater which exceed the solid waste permit background-based GPS (250 micrograms per liter [µg/L]);
- Cobalt concentrations in groundwater which exceed the background-based solid waste permit GPS and background-based federal CCR GWPS (7.83 µg/L);
- Lithium concentrations in groundwater which exceed the background-based solid waste permit GPS (25 µg/L) and federal CCR GWPS (40 µg/L);
- Molybdenum concentrations in groundwater which exceed the solid waste permit background-based GPS (16.4 µg/L);
- Nickel concentrations which exceed the solid waste permit background-based GPS (7.9 µg/L); and
- Silver concentrations which exceed the solid waste permit background-based GPS (5.0 µg/L).

Analytical data generated as part of the study support a limited extent scenario for boron, cobalt, lithium, and molybdenum impacts (GPS exceedances) in groundwater.

The boron impacts are generally localized around southwestern berm of the North Pond. Boron results at surface water monitoring points along the James River were not reported above a method detection limit of 63.0 µg/L. Based on modeling results and confirmation surface water sampling results, the boron impacted groundwater is not adversely impacting surface water.

The cobalt impacts are generally localized around compliance monitoring well MW-24, which was the only compliance monitoring location with an exceedance of the cobalt GPS. Similarly, the lithium and molybdenum impacts are generally localized around compliance monitoring well MW-27D, which was the only compliance monitoring location with exceedance of the lithium GWPS/GPS and molybdenum GPS.

The nickel and silver impacts observed at compliance monitoring wells MW-33 and MW-27D, respectively, were not observed during the August 2020 compliance and NES sampling events and are believed to have been false-positive laboratory results.

Based on the results of this NES, and in consideration of the continued Station activities at the North Pond, including ongoing dewatering activities, Golder has prepared an ACM Addendum Report under separate cover in which potential corrective actions are evaluated for the remediation of the observed impacts to groundwater as described herein.

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1.0 INTRODUCTION AND BACKGROUND

Golder Associates Inc. (Golder) prepared this *Nature and Extent Study Addendum Report* (Report) on behalf of Virginia Electric and Power Company d/b/a Dominion Energy Virginia (Dominion Energy) for the North Pond at the Bremo Power Station (Station) in Bremo Bluff, Virginia. The North Pond is considered an active CCR surface impoundment under 40 Code of Federal Regulations (CFR) Part 257.50 *et seq*. (Disposal of Coal Combustion Residuals [CCR] from Electric Utilities) as well as under 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]). As an active CCR surface impoundment in the Commonwealth of Virginia, the North Pond is also subject to regulation under the Virginia Solid Waste Management Regulations (VSWMR). Consistent with these regulations, the Unit is operated by Dominion Energy under Solid Waste Permit (SWP) No. 618 issued by the Virginia Department of Environment Quality (DEQ) on June 5, 2019.

This Report was prepared in response to federal and state Groundwater Protection Standard exceedances (federal CCR GWPS and Virginia Solid Waste Permit GPS, respectively). Specifically, on April 30, 2020, a new federal CCR GWPS exceedance was documented at the North Pond in monitoring well MW-24 (cobalt). This exceedance triggered the need for an Assessment of Corrective Measures (ACM) for cobalt under the CCR Rule. The GWPS exceedance of lithium in MW-27D was previously addressed in an ACM Report placed in the North Pond's CCR operating record on May 4, 2019. Subsequently, on May 14, 2020, solid waste permit GPS exceedances were documented in the North Pond samples collected from monitoring wells MW-24 (cobalt), MW-27D (boron, lithium, molybdenum, silver), MW-33, (nickel), MW-34 (boron), and MW-35 (boron).

The updated Nature and Extent Study (NES) was completed to support the Assessment of Corrective Measures (ACM) Addendum Report required under 40 CFR Section 257.96 (40 CFR Part 257.96) of the Federal CCR Rule following the documentation of federal GWPS exceedances. Specifically, once a federal CCR GWPS exceedance has been documented for an Appendix IV constituent, the CCR Rule requires the initiation of an ACM within 90 days of documenting the federal CCR GWPS exceedance unless a successful Alternative Source Demonstration (ASD) is completed. Consistent with the CCR Rule, the ACM must be completed within an additional 90 days unless a demonstration for additional time based on a site-specific condition or circumstances is completed. Pursuant to section 257.96(a) of the CCR Rule, a demonstration of need for a 60-day extension was certified by a professional engineer and placed in the Station's operating record on October 15, 2020. A copy of the extension request will be included in the North Pond's annual groundwater monitoring and corrective action report consistent with the provisions of the CCR Rule.

Similarly, when a solid waste permit GPS is exceeded, 9 VAC 20-81-260 *et seq*. of the VSWMR require initiation of the ACM, to include a NES, within 90 days of documenting the solid waste permit GPS exceedance unless a successful ASD is completed. Similar to the CCR Rule, the Station has an additional 90 days to complete the ACM

under the VSWMR unless a demonstration for additional time based on a site-specific condition or circumstance is approved by the DEQ.

Site assessment activities were completed between March and August 2020 pursuant to the requirements in the CCR Rule, the VSWMR, and the requirements of SWP No. 618. The investigation evaluated the following GPS/GWPS exceedances at the North Pond.

- Exceedances of solid waste permit GPS for boron (MW-27D, MW-34, MW-35);
- Exceedances of solid waste permit GPS and federal GWPS for cobalt (MW-24);
- Exceedances of solid waste permit GPS and federal GWPS for lithium (MW-27D);
- Exceedance of solid waste permit GPS for molybdenum (MW-27D);
- Exceedance of solid waste permit GPS for nickel (MW-33); and
- Exceedance of solid waste permit GPS for silver (MW-27D).

This Report summarizes the investigation activities and findings.

1.1 Site Setting and Background

As shown on Figure 1, a portion of the United States Geological Survey (USGS) 7½ minute topographic map of Arvonia, Virginia, the site vicinity has moderately steep topography in the upland areas bordering the Station. The local topography is dissected by drainage swales that have developed a mix of dendritic and trellis drainage patterns reflecting an underlying structure control. Both intermittent and perennial streams characterize surface flow in the vicinity of the Station, with broad ridges and hilltops serving as topographical highs (maximum elevations of roughly 450 feet above mean sea level [AMSL] to the north of the Station). A portion of the Station, including the former generation station and the East and West Ponds, is located within the James River floodplain where topographic elevations range from 230 to 200 feet AMSL. The North Pond is located in the northern portion of the Station in an upland area outside of the floodplain.

As presented on the aerial photograph inlay on Figure 2, 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 primarily by undeveloped parcels. The Station property 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. Other than a process water supply well that is located on the Station, there are no known water supply wells on the Station or within the immediate vicinity of the Station boundary.

Power generation activities at the Station were initiated in the late 1930's. Ash from the power generation activities has historically been stored in the three on-site coal combustion residual (CCR) surface impoundments (North Pond, West Pond, and East Pond). In 2014, the Station converted from a coal-fired power plant to a natural

gas-fired power plant. No newly generated CCR has been placed in these impoundments since the conversion to a gas-fired plant. The Station ceased power generation activities in 2018. Storage of existing CCR materials at the Station has been consolidated to the North Pond, with removal of CCR materials formerly stored in the West Pond to the North Pond having been completed in 2020, and removal of CCR material from the East Pond to the North Pond completed in early 2019.

Historically, groundwater at the Station was monitored under Virginia Pollutant Discharge Elimination System (VPDES) Permit (Permit No. VA0004138). Background sampling activities for the CCR Rule for the North Pond were initiated in October 2016 following installation of additional monitoring wells for these units. The background sampling activities for the North Pond under the CCR Rule were completed in July 2017. The initial CCR Rule Detection Monitoring Program event for the North Pond was completed on September 6, 2017. Based on the results from the initial CCR Rule Detection Monitoring Program sampling event, a CCR Rule Assessment Monitoring Program was initiated (initial CCR Rule Appendix III and IV sampling event) for the North Pond on January 29, 2018, following placement of the statistically significant increase notification in the operating record on December 13, 2017, consistent with the CCR Rule. The initial semi-annual assessment monitoring program sampling event for the North Pond was completed on April 30, 2018. On September 6, 2018, federal GWPS exceedances for lithium were documented at the North Pond in samples collected from monitoring wells MW-27D and MW-35. These exceedances triggered the need for an ACM for lithium. Dominion Energy completed the required investigation and presented the results in an ACM Field Investigation Report dated May 3, 2019 (Golder 2019a). A supporting ACM was also completed on May 3, 2019 (Golder, 2019b).

On June 5, 2019, SWP No. 618 was issued by DEQ with groundwater monitoring provisions for all three of the Ponds at the Station. The Station currently monitors groundwater in accordance with the Modified Assessment Monitoring Program (AMP) as established in the SWP.

The footprint of the CCR materials stored in the North Pond is currently covered by a Wind Defender® rain cover. This rain cover significantly reduces precipitation from infiltrating through the unit.

This Report is an Addendum to the May 3, 2019, ACM Field Investigation Report (Golder, 2019a) and incorporates relevant information from that report in support of the horizontal and vertical extent delineation of groundwater impacts as presented herein, as well as relevant information pertaining to the likely source(s) of the constituents of interest.

1.2 Project Objectives and Report Structure

The purpose of the investigation is to delineate the nature and extent of boron, cobalt, lithium, molybdenum, nickel, and silver concentrations that exceed the GPS and/or GWPS in groundwater. Based on the extent of the investigation, the ACM Addendum report, being prepared under separate cover, presents an evaluation of potential remedial options for the documented groundwater impacts.

2.0 FIELD INVESTIGATION SUMMARY

Field investigations were completed in August 2020. Details for the completed activities are presented in the following sections.

2.1 Compliance Groundwater Sampling

Under Permit Module XI, Dominion Energy is required to monitor groundwater in the uppermost aquifer beneath the North Pond under a Modified Assessment Monitoring Program (AMP). The provisions of the Modified AMP are consistent with the groundwater monitoring requirements of the VSWMR and the CCR Rule. The groundwater monitoring activities are conducted pursuant to the provisions outlined in the *Groundwater Monitoring Plan* prepared for the Bremo Power Station. The approximate locations of the compliance monitoring wells in the compliance network for the North Pond are shown on Figure 3. The North Pond monitoring network is presented in Table 1, following.

Table 1: North Pond Monitoring Network

Upgradient Compliance Monitoring Wells		
MW-11	MW-29S	MW-29D
Downgradient Compliance Monitoring Wells		
MW-24	MW-27D	MW-33
MW-34	MW-35	--
Sentinel Monitoring Wells		
MW-25S	MW-25D	MW-26S
MW-26D	MW-27S	MW-28

To supplement the NES investigation delineation activities, the analytical results from the routine second semi-annual 2020 compliance event completed on August 24 through 26, 2020, were used in this evaluation. The analytical results for the second semi-annual compliance event are summarized in Tables 2 and 3, the laboratory certificates of analysis and chain-of-custody forms are presented in Appendix A, and the field logs for the compliance event are presented in Appendix B.

2.2 Comprehensive Groundwater Elevation Assessment

A comprehensive round of groundwater elevation measurements was collected on August 24, 2020, from monitoring and observation wells in the vicinity of the North Pond to support the evaluation of groundwater flow

direction and horizontal and vertical groundwater gradients in the vicinity of monitoring wells with GWPS or GPS exceedances. A summary of groundwater elevations with available historical data is presented in Table 4. Discussion of groundwater flow and gradients is presented in Section 3.1.

2.3 NES Sample Collection

2.3.1 Groundwater Sample Collection

To supplement the data from the routine semi-annual groundwater monitoring event conducted at the Station in August 2020, five additional groundwater samples were collected as part of the NES field program on August 27-28, 2020. The samples were collected from the following location: observation wells MW-22S, MW-22D, MW-36S, MW-36D, and MW-VPDES. The locations of these supplementary groundwater observation locations are depicted in Figure 3.

The groundwater samples were collected in accordance with the procedures in the Station's *Groundwater Monitoring Plan* using low-flow micropurge sampling techniques. Wells were sampled using a decontaminated non-dedicated bladder pump with disposable bladders. During the purge at each well location, periodic samples were collected for field analysis of dissolved oxygen (DO), oxidation-reduction potential (ORP), pH, specific conductance, turbidity, and temperature. Water quality parameters were collected using a field-calibrated water quality meter equipped with a flow-through cell during well purge, and after sample collection. Groundwater field measurements are summarized on Field Data Sheets provided in Appendix C.

Groundwater samples were collected directly from the discharge tube on the pump into pre-labeled, laboratory supplied, pre-preserved sample containers. Following collection, the samples were placed in a cooler on ice under chain-of-custody control and couriered to Pace Analytical Services, Inc. (Pace) of Huntersville, North Carolina. Pace is a Virginia Environmental Laboratory Accreditation Program (VELAP)-certified laboratory for the require analyses. The groundwater samples were submitted for analysis of the following constituents:

- CCR Rule Appendix III Metals (boron and calcium) by SW-846 6010D;
- CCR Rule Appendix III Anions (chloride and sulfate) by SW-846 9056A
- CCR Rule Appendix IV Metals (cobalt, lithium, and molybdenum) by SW-846 Methods 6010D and 6020B;
- VSWMR Table 3.1 Metals (nickel and silver) by SW-846 Methods 6010D and 6020B;
- Metals (magnesium, potassium, sodium) by SW-846 Methods 6010D and 6020B; and
- Alkalinity by Standard Method 2320B.

Groundwater sampling locations, dates, and analyses performed are summarized in Table 5. Laboratory analytical reports are provided in Appendix D.

2.3.2 NES Surface Water/Hyporheic Zone Sample Ports

The ACM investigation surface water sampling activities were conducted on August 28, 2020, and included the collection of two surface water and four hyporheic zone (HZ) samples (see Figure 3). Surface water samples were collected in general accordance with United States Environmental Protection Agency (USEPA) surface water sampling procedures in pre-labeled, laboratory supplied, pre-preserved sample containers. The HZ samples were collected using disposable bailer into pre-labeled, laboratory supplied, pre-preserved sample containers. After sample collection, water quality parameters were collected and analyzed in the field for DO, ORP, specific conductance, pH, and temperature for the surface water and HZ samples. Field water quality measurements are summarized on Field Data Sheets provided in Appendix E.

The samples were placed in a cooler on ice under chain-of-custody control and shipped to Pace for analysis of the following constituents:

- CCR Rule Appendix III Metals (boron and calcium) by SW-846 6010D;
- CCR Rule Appendix III Anions (chloride and sulfate) by SW-846 9056A
- CCR Rule Appendix IV Metals (cobalt, lithium, and molybdenum) by SW-846 Methods 6010D and 6020B;
- VSWMR Table 3.1 Metals (nickel and silver) by SW-846 Methods 6010D and 6020B;
- Metals (magnesium, potassium, sodium) by SW-846 Methods 6010D and 6020B; and
- Alkalinity by Standard Method 2320B.

The results from the surface water and HZ sample analyses are summarized in Table 6. Laboratory analytical reports are provided in Appendix F.

2.3.3 2019 North Pond Interstitial Water

Consistent with the CCR Rule requirements to characterize the nature and quantity of material released (257.95(g)(1)(ii), samples of interstitial water from within the North Pond were collected from three de-watering wells installed through the CCR material in the pond. The interstitial water sampling and analysis program was conducted on January 16, 2019, and consisted of the collection of three pore water samples from deep dewatering wells SDW-4, SDW-7, and SDW-10 in the North Pond. The approximate locations of these wells are shown on Figure 3. These samples are being reevaluated as part of this Report.

Based on well reports provided by Moretrench, these wells are constructed with 40 to 60 feet of screen and are screened to maximum depths of between 56 and 83 feet bgs in ash. Samples were collected from a dedicated pump hose installed at each well head using the existing well pumps. Prior to sampling, wells were purged until water was visibly clear of sediment or fouling. Samples were collected into pre-labeled, laboratory supplied, pre-preserved sample containers. After sample collection, water quality parameters were collected and analyzed in the field for DO, ORP, specific conductance, pH, and temperature. The samples were placed in a cooler on ice

under chain-of-custody control and shipped to ALS Environmental Laboratories, Inc. (ALS) of Houston, Texas (selected samples - isotopes only) and Pace for analysis of the following constituents, which includes the full CCR Rule Appendix III and IV suite, VSWMR metals nickel and silver, plus additional voluntary parameters and isotopes.

Interstitial water sampling locations and analyses performed in 2019 are summarized in Table 7. The field logs and laboratory analytical results were previously presented in the *ACM Field Investigation Report* (Golder 2019a) and are not re-presented herein.

2.4 Data Validation

Laboratory analytical data associated with the supplemental NES sampling events conducted in August 2020 were validated in accordance with the following USEPA documents:

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

The quality assurance and quality control (QA/QC) laboratory data review documents are included in Appendix G. Based on the data validation process, the supplemental groundwater, surface water, and HZ sample data associated with the NES investigation was accepted for use. It is noted that the matrix spike/matrix spike duplicates for alkalinity, calcium, chloride, fluoride, magnesium, sodium, and sulfate were outside acceptable recovery limits for one or more sample groups. Data are accepted based on acceptable laboratory control samples. Additionally, the boron results for SW-1, HZ-2, HZ-3, MW-22D, MW-23D, and MW-36D were qualified as estimated per EPA protocol due to detections of boron in the associated sample group QC samples (method blank).

3.0 INVESTIGATION RESULTS

The following sections present an evaluation of hydrogeology in the vicinity of the North Pond and present the analytical results for the surface water and groundwater samples collected in August 2020.

3.1 Hydrogeology

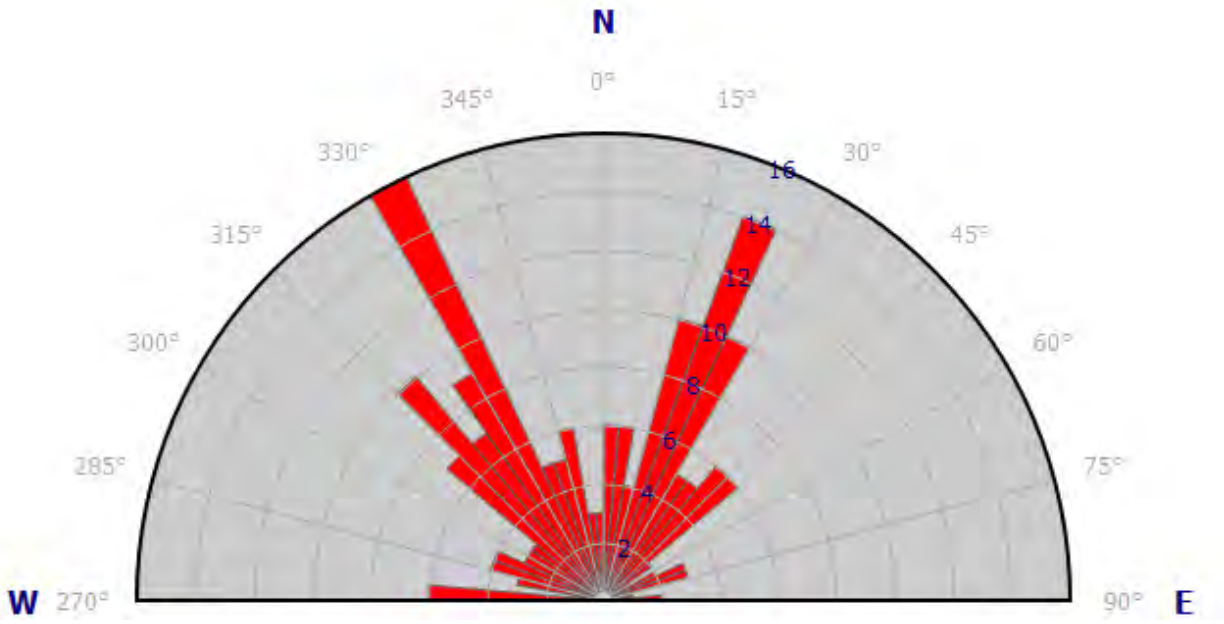
The geology underlying the site in the vicinity of the North Pond has been widely characterized during previous investigations conducted at the Station, and the geological observations made during the 2019 and 2020 ACM field investigations were consistent with the results of these previous investigations. In general, the Site Conceptual Model developed for the North Pond area is comprised of an upland recharge area and a hydrogeologic boundary associated with the James River to the southwest. The uppermost aquifer potentiometric surface transcends geologic boundaries, with the aquifer matrix ranging from saprolite, fractured or weathered bedrock (various), to alluvium associated with the James River downgradient of the North Pond. These different geological units are expected to impart variability to the uppermost aquifer hydraulic properties as well as geochemical conditions. Table 8 provides a brief overview of the lithology in which various wells in the vicinity of the North Pond are screened. The Site Conceptual Model and the *Groundwater Monitoring Plan* also provide an overview of the site geology.

The water table surface in the vicinity of the North Pond generally mimics the topography with groundwater elevations ranging approximately from 350 ft AMSL in the upland recharge area north of the North Pond to 200 ft AMSL along the boundary with the James River. Historical static water level data for the site is summarized in Table 4. The depth-to-water measurements collected on August 24, 2020, were used to prepare groundwater elevation contours which are depicted in Figure 4. As presented, the morphology of the water table surface and the apparent groundwater flow direction are consistent with previous monitoring events, with groundwater flow primarily toward the James River to the southwest and localized components of flow toward drainage features immediately west and south of the North Pond.

The North Pond is located within the James River floodplain and near-surface geology is primarily mapped as alluvium materials. Previous investigations in the North Pond area have identified gneiss or biotite schist bedrock underlying the alluvium materials, consistent with bedrock mapped in upland areas in the site vicinity. Geophysical analysis of deep bedrock boreholes in the vicinity of the North Pond conducted in 2018 (Golder, 2019) found that fractures are predominantly oriented to the northeast, parallel to geological strike. Another set of fractures was identified oriented to the west-northwest (approximately perpendicular to geological strike). Fractures identified during geophysical analysis were typically moderately to steeply dipping, with a few horizontal or near-horizontal fractures. The steeply dipping fractures create some preferential flow parallel and perpendicular to geologic strike (*i.e.,* northeast-southwest and approximately east-west). The results of the lineament analysis performed as part of this NES are generally consistent with the previous geophysical analysis. As summarized in Exhibit 1 below, two

sets of lineament orientations were identified: one predominantly to the north-northeast, and one to the north-northwest.

Exhibit 1: Lineament Analysis Rose Diagram



Using the conceptual groundwater flow lines shown in Figure 4, which run northeast-southwest and approximately east-west, average groundwater flow rates for the uppermost aquifer near the North Pond were calculated. The rate of transport for the constituents of concern is conservatively estimated to be the velocity of groundwater for the purposes of the conceptual site model. Groundwater flow velocities were calculated as illustrated in the following sections.

3.1.1 Hydraulic Conductivity

Analysis of slug testing data obtained from the observation and monitoring wells evaluated in 2012, 2016, 2017, 2019, and 2020 indicates that the average hydraulic conductivity of the uppermost unconfined aquifer is variable depending on the aquifer matrix. The following table summarizes the estimated hydraulic conductivities for the various aquifer matrices present at the Station based on analysis of the slug testing data using the Aqtesolv™ software and appropriate data evaluation procedures.

Aquifer Matrix	Maximum Hydraulic Conductivity (ft/s)	Minimum Hydraulic Conductivity (ft/s)	Estimated Average Hydraulic Conductivity(ft/s)
Saprolite	5.98E-06	1.76E-06	3.24E-06
Slate/Phyllite Bedrock	2.66E-05	1.46E-06	6.35E-06

Aquifer Matrix	Maximum Hydraulic Conductivity (ft/s)	Minimum Hydraulic Conductivity (ft/s)	Estimated Average Hydraulic Conductivity(ft/s)
Gneiss Bedrock	5.09E-04	1.56E-08	1.53E-05

Note: ft/s = feet per second

Using these updated hydraulic conductivity values, as presented in the March 2020 GMP (Golder 2020), the geometric average hydraulic conductivity value for the slate/phyllite bedrock matrix in the vicinity of the North Pond is calculated to be approximately 6.35E-06 ft/s or 0.54 feet per day and the geometric average hydraulic conductivity value for the gneiss bedrock matrix in the vicinity of the North Pond is calculated to be approximately 1.53E-05 ft/s or 1.32 feet per day. These results are consistent with previous results developed based on the current Site Conceptual Model.

3.1.2 Horizontal Component of Flow

In the vicinity of the North Pond, the uppermost aquifer occurs within a matrix comprised of partially weathered rock (saprolite) and competent fractured bedrock. The effective porosity of the saprolite is estimated at approximately 20% based on expected primary and secondary porosity (chemical and physical weathering). The porosity of the bedrock is expected to range from a whole-rock porosity based primarily on secondary porosity (discontinuities) of approximately 1% to 5% or less on a megascopic to macroscopic scale to greater than 50% on a microscopic scale along discrete preferential flow pathways within the fractioned rock (*i.e.*, open fractures). On average the effective porosity of the saprolite and bedrock is estimated at 2.5% (Fetter, 1988). The horizontal component of flow was evaluated for flow paths in the vicinity of MW-27D, MW-33 and MW-34, and MW-35 and MW-24, as described below.

Using the water levels obtained on August 24, 2020, a potentiometric surface was prepared for the study area and is presented as an overlay on Figure 9. As presented, the average hydraulic gradient for the uppermost aquifer spanning from the upland area north of the North Pond to bedrock Outcrop 1 (i_{gw1}) was calculated as follows:

$$i_{gw} = \left({}^{h_L}/_{L}\right)$$

$$i_{gw} = \left({}^{350\ ft\ amsl - 225\ ft\ amsl}/_{3{,}214\ ft}\right)$$

$$i_{gw} = 0.0389$$

Where:

$i_{gw} = gradient$
$h_L = head\ loss\ (elevation\ difference)$
$L = length\ (horizontal\ difference)$

Using the average hydraulic conductivity and horizontal hydraulic gradient calculated above, the average rates of groundwater flow (V_{gw1}) in the uppermost aquifer beneath the unit were calculated using the following equation and are presented below:

$$V_{gw} = K\, i_{gw}(1/n_e)$$

Where:

$V_{gw} = groundwater\ velocity$
$K = hydraulic\ conductivity$
$i_{gw} = gradient$
$n_e = effective\ porosity$

Area	Geologic Matrix	Gradient (unitless)	Effective Porosity (%)	Hydraulic Conductivity (ft/s)	Flow Rate (ft/day)
Outcrop 1 (V_{gw1})	Saprolite	3.89E-02	0.20	3.24E-06	19.9
	Slate/Phyllite Bedrock	3.89E-02	0.025	6.35E-06	312
	Gneiss Bedrock	3.89E-02	0.025	1.53E-05	750

Notes: ft/s = feet per second ft/day = ft per day

Using similar evaluations, the other areas of the site were evaluated as follows:

Area	Geologic Matrix	Gradient (unitless)	Effective Porosity (%)	Hydraulic Conductivity (ft/s)	Flow Rate (ft/day)
MW-33 & MW-34 (V_{gw2})	Saprolite	4.46E-02	0.20	3.24E-06	22.8
	Slate/Phyllite Bedrock	4.46E-02	0.025	6.35E-06	357
	Gneiss Bedrock	4.46E-02	0.025	1.53E-05	861
MW-36S & MW-36D (V_{gw3})	Saprolite	4.38E-02	0.20	3.24E-06	22.4
	Slate/Phyllite Bedrock	4.38E-02	0.025	6.35E-06	351
	Gneiss Bedrock	4.38E-02	0.025	1.53E-05	845

Notes: ft/s = feet per second ft/day = ft per day

3.1.3 Vertical Gradient Evaluation

Using groundwater elevation data from August 2020, the vertical gradients within the aquifer were evaluated using various well pairs as presented below. The vertical gradients for these well pairs were calculated as shown below.

$$i_{gw} = \left(h_L/L\right)$$

Where:

$$i_{gw} = gradient$$
$$h_L = head\ loss\ (elevation\ difference)$$
$$L = length\ (vertical\ difference - midpoint\ of\ well\ screens)$$

Table 9: Vertical Gradient Summary

Well Pair	Shallow Groundwater Elevation (ft AMSL)	Deep Groundwater Elevation (ft AMSL)	Distance (ft)	Gradient (unitless)
MW-25S / MW-25D	316.54	316.51	60	0.0005
MW-26S / MW-26D	341.02	340.87	30	0.005
MW-27S / MW-27D	289.65	289.36	110.5	0.0026
MW-29S / MW-29D	346.50	347.43	84.5	-0.011
MW-36S / MW-36D	232.51	238.18	39	-0.145

Notes: ft = feet AMSL = above mean sea level

Negative gradients indicate an upward gradient. As summarized in Table 9, gradients calculated for well pairs in the vicinity of the North Pond are primarily downward, consistent with the Site Conceptual Model as the three well pairs are located in upland recharge areas. A slight upward gradient was calculated at well pair MW-29S/MW-29, though downward gradients have been calculated at this well pair in the past as this well pair is located near an upland recharge area. The upward gradient calculated from the August 2020 groundwater elevation data is likely related to seasonal fluctuations in groundwater elevation. An upward gradient was calculated at well pair MW-36S/MW-36D, which may reflect groundwater infiltration in the surface water drainage feature immediately to the east consistent with the Site Conceptual Model.

3.2 Groundwater Analytical Results

Groundwater analytical results for samples collected during the NES investigation are presented in Table 5. Historical monitoring data for boron, cobalt, lithium, molybdenum, nickel, and silver at North Pond area wells are presented in Table 10. Key observations include:

- Boron was detected at concentrations exceeding the solid waste permit GPS of 250 µg/L at North Pond CCR compliance wells MW-27D, MW-34, and MW-35 during the first semi-annual monitoring event conducted in March 2020 and the second semi-annual monitoring event conducted in August 2020. Additionally, boron was detected at a concentration exceeding the solid waste permit GPS at MW-22D, MW-36D, and MW-VPDES during the supplementary groundwater sampling event in August 2020. Concentrations of boron detected in groundwater in the vicinity of the North Pond during these events ranged from an estimated concentration of

44.0 J µg/L (MW-29D) to 1,300 µg/L (MW-27D). These results are consistent with historical detections. Boron results from the August 2020 compliance and NES sampling are presented in Figures 5, 11, and 12.

- Cobalt was detected at concentrations exceeding the background-based federal CCR GWPS and solid waste permit GPS of 7.83 µg/L at North Pond compliance well MW-24 during the first semi-annual monitoring event conducted in March 2020 and the second semi-annual monitoring event conducted in August 2020. Concentrations of cobalt detected in groundwater in the vicinity of the North Pond during the March, April (verification event), and August 2020 events ranged from 0.18 µg/L (MW-33) to 61.9 µg/L (MW-24). The concentration of cobalt at MW-24 has been increasing since June of 2017. Cobalt results from the August 2020 compliance and NES sampling events are presented in Figures 6 and 13.

- Lithium was detected at concentrations exceeding the federal CCR GWPS of 40 µg/L and the background-based solid waste permit GPS of 25 µg/L at North Pond compliance well MW-27D. Concentrations of lithium detected in groundwater in the vicinity of the North Pond during the March and August 2020 events ranged from an estimated value of 0.56 J µg/L (MW-29S) to 46.4 µg/L (MW-27D). As presented in Table 10, the lithium concentrations at MW-27D have been declining since June 2017. Lithium results from the August 2020 compliance and NES sampling events are presented in Figures 7 and 14.

- Molybdenum was detected at concentrations exceeding the background-based solid waste permit GPS of 16.4 µg/L at North Pond compliance well MW-27D during the March and August 2020 compliance events. Concentrations of molybdenum detected in groundwater in the vicinity of the North Pond during the March and August 2020 events ranged from an estimated concentration of 1.0 J µg/L (MW-34) to 19.8 µg/L (MW-27D). Molybdenum results from the August 2020 compliance and NES sampling events are presented in Figures 8 and 15.

- Nickel was detected at concentrations exceeding the background-based solid waste permit GPS of 7.9 µg/L at North Pond compliance well MW-33 during the March 2020 event. Concentrations of nickel detected in groundwater in the vicinity of the North Pond during the March and August 2020 events ranged from an estimated concentration of 1.2 J µg/L (MW-35) to 9.9 µg/L (MW-33). Nickel was not detected in groundwater above the solid waste permit GPS during the August 2020 compliance and NES sampling events. Nickel results from the August 2020 compliance and NES sampling events are presented in Figures 9 and 16.

- Silver was detected at concentrations exceeding the background-based solid waste permit GPS of 5.0 µg/L at North Pond compliance well MW-27D. The silver detection reported at well MW-27D (5.7 µg/L) was the only reported detection of silver during the March and August 2020 sampling events. Silver results from the August 2020 compliance and NES sampling events are presented in Figure 10. Due to the lack of GPS/GWPS exceedances during the NES work, no cross-section was prepared for silver.

3.3 Groundwater Chemistry

Supplemental groundwater geochemistry parameters were collected during the routine monitoring events conducted at the North Pond in January 2019 and August 2020. This included the collection of common cations (sodium, potassium, calcium, and magnesium) and anions (alkalinity as calcium carbonate, chloride, and sulfate). These supplementary sampling results for select North Pond wells are summarized in Table 11. Additionally, concurrent geochemistry monitoring results for select North Pond pumping wells (installed in CCR materials) are also included in Table 11 for comparison.

To assist with the evaluation of geochemistry at the North Pond, a series of Stiff, Schoeller, scatter, and Piper diagrams were prepared using the common cations and anions summarized above. Stiff diagrams are graphical representations of chemical analyses that are used to display the major ion composition of individual water samples. Stiff diagrams appear as polygons, with cations plotting on the left, and anions plotting on the right. Stiff diagrams can be used to make rapid visual comparisons between different water samples, where samples that plot with similar polygonal shapes have similar geochemistry and may originate from the same source. Similarly, visual comparison of Stiff diagrams can identify samples with mixed sources based on the characteristic shapes of plots from distinct sources. Schoeller plots are line plots where cations and anions are plotted on the x-axis and concentrations are plotted on the y-axis and are useful for illustrating relative constituent ratios between samples that can be useful in identifying source waters. Scatter plots graphically illustrate the relationship between different cations and anions and can be useful for identifying mixing of source waters. Piper diagrams are graphical representations of water chemistry where ratios of cations (calcium, magnesium, and sodium plus potassium) and anions (chloride, sulfate, and carbonate plus bicarbonate) are plotted on separate ternary plots, which are then projected onto a diamond. Piper diagrams are useful for comparing the ionic composition of a large set of water samples.

A Piper Diagram presenting the samples that were analyzed for cations and anions during this project is presented in Chart 1. As presented, the three interstitial water samples from the ash plot close together as expected and the five impacted wells, MW-24, MW-27D, MW-33, MW-34, and MW-35, plot away from the interstitial water, with MW-33, MW-34, and MW-35 plotting with a group of several wells closer to where upgradient well MW-11 plots. MW-27D plots in close proximity to upgradient well MW-29D, suggesting a similar source water. Review of the Stiff diagrams presented in Chart 2 shows that the interstitial water from the ash exhibits a strong calcium-bicarbonate signature, whereas the upgradient groundwater is highly variable, presumably due to the variable mineralogy of the local geology and/or variable local land use, and ranges from a magnesium-carbonate facies for MW-11 to a sodium-chloride facies for MW-29S, and a sodium-bicarbonate facies for MW-29D. Charts 3 and 4 present the remaining wells that were evaluated during this investigation. As presented, with the exception of MW-27D and MW-36S, the majority of the wells exhibit a calcium-bicarbonate dominated water facies, suggesting potential influence from the North Pond. Monitoring well MW-27D has a sodium-bicarbonate-sulfate facies that closely

resembles the results at upgradient well MW-29D. Observation wells MW-36S has a magnesium-bicarbonate facies which is similar to the upgradient well MW-11 facies.

Chart 5 illustrates the geochemical facies for the surface water and HZ sample locations. As presented, the surface water and hyporheic zone monitoring locations SW-1/HZ-1, SW-2/HZ-2, which were collected in the drainage near MW-36S and MW-36D, reflects a calcium-sulfate facies in the hyporheic samples, and the surface water sample taken at SW-2 exhibits a common calcium-sulfate facies. The surface water sample collected at SW-1 exhibits a calcium-magnesium-bicarbonate facies. Hyporheic zone monitoring locations HZ-3 and HZ-4 were collected in the drainage below MW-24. The hyporheic sample HZ-3 exhibits a calcium-sodium-potassium-magnesium-sulfate facies and HZ-4 exhibits magnesium-bicarbonate facies.

In summary, the upgradient groundwater geochemistry at the Station is highly variable ranging from magnesium-bicarbonate to sodium-potassium-chloride to sodium-potassium-bicarbonate. The variability in the geochemistry is likely associated with variable land use and geology. The interstitial pore water from the ash has a strong calcium-bicarbonate geochemical signature that is significantly different from that observed in the upgradient groundwater. The downgradient and sidegradient wells near the North Pond, with exception of MW-27D and MW-36S, generally have a calcium-sodium-bicarbonate geochemical water facies. The similarity of the downgradient geochemical facies with the pore water geochemical facies suggest a similar source water or potential mixing of interstitial pore water with upgradient water.

Downgradient monitoring well MW-27D has a sodium-bicarbonate-sulfate geochemical facies and observation well MW-36S has strong magnesium-calcium-bicarbonate facies. These wells' chemistries resemble that observed in background wells MW-29D and MW-11, respectively.

The surface water samples generally have a calcium-magnesium-bicarbonate or calcium-sulfate water facies. The HZ sample ports generally have a calcium-sodium-potassium-magnesium-sulfate facies. The groundwater facies for the surface water and HZ points are distinctly different from those observed in the interstitial pore water and the downgradient groundwater, suggesting that interstitial pore water is not mixing with shallow groundwater in measurable quantity.

To further evaluate this relationship, common cations and anions detected in the North Pond source area pumping wells, North Pond wells, and upgradient wells were plotted on a Schoeller plot. As illustrated in Chart 6, the results for MW-24, MW-27D, MW-33, MW-34, and MW-35 (highlighted as red crosses) closely mirror the results for the North Pond pumping wells (orange circles), with the exception of the sodium and sulfate results in MW-27D. This suggests that these wells are potentially impacted by water from the North Pond source area. This is supported by the results of scatter plots presented in Charts 7 and 8, where the impacted wells typically plot closest to the North Pond pumping wells, both when evaluating common cations and anions, and common cations and anions versus boron. Additionally, scatter plots in Charts 7 and 8 typically show that other North Pond wells (blue crosses) plot closer to upgradient wells (pink circles), which may suggest that solid waste permit GPS or federal CCR GWPS

exceedances (for boron and cobalt) at these locations are potentially related to natural sources rather than the North Pond source area.

4.0 NATURE AND EXTENT OF CONSTITUENTS OF CONCERN

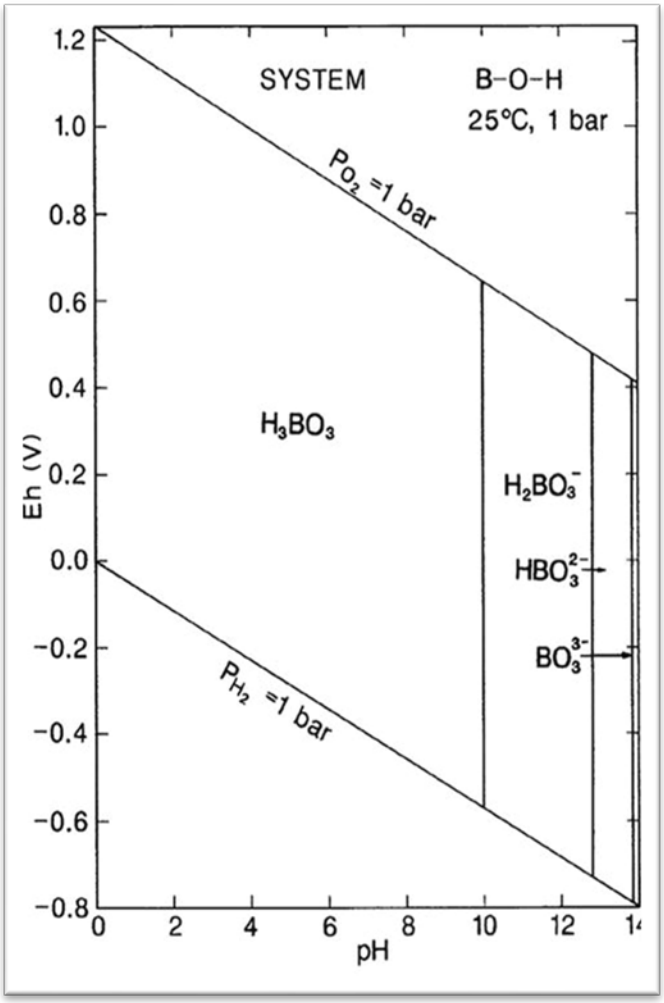
4.1 Boron

4.1.1 Nature of Boron

Boron is included as an Appendix III constituent in 40 CFR Part 257 because historically it has been detected at CCR disposal sites and has been identified as an inorganic parameter known to be a leading indicator of releases of contaminants associated with CCR (USEPA, 2015). Boron is a naturally occurring, non-metallic element found in rocks, soil, and water. Boron has an oxidation state of +3 and does not exist as a pure element in nature. Rather, it is combined with oxygen as borate minerals and various boron compounds such as boric acid, borax, and boron oxide. Under ambient conditions the boron compounds are found in crystalline form or as granules or amorphous powders. Borate minerals and other boron compounds are ubiquitous, and are found in high concentrations in marine deposits, sedimentary rocks, coal, shale, geothermal fluids, and naturally boron-rich mineral deposits and the soils derived from those mineral deposits (USEPA, 2008). Boron is widely distributed in nature at concentrations approaching 30 parts per million (ppm) in some geologic formations (Moore *et al*., 1997). Boron concentrations in rocks range from 5 ppm in basalts to 100 ppm in shales, and the average concentration in the earth's crust is 10 ppm (Woods, 1994). Boron concentrations in freshwater normally range from <10 to 1,500 µg/L (Woods, 1994). Based on the observed groundwater concentrations and groundwater geochemistry at the Station, an average soil source concentration of 0.46 milligrams per kilogram (mg/kg) would provide a sufficient natural source to generate the observed groundwater concentrations.

Boron may be released into the environment as a result of natural weathering of geologic formations, burning of coal in power plants, and by activities associated with chemical plants and manufacturing facilities. Fertilizers, herbicides, and industrial wastes are also among the sources of boron soil contamination (USEPA, 2008). Contamination of water can come directly from industrial wastewater and municipal sewage, as well as indirectly from air deposition and soil runoff (USEPA, 2008). Borates in detergents, soaps, and personal care products can also contribute to the presence of boron in the environment. Elemental boron is insoluble in water and boric acid and borax are only slightly soluble in water. Boron can be present in drinking water from both naturally occurring and man-made sources.

Boron speciation is controlled by acidity, with the noncharged species, boric acid, predominant at lower pH relative to the charged borate ion (Harkness, 2016). The borate ion is more likely to coprecipitate into secondary phases, and therefore, dissolved boron concentrations are lower at high pH (Harkness, 2016). As illustrated in the inset Eh-pH diagram (Brookins, 1988) under natural groundwater and surface water conditions (pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts) found in central Virginia, boron is found almost exclusively as boric acid in the natural environment.



A historical background study of naturally occurring boron in Virginia soils found concentrations in the Piedmont physiographic region ranging from below detection (*i.e.,* less than 20 mg/kg) up to 30 mg/kg (Shacklette *et al.*, 1984). A limited set of site-specific soil samples collected in the vicinity of the North Pond in 2018 (Golder, 2019), and found boron was detected in two of 12 soil samples, at concentrations ranging from 3.2 J to 5.7 J mg/kg. Using standard soil-water partitioning calculations and concentrations of boron detected in site specific samples, expected groundwater concentrations of boron were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for boron (0.19 L/kg; Whelan *et al.,* 1996). Using the site-specific soil concentrations reported above (*i.e.*, 3.2 J to 5.2 J mg/kg), the predicted concentrations of boron in groundwater range from approximately 17,000 µg/L to 27,000 µg/L. Based on these estimated values, it is probable that the boron detected in groundwater at the Station may in part be associated with a natural geologic source.

4.1.2 Estimated Boron Migration Rate

To assist with understanding the fate and transport characteristics of COCs, Golder evaluated the expected groundwater retardation coefficients for boron in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula.

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where: R = Retardation Coefficient
p = media bulk density (kilograms per liter [kg/L])
K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
ne = effective porosity (unitless)

The results of the evaluation for boron are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Boron (oxyanion)	0.19 (1)	2.6	0.2	3.5	28.8%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Whelan, G., J.P. McDonald, and C. Sato. 1996. *Multimedia Environmental Pollutant Assessment System (MEPAS): Groundwater Pathway Formulations.* United States Department of Energy, Contract No. DE-AC06-76RLO 1830. Pacific Northwest National Laboratory, Operated by Battelle for the United States Department of Energy. June.

As presented, boron is expected to migrate as an oxyanion in groundwater at approximately 29% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the boron migration rate relative to the advective groundwater flow rate.

4.1.3 Extent of Boron

A summary of the recent detections of boron in groundwater samples from the vicinity of the North Pond is included in Table 10. Boron was detected at concentrations in exceedance of the background-based solid waste permit GPS (250 µg/L) in groundwater in samples collected from North Pond CCR compliance wells MW-27D, MW-34, and MW-35 in March 2020, and in compliance wells MW-27D, MW-33, MW-34, and MW-35, and observation wells MW-22D, and MW-36D in August 2020. These wells generally span the length of the downgradient berm of the North Pond, from northwest to southeast. The most elevated groundwater results for boron are observed at MW-27D and MW-34, with concentrations decreasing to the northwest and southeast.

As presented in Figure 5, boron is horizontally delineated to the GPS with the existing North Pond CCR compliance wells and observation wells, and surface water monitoring results. These results, along with the historical North

Pond source area boron results and the geochemical signature evaluation described in Section 3.3, suggest a likely source water impact related to North Pond CCR materials.

Figures 11 and 12 present cross-sections A-A', B-B', C-C', and D-D', showing subsurface hydrogeologic conditions approximately parallel to groundwater flow direction (southwest) in the vicinity of the North Pond Wells. Additionally, on Figure 12, cross-section E-E' shows hydrogeologic conditions approximately perpendicular to groundwater flow along the North Pond berm. The inferred vertical extent of boron (delineated to the solid waste permit GPS) was interpolated with data from North Pond compliance wells and observation wells, surface water monitoring results, and vertical gradient estimates, which suggest an upward flow component in the vicinity of East Pond. This interpretation is consistent with the Site Conceptual Model which indicates that the James River is a receiving stream system such that the vertical flow of groundwater within the aquifer beneath the river is upward, thus limiting the potential for additional lateral (trans river) migration or vertical (downward) migration of the boron oxyanion.

Based on interpolated and extrapolated contouring developed from the sampling data, horizontal and vertical hydraulic gradients, and the estimated migration rate of boron in groundwater, the inferred extent of the boron concentrations exceeding the solid waste permit GPS in groundwater was delineated horizontally and vertically. Boron impacts are believed to be localized to the immediate vicinity of the North Pond, centered MW-27D and MW-35 as shown on Figures 5, 11, and 12. As presented in Section 5.0, the potential offsite migration of boron is unlikely to pose an unacceptable risk to potential receptors, as the exposure pathway is incomplete.

Of interest, boron concentrations at impacted wells downgradient from the North Pond have generally been observed to remain stable since maximum concentrations were reported during 2018 monitoring events, as summarized in Table 10, and depicted in Chart 9 (following).

Chart 9: Boron Concentration Timeseries at North Pond Downgradient Monitoring Wells

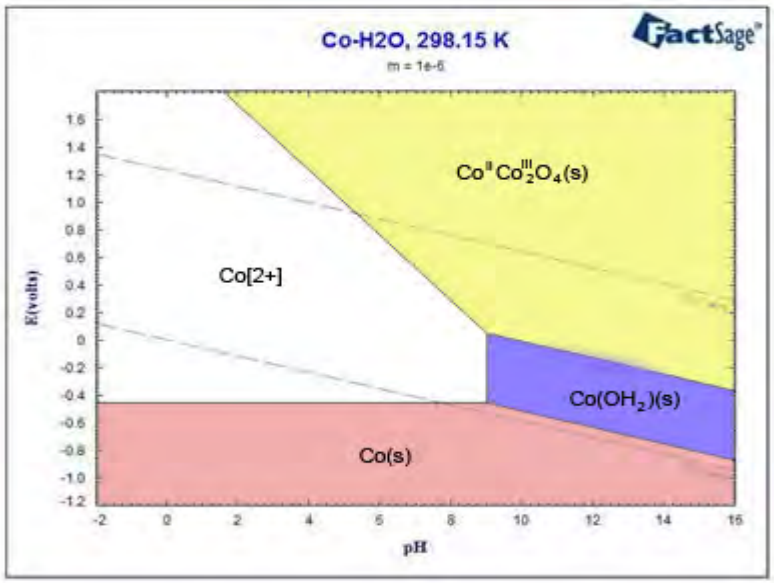
4.2 Cobalt

4.2.1 Nature of Cobalt

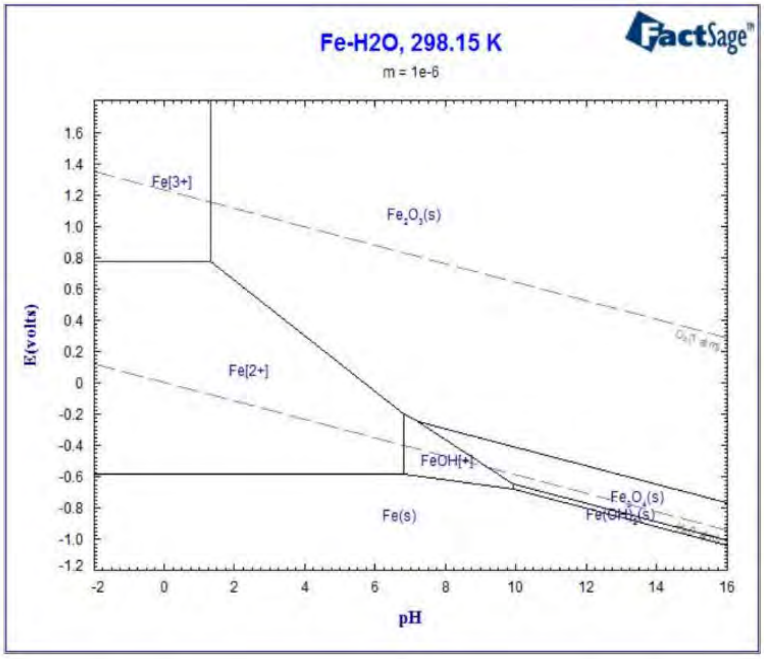
Cobalt is a naturally occurring metal found in soil and rock and is commonly associated with minerals and ores that contain copper and nickel. In addition to industrial uses, the Agency for Toxic Substances and Disease Registry (ATSDR) notes in the public health statement for cobalt that cobalt is an essential vitamin for plant and animal nutrient uptake. For most humans, food is the largest source of cobalt intake. Cobalt is a part of essential vitamin B_{12} (found in meat and dairy products) which is needed to maintain human health. The average person consumes approximately 11 micrograms of cobalt a day in their diet (ATSDR, April 2004).

The transport of metals, like cobalt, in groundwater is influenced by the interaction of several factors including complexation reactions in water, redox-related processes, pH, adsorption, and precipitation. Mineral surfaces generally strongly adsorb metal ions, although this adsorption is highly dependent upon the mineral assemblage of the soil and the composition of the groundwater. The transport of metals in groundwater can increase when metals are complexed with binding ligands, either naturally present or introduced as contamination (Herbert *et al*., 1993).

As illustrated in the inset Eh-pH diagram to the right from FactSage™ for cobalt, under natural groundwater and surface water conditions found in Virginia (*i.e.,* pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts), cobalt is typically found almost exclusively in its divalent free ionic form in the natural environment. However, cobalt (and other divalent metals) is known to strongly absorb to iron oxyhydroxide minerals that are naturally present in sedimentary aquifers, such as the alluvium and saprolite aquifers observed in the vicinity of the North Pond.



As illustrated in the inset Eh-pH diagram below from FactSage™ for iron, groundwater in central Virginia typically falls near the Ferrous and Ferric iron transition boundary. As such, even *de minimis* changes in groundwater quality (pH and Eh) associated with land-use changes or other activities can result in the dissolution (and corresponding release of absorbed cations) or precipitation (and corresponding absorption of divalent cations) of iron oxyhydroxide minerals.



A historical background study of naturally occurring cobalt in Virginia soils found concentrations in the Piedmont physiographic region ranging from below detection (*i.e.,* less than 3 mg/kg) up to 30 mg/kg (Shacklette *et al*., 1984). More recently, an average cobalt concentration in soils in Virginia of 9.9 mg/kg with a standard deviation of 11.6 mg/kg (Smith *et al*., 2013) was established. Using standard soil-water partitioning calculations and published concentrations of cobalt in soil for Virginia, expected groundwater concentrations of cobalt were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for cobalt (37.15 L/kg; Buchter *et al.,* 1989). Using the using the upper and lower confidence limit concentrations of the Virginia soil data presented above (*i.e.*, 8.6 to 11.2 mg/kg), the predicted concentrations of cobalt in groundwater range from approximately 231 µg/L to 301 µg/L. These results suggest that even a relatively low concentration of cobalt in native soil at the North Pond, given the observed groundwater geochemistry, could produce the observed cobalt groundwater concentrations. Therefore, it is probable that the cobalt detected in groundwater at the North Pond is associated with a natural geologic source.

4.2.2 Estimated Cobalt Migration Rate

To assist with understanding the fate and transport characteristics of the COCs, Golder evaluated the expected groundwater retardation coefficients for cobalt in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula:

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where:
- R = Retardation Coefficient
- p = media bulk density (kilograms per liter [kg/L])
- K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
- ne = effective porosity (unitless)

The results of the evaluation for cobalt are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Cobalt (divalent cation)	37.15 (1)	2.6	0.2	484.0	<1%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Buchter, B., B. Davidoff, M.C. Amacher, C. Hinz, I.K. Iskandar, and H.M. Selim. 1989. Correlation of Freundlich Kd and n_e Retention Parameters with Soils and Elements. *Soil Science*. Vol. 148, No. 5. November.

As presented, cobalt is expected to migrate as a divalent cation at a rate of less than 1% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the cobalt migration rate relative to the advective groundwater flow rate.

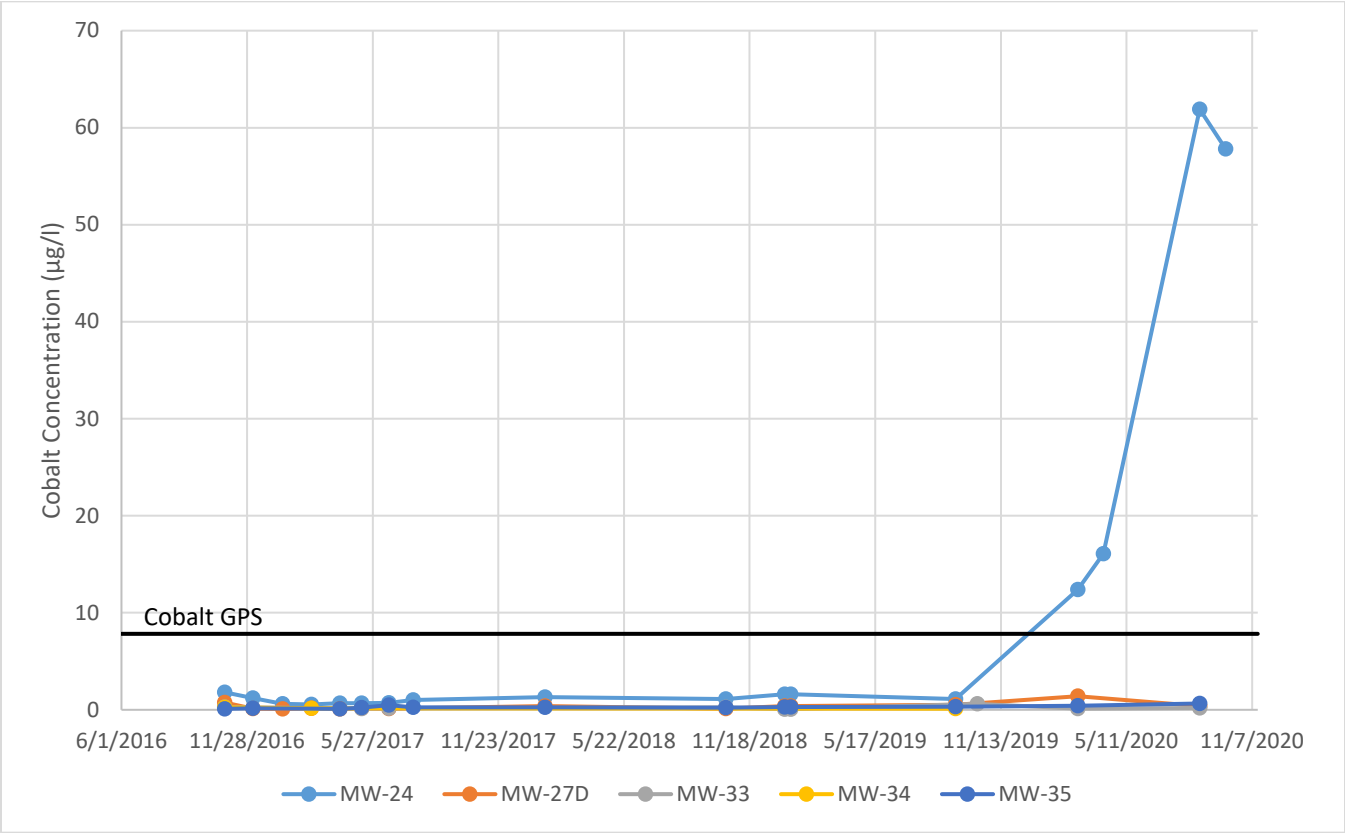
4.2.3 Extent of Cobalt

A summary of the recent detections of cobalt in groundwater samples from the vicinity of the North Pond is included Table 10. As presented, cobalt was detected at a concentration in exceedance of the background-based federal CCR GWPS and background-based solid waste permit GPS of 7.83 µg/L for groundwater in samples collected from compliance well MW-24 in March 2020. This concentration was not consistent with historical results but was confirmed with a verification sample taken in April 2020 and subsequently in August 2020. This well is located in the southernmost area of the downgradient berm of the North Pond. An evaluation of regional soil data as described above suggests that some of the cobalt detected in groundwater in the vicinity of the North Pond may be attributed to a geological source.

As presented in Figure 6, the inferred horizontal extent of cobalt (delineated to the federal CCR GWPS and solid waste permit GPS) was interpolated based on data from North Pond compliance and observation wells and surface water monitoring results. Hydrogeologic cross-section E-E', showing subsurface hydrogeologic conditions approximately perpendicular to groundwater flow direction (southwest) in the vicinity of the North Pond, along with cobalt monitoring data, is presented in Figure 13. Cobalt concentrations in groundwater downgradient of the East Pond are discussed in the September 2020 Nature and Extent Study – East Pond (Golder, 2020), which is being submitted under separate cover.

Additionally, cobalt concentrations at the impacted well (MW-24) in the North Pond area have previously been observed to be at estimated concentrations below the laboratory RL or at quantified concentrations below the federal CCR GWPS/solid waste permit GPS. Timeseries of cobalt data at North Pond area wells with current or historical GWPS/GPS exceedances are depicted in Chart 10 following. The observed trends likely reflect the variable geochemical conditions in the aquifer resulting from a combination of Station actions and on-going remedial actions associated with the North Pond, including installation of a rain cover and active CCR material dewatering. These variable conditions likely resulted in the dissolution of iron oxyhydroxide minerals and the release of the relatively immobile divalent cobalt ion to the groundwater. Based on the recent conversion of the East Pond to a stormwater management basin, it is expected that geochemical conditions favorable for formation of iron oxyhydroxide minerals will re-establish resulting in the removal of dissolved cobalt ions from the groundwater via mineral sorption processes.

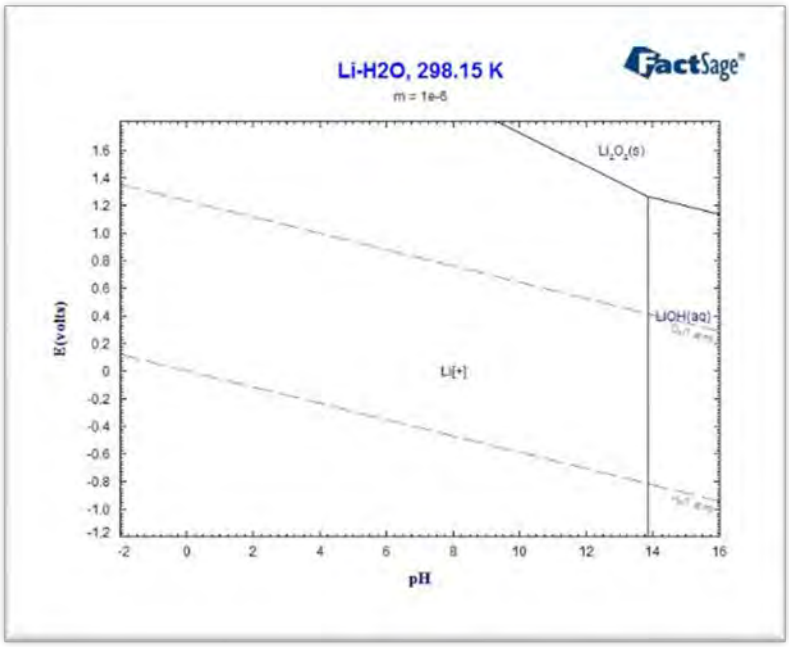
Chart 10: Cobalt Concentration Timeseries at North Pond Downgradient Monitoring Wells



4.3 Lithium

4.3.1 Nature of Lithium

Lithium is an alkali metal found naturally in the Earth's crust. Lithium in nature occurs predominantly in silicate minerals, and is a common accessory element in feldspar, biotite mica, amphibole, and clay minerals (Reeder, 2006). The abundance of lithium in soil can vary considerably; lithium content of a soil is influenced more by the conditions under which the soil was formed than by the content of the original parent rock (Yalamanchali, 2012). Lithium is used in batteries, glass and ceramic production, in lubricants used in high-temperature environments, and in pharmaceuticals (Yalamanchali, 2012).



As illustrated in the inset Eh-pH diagram from FactSage™ under natural groundwater and surface water conditions (pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts) found in central Virginia, lithium is found almost exclusively in its univalent free ionic form in the natural environment. When not dissolved in the water column, it is considered relatively immobile because its fluoride, carbonate, and phosphate compounds (*i.e.*, minerals) generally have low solubilities. Chemical and physical weathering of these minerals from igneous rocks and from secondary clay minerals, especially at low pH levels (Lyons and Welch, 1997) will release the lithium ion into solution. As a result, lithium is found naturally occurring in groundwater (VDH, 2011).

Lithium is included as an Appendix IV constituent in 40 CFR Part 257 because it has historically been detected at CCR disposal sites at concentrations exceeding the USEPA's Regional Screening Level (RSL) for soil to groundwater, and because lithium has the potential to be toxic if consumed with certain drug types (USEPA, 2015).

A historical background study of naturally occurring lithium in Virginia soils found concentrations ranging from 6 to 100 mg/kg, with concentrations in the Piedmont physiographic region ranging from 6 up to 20 mg/kg (Shacklette *et al.*, 1984). More recently (Smith *et al.*, 2013) a Virginia background concentration of 23.9 mg/kg with a standard deviation of 18 mg/kg was established. This is higher than the range of concentrations (0.99 to 5.6 mg/kg) reported in a limited set of site-specific soil samples collected in the vicinity of the North Pond in 2018 (Golder, 2019). Using standard soil-water partitioning calculations and concentrations of lithium in site soil, expected groundwater concentrations of lithium were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for lithium (1.25 L/kg; Yalamanchali, 2012). Using the site-specific soil data presented above (*i.e.*, detected concentrations ranging from 0.99 to 5.6 mg/kg), the predicted concentrations of lithium in groundwater range from approximately 792 µg/L to 4,480 µg/L. An average soil concentration of 0.41 mg/kg would provide a sufficient natural source for the observed groundwater concentrations at the site. Based on these results, the lithium detected in the impacted wells may in part be associated with a natural geologic source.

4.3.2 Estimated Lithium Migration Rate

To assist with understanding the fate and transport characteristics of the COCs, Golder evaluated the expected groundwater retardation coefficients for lithium in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula.

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where: R = Retardation Coefficient
p = media bulk density (kilograms per liter [kg/L])
K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
ne = effective porosity (unitless)

The results of the evaluation for lithium are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Lithium (univalent cation)	1.25 (1)	2.6	0.2	17.3	5.8%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Yalamanchali, R.C.. 2012. *Lithium, an emerging environmental contaminant, is mobile in the soil-plant system*. Masters Thesis. Lincoln University.

As presented, lithium is expected to migrate as a univalent cation at approximately 6% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the lithium migration rate relative to the advective groundwater flow rate.

4.3.3 Extent of Lithium

A summary of the recent detections of lithium in groundwater samples from the vicinity of the North Pond is included in Table 10. As presented in the 2019 ACM, Lithium was detected at concentrations in exceedance of the federal CCR GWPS and the current Virginia CCR GWPS (was not in effect at the time of the initial exceedance) for groundwater in ACM investigation samples collected from North Pond CCR compliance wells MW-27D and MW-35 in January 2019, consistent with assessment monitoring results from 2018. An evaluation of limited soil sampling results at downgradient boundary wells MW-36S and MW-36D suggested that some of the lithium detected in groundwater in the vicinity of the North Pond may be attributed to a geological source. However, lithium was detected at either low-level, estimated concentrations, or not detected above the laboratory MDL, in upgradient monitoring wells MW-11, MW-29S, and MW-29D.

Lithium was detected at concentrations in exceedance of the federal CCR GWPS (40 µg/L) and solid waste permit GPS (25 µg/L) in groundwater samples collected from compliance well MW-27D (46.4 µg/L) in March 2020. As presented in Table 10, the lithium concentrations at MW-27D have been declining since the summer of 2017. Aside from an October 2018 sample collected from MW-35, which was addressed in the 2019 ACM, the lithium concentrations in the North Pond compliance wells are currently below the GWPS and GPS.

Well MW-27D is located to the west of the North Pond. A plan view isoconcentration map for lithium groundwater concentrations in North Pond area monitoring wells is presented in Figure 7. As presented, lithium is horizontally delineated to the GPS/GWPS within the existing CCR compliance wells, downgradient boundary wells (*i.e.,* MW-36S and MW-36D), and sentinel wells. In addition to groundwater concentrations, Figure 7 presents the results for lithium monitoring in the surface water and hyporheic zone samples collected during the 2020 NES investigation and the interstitial pore water samples collected in 2019 for reference. As presented, no lithium GPS/GWPS exceedances were reported for boundary wells MW-36S and MW-36D downgradient of MW-27D or in surface water downgradient from MW-27D.

Hydrogeologic cross-section B-B', showing subsurface hydrogeologic conditions approximately parallel to groundwater flow direction (southwest) in the vicinity of MW-27D is presented in Figure 14. The vertical extent of lithium in the vicinity of MW-27D is delineated by paired shallow monitoring well MW-27S and downgradient boundary wells MW-36S and MW-36D and closure demonstration well MW-40. Hydrogeologic cross-section D-D', showing subsurface hydrogeologic conditions approximately parallel to groundwater flow direction in the vicinity of MW-27D illustrate that lithium impacts are localized around MW-27D. As depicted in cross section, in the vicinity of MW-27D, lithium is not detected above the GPS/GWPS in nearby shallow wells or in downgradient deep bedrock well MW-36D.

As presented in Section 3.1.3, and illustrated in Figure 14, a slight downward vertical gradient was measured in August 2020 between the shallow/partially weathered bedrock (MW-27S) and fractured bedrock (MW-27D) west of the North Pond. Similarly, a slight upward gradient is shown near MW-36S/MW-36D. As illustrated in Figure 14, the vertical gradient is expected to invert and trend upward near MW-36S/MW-36D such that these wells are ideally positions to detect lithium migration in this direction. As illustrated in Figures 7 and 14, lithium is not detected at concentrations exceeding the GPS/GWPS at deep downgradient boundary well MW-36D, where vertical gradients are more strongly upward, reflective of groundwater discharge to surface water in the vicinity. Elevated concentrations of lithium observed at MW-27D may be the result of preferential groundwater flow from the North Pond area along a steeply dipping, east-west oriented fracture intersecting the well screen zone at MW-27D.

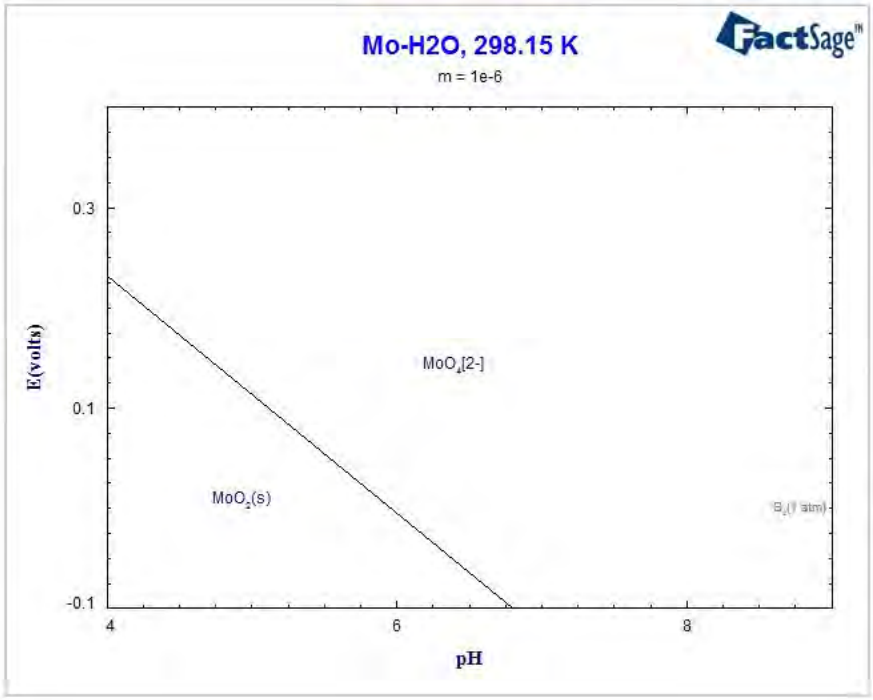
Based on the August 2020 sampling results in the vicinity of MW-27D, the exceedance of the lithium GPS/GWPS in groundwater is localized around MW-27D and does not extend significantly vertically or horizontally from this monitoring point. Based on these data, there is no indication that lithium impacts above GWPS have migrated further downgradient of MW-27D.

4.4 Molybdenum

4.4.1 Nature of Molybdenum

Molybdenum is included as an Appendix IV constituent in 40 CFR Part 257 as historically it has been detected at CCR disposal sites and is relevant to risk assessment and damage cases (USEPA, 2015). Molybdenum is a naturally occurring metal found in the Earth's crust. It is found in minerals, rocks, and soils as well as in aqueous form; however, it does not occur naturally as a free metal. Estimates of crustal abundance have been put at around 0.6 - 1.5 mg/kg (Hu, *et al.*, 2008; Taylor, 1964). Within Virginia, the USGS reported an average molybdenum concentration in Virginia soils (based on 16 samples) of less than 3 mg/kg (Shacklette, 1984). More recent studies (Smith et al., 2013) identified a mean concentration of 1.03 mg/kg for soils in Virginia based on analysis of 132 samples. Overall, this is consistent with the limited evaluation of site soils adjacent to North Pond at the Station where concentrations of molybdenum ranged from below the MDL (<0.12 mg/kg) to 0.76 mg/kg (Golder, 2019).

Molybdenum is released into soil and water as a result of industrial activity and natural environmental conditions due to anthropogenic and geologic sources. Contamination of water through geologic sources includes degradation of organic matter and natural weathering processes. Anthropogenic sources of molybdenum include impacts from metal sulfide mining, the combustion of fossil fuels, and discharges from industrial operations (Smedley, *et al.*, 2017).



As illustrated in the inset Eh-pH diagram from FactSage™ (Bale *et al.*, 2016) under natural groundwater and surface water conditions (pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts) found in central Virginia, molybdenum is found almost exclusively as the stable molybdate ion in the natural environment. Molybdenum is a redox-sensitive element that forms highly insoluble minerals under certain reducing conditions. Under most oxidizing conditions (typical pH greater than 6), the molybdate ion is expected to be the dominant solution species (Smedley, *et al.*, 2017). Molybdate transport in groundwater is retarded by sorption, depending on the pH, adsorbent contents (including clay, iron, aluminum oxides, iron sulfide, manganese oxides, and organic matter) of soils, and the influence of the competitive adsorption of other anions (Xu, *et al.*, 2013).

Using standard soil-water partitioning calculations and detected concentrations of molybdenum in site soil, expected groundwater concentrations of molybdenum were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for molybdenum (64.42 L/kg; Buchter, *et al.,* 1989). Using the site-specific soil data presented above (*i.e.*, detected concentrations ranging from 0.16 J to 0.76 mg/kg), the predicted concentrations of molybdenum in groundwater range from approximately 2.5 µg/L to 12 µg/L. These results suggest that some of the molybdenum detected in the impacted wells may in part be associated with a natural geologic source. However, molybdenum has either not been detected or detected at concentrations below the solid waste permit GPS and federal CCR GWPS at upgradient wells (MW-11, MW-29S, and MW-29D) during recent monitoring events. Furthermore, concentrations of molybdenum observed at MW-27D are elevated compared to other North Pond wells, with the exception of historical concentrations at MW-24, and, as presented in Table 7, are lower than molybdenum concentrations reported for interstitial pore water samples (SDW-4, SDW-7) installed within CCR material at the North Pond (Golder, 2019). Molybdenum concentrations at these North Pond pumping wells ranged from 103 µg/L to 140 µg/L for SDW-4 and SDW-7, respectively and 9.6 µg/L for SDW-10 in January 2019, compared to current concentrations of boron at MW-27D (19.8 µg/L in March 2020 and 16.8 µg/L in August 2020). Comparison to North Pond source area pumping wells suggests that groundwater at MW-27D is likely impacted by molybdenum that has been leached from CCR materials.

4.4.2 Estimated Molybdenum Migration Rate

To assist with understanding the fate and transport characteristics of the COCs, Golder evaluated the expected groundwater retardation coefficients for molybdenum in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula.

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where:
- R = Retardation Coefficient
- p = media bulk density (kilograms per liter [kg/L])
- K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
- ne = effective porosity (unitless)

The results of the evaluation for molybdenum are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Molybdenum (oxyanion)	64.42 (1)	2.6	0.2	838.4	<1%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Buchter, B., B. Davidoff, M.C. Amacher, C. Hinz, I.K. Iskandar, and H.M. Selim. 1989. Correlation of Freundlich Kd and n_e Retention Parameters with Soils and Elements. *Soil Science*. Vol. 148, No. 5. November.

As presented, molybdenum is expected to migrate as an oxyanion at a rate of less than 1% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the molybdenum migration rates relative to the advective groundwater flow rate.

4.4.3 Extent of Molybdenum

A summary of the recent detections of molybdenum in groundwater samples from the vicinity of the North Pond is included in Table 10. Molybdenum was detected at concentrations in exceedance of the background-based solid waste permit GPS (16.4 µg/L) in groundwater in the sample collected from compliance well MW-27D (19.8 µg/L) in March 2020, consistent with recent historical monitoring results. Molybdenum is typically not detected or detected at concentrations well below the GPS and GWPS at the remaining North Pond wells, with the exception of historical detections at MW-24.

As presented in Figure 8, the inferred horizontal extent of molybdenum (delineated to the solid waste permit GPS) is based on interpolation and extrapolation of data from North Pond compliance and observation wells and downgradient surface water monitoring results. As presented, the extent of the groundwater impacts associated with molybdenum are limited to the area near MW-27D.

The historical North Pond source area molybdenum results and the geochemical signature evaluation described in Section 3.3, suggest a likely source water impact at MW-27D related to North Pond CCR material. As previously described, the locally elevated results at MW-27D compared to other downgradient North Pond wells may indicate that, consistent with the 2019 linear feature analysis presented in Section 3.1, northeast-southwest trending fractures intersected by these wells are providing a preferential pathway for groundwater flow from the North Pond area. While not expected based on geochemical modeling, lateral migration of molybdenum within the aquifer matrix could be expected in a fractured medium if geochemical conditions conducive for dissolution of iron oxyhydroxide minerals are present.

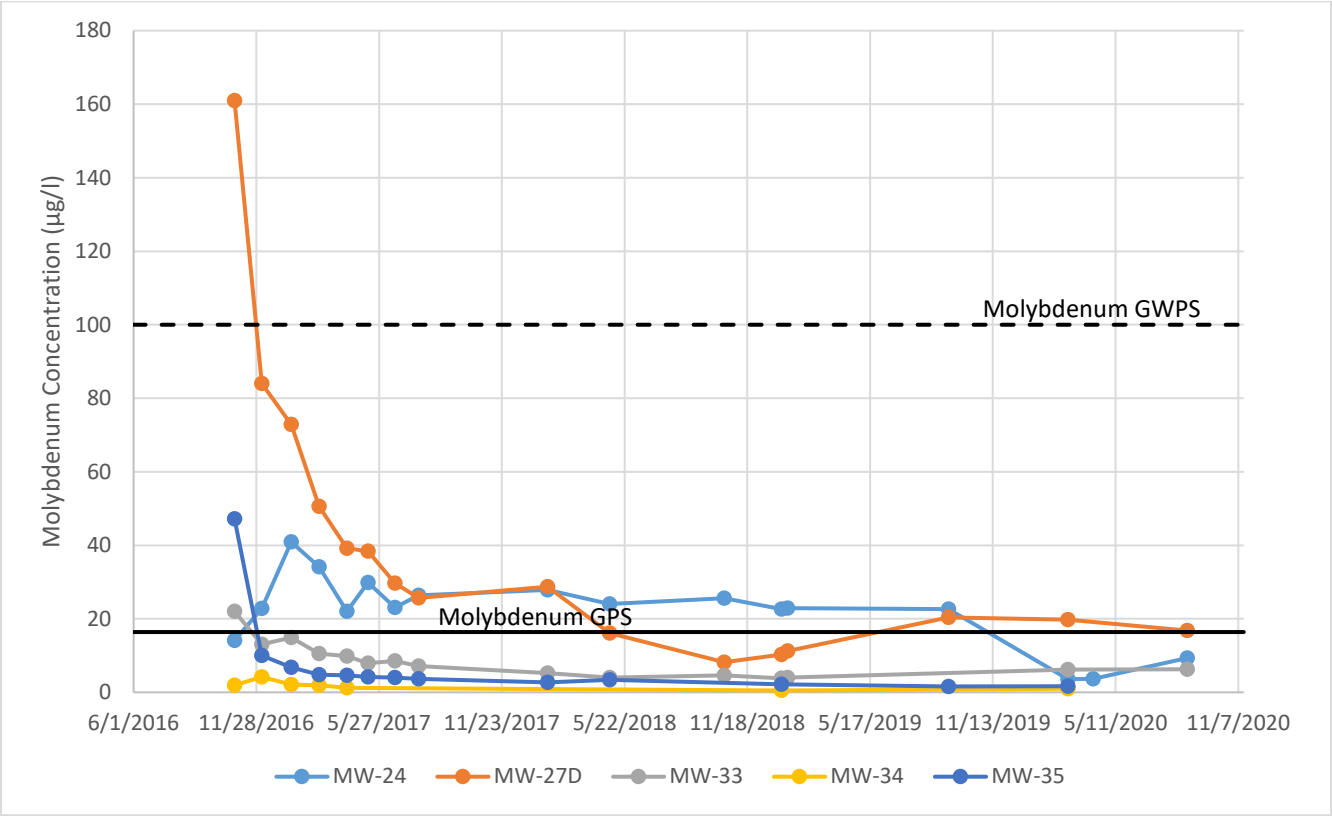
Hydrogeologic cross-sections B-B’ and D-D’, showing subsurface hydrogeologic conditions approximately parallel to groundwater flow direction (southwest) in the vicinity of the North Pond are presented in Figure 15. The inferred

vertical extent of molybdenum (delineated to the solid waste permit GPS) is based on interpolation and extrapolation of data from North Pond compliance wells and observation wells, surface water monitoring results, and geochemical modeling results that indicate the molybdenum would be attenuated over a relatively short distance.

Based on interpolated contouring developed surface water and groundwater concentrations, horizontal and vertical hydraulic gradients, and the low (<1% of groundwater flow velocity under non-turbulent flow conditions) estimated molybdenum migration rate in groundwater, the approximately extent of the solid waste permit GPS exceeding concentrations for molybdenum in groundwater is delineated horizontally and vertically. Molybdenum impacts are believed to be localized to the immediate vicinity of MW-27D as shown on Figures 8 and 15. The source of the molybdenum impacts at MW-27D is believed to be local to these wells and is unlikely to be associated with the pore water from the North Pond. This interpretation is consistent with the Site Conceptual Model which indicates that the James River is a receiving stream system such that the vertical flow of groundwater within the aquifer beneath the river is upward, thus limiting the potential for additional lateral (trans river) migration or vertical (downward) migration of the molybdenum cation.

Overall, molybdenum concentrations at MW-27D have been declining since a maximum concentration of 161 µg/L was reported in October 2016. Chart 11 (following) depicts concentrations of molybdenum at MW-27D since sampling for CCR Appendix IV constituents was initiated in 2016. These trends likely reflect a combination of Station actions, including on-going remedial actions associated with the North Pond and installation of a rain cover and active CCR material dewatering.

Chart 11: Molybdenum Concentration Timeseries at North Pond Downgradient Monitoring Wells

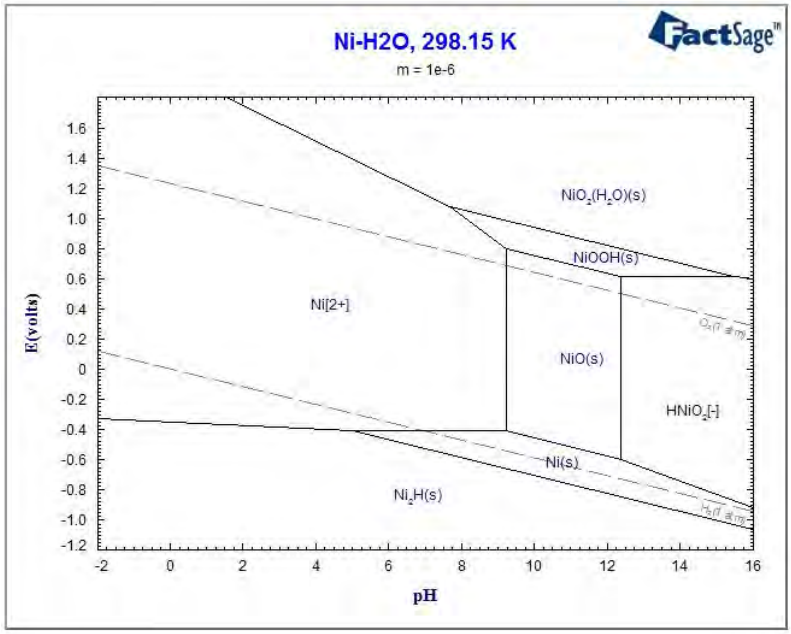


4.5 Nickel

4.5.1 Nature of Nickel

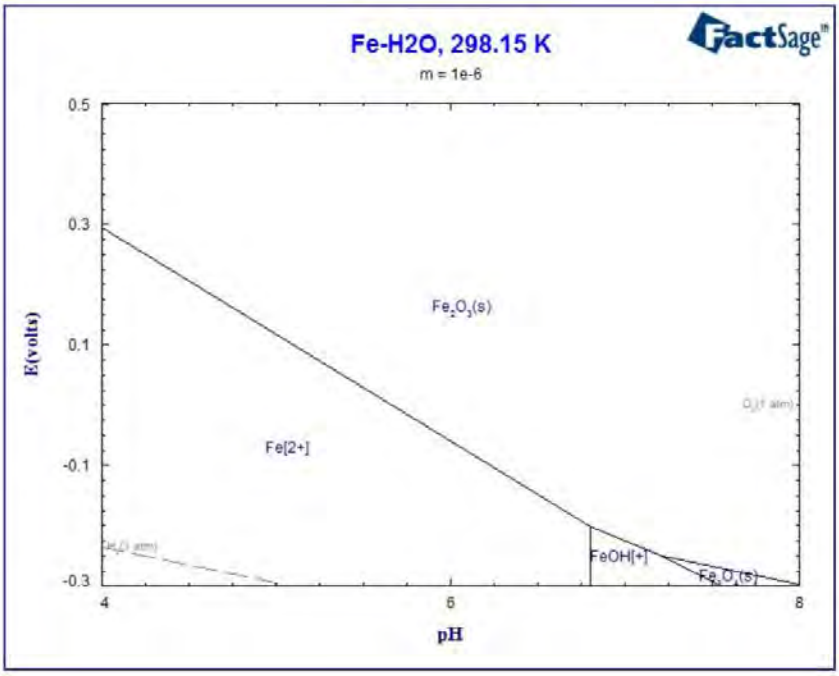
Nickel is included in the Station's SWP as a required sampling constituent pursuant to X.I.F.3 in the solid waste permit. Nickel is a trace element found at minor concentrations in coal ash (USGS, 2015). Nickel is a relatively minor constituent of the earth's crust, ranking 24th in terms of abundance (EPA, 2007). Nickel is a naturally occurring, metallic element found in soils, rocks, and as nickel ore. Nickel is heterogeneously distributed among crustal rocks ranging from 0.0001% in sandstone and granite to 4% in ore deposits (Duke, 1980). In soils, nickel ranges from 5 – 500 mg kg^{-1}, with serpentine clay-rich soils having the greatest abundance of geogenic nickel (Lindsay, 1979; Chaney *et al*., 1995).

Nickel is released into the soil and water as a result of industrial activity and natural environmental conditions due to anthropogenic and geogenic sources. Contamination of water through geogenic sources includes natural weathering processes, soil runoff, and precipitation. Anthropogenic sources of nickel include the burning of coal and other fossil fuels and discharges from industries such as electroplating and smelting (EPA, 1986). As presented in Table 7, the North Pond CCR material is not expected to be a major source of nickel.



Nickel is one of the most mobile of the heavy metals in the aquatic environment. The mobility of nickel in groundwater is controlled by partitioning reactions to aquifer sediments. Possible reactions include direct adsorption to clay minerals, adsorption or coprecipitation with metal oxides, complexation with natural organic particles, ion exchange with charged surfaces, and direct precipitation as a hydroxide, carbonate or sulfide (Snodgrass, 1980). As illustrated in the inset Eh-pH diagram for nickel (Bale *et al.*, 2016) under natural groundwater and surface water conditions (pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts) found in central Virginia, nickel is found almost exclusively as a cationic species (Ni2+) in the natural environment.

Nickel may be immobilized within groundwater through the formation of pure nickel precipitates such as hydroxides, silicates, or sulfides or through coprecipitation with other soil forming minerals such as silicates, iron oxides/sulfides, or carbonates (EPA, 2007). Nickel has been shown to adsorb onto many solid components encountered in aquifer



sediments, including iron/manganese oxides (Dähn *et al*., 2003). As illustrated in the inset Eh-pH diagram for iron (Bale *et al*., 2016) under natural groundwater and surface water conditions (pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts) found in central Virginia, iron is found primarily as an iron oxide (Fe_2O_2) in the natural environment. Sorption to iron oxides and clay minerals has shown to be of importance in controlling nickel mobility in subsurface systems (EPA, 2007).

A historical background study of naturally occurring nickel in Virginia soils found concentrations in the Piedmont physiographic region ranging from below detection (*i.e.,* less than 5 mg/kg) up to 70 mg/kg (Shacklette *et al*., 1984). More recently, an average nickel concentration in soils in Virginia of 16.8 mg/kg with a standard deviation of 17.7 mg/kg (Smith *et al*., 2013) was established based on 132 samples. Using standard soil-water partitioning calculations and published concentrations of cobalt in soil for Virginia, expected groundwater concentrations of cobalt were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for nickel (36.31 L/kg; Buchter *et al.,* 1989). Using the using the upper and lower confidence limit concentrations of the Virginia soil data presented above (*i.e.*, 14.8 to 18.8 mg/kg), the predicted concentrations of cobalt in groundwater range from approximately 408.3 µg/L to 517.1 µg/L. These results suggest that even a relatively low concentration of nickel in native soil at the North Pond, given the observed groundwater geochemistry and recent land-disturbing activities, could produce the observed nickel groundwater concentrations. Therefore, it is probable that the nickel detected in groundwater at the Nickel Pond is associated with a natural geologic source.

4.5.2 Estimated Nickel Migration Rate

To assist with understanding the fate and transport characteristics of the COCs, Golder evaluated the expected groundwater retardation coefficients for nickel in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula.

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where: R = Retardation Coefficient
p = media bulk density (kilograms per liter [kg/L])
K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
ne = effective porosity (unitless)

The results of the evaluation for nickel are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Nickel (divalent cation)	36.31 (1)	2.6	0.2	473.0	<1%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Buchter, B., B. Davidoff, M.C. Amacher, C. Hinz, I.K. Iskandar, and H.M. Selim. 1989. Correlation of Freundlich Kd and n_e Retention Parameters with Soils and Elements. *Soil Science*. Vol. 148, No. 5. November.

As presented, nickel is expected to migrate as a divalent cation at a rate of less than 1% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the nickel migration rates relative to the advective groundwater flow rate.

4.5.3 Extent of Nickel

A summary of the recent detections of nickel in groundwater samples from the vicinity of the North Pond is included in Table 10. Nickel was detected at a concentration in exceedance of the background-based solid waste permit GPS of 7.9 µg/L for groundwater in the sample collected from compliance well MW-33 in March 2020 (9.9 µg/L). The reported concentration was relatively elevated compared to historical results at MW-33 and was not confirmed by the August 2020 results suggesting the March 2020 exceedance was a false-positive laboratory result. This well is located along the southwestern portion of the downgradient berm of the North Pond. An evaluation of regional soil data as described above suggests that some of the nickel detected in groundwater in the vicinity of the North Pond may be attributed to a geological source.

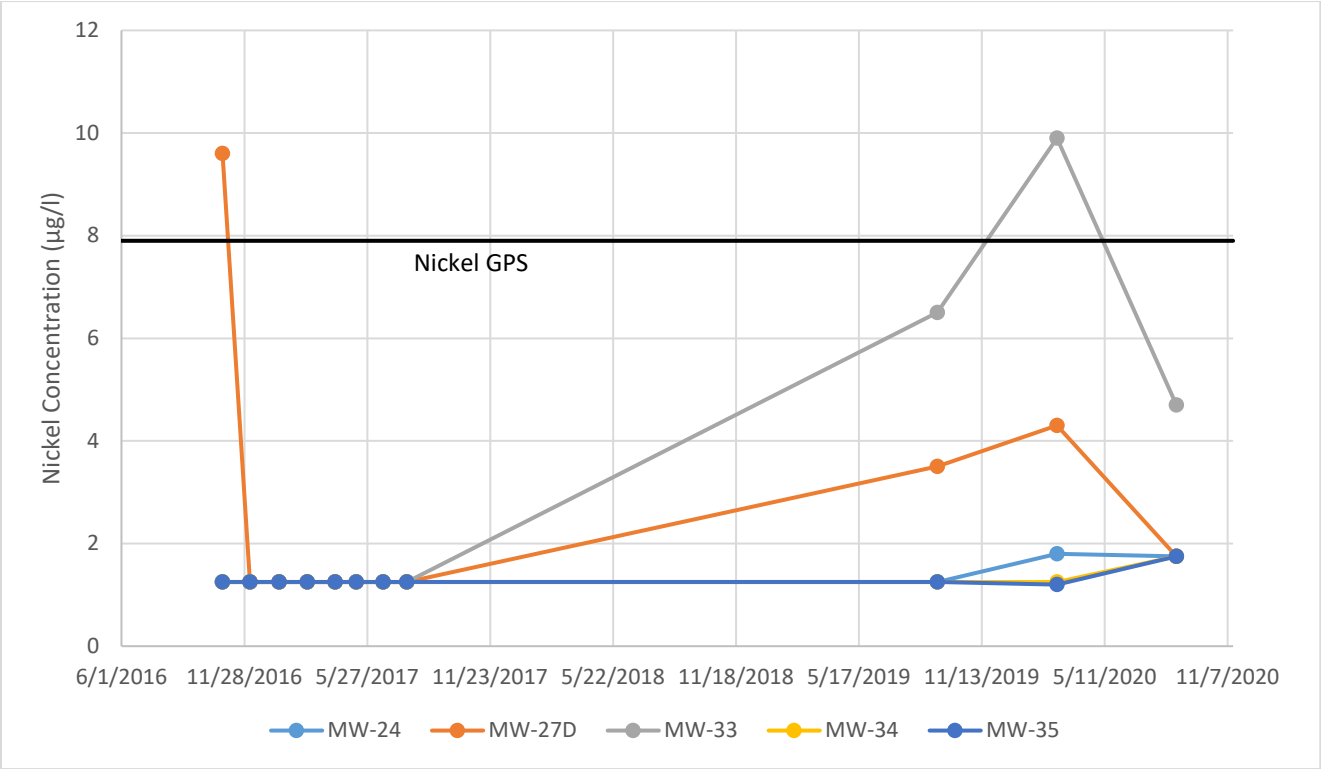
As presented in Figure 9, the inferred horizontal extent of nickel (delineated to the solid waste permit GPS) was interpolated based on data from North Pond compliance and observation wells and surface water monitoring results. As previously described, nickel was not detected at quantified concentrations in surface water downgradient of the North Pond. As discussed in Section 5.0, this potential offsite migration is unlikely to pose an unacceptable risk to potential receptors, as the exposure pathway is incomplete.

Hydrogeologic cross-section D-D', showing subsurface hydrogeologic conditions approximately parallel to groundwater flow direction (southwest) in the vicinity of the North Pond, along with nickel monitoring data, is presented in Figure 16. Additionally, cross section E-E' in Figure 16 shows hydrogeologic conditions approximately perpendicular to groundwater flow along the North Pond berm. The inferred vertical extent of nickel in the vicinity of the North Pond is delineated by MW-40, and the absence of nickel in downgradient surface water monitoring results downgradient of impacted wells.

Based on interpolated contouring developed from surface water and groundwater data, vertical gradients, and the low (<1% of groundwater flow velocity) estimated nickel migration rate in groundwater, the nickel concentrations exceeding the solid waste permit GPS in groundwater are believed to be localized to the immediate vicinity of the North Pond berm, and are unlikely to extend significantly beyond the boundary of the ash pond. This interpretation is consistent with the Site Conceptual Model which indicates that the James River is a receiving stream system such that the vertical flow of groundwater within the aquifer beneath the river is upward, thus limiting the potential for additional lateral (trans river) migration or vertical (downward) migration of the nickel ion.

Additionally, nickel concentrations at the impacted well in the North Pond area have previously been observed to be at estimated concentrations below the laboratory RL or at quantified concentrations below the solid waste permit GPS. Timeseries of nickel data at MW-27D with current or historical solid waste permit exceedances are depicted in Chart 12 following. The observed trends likely reflect the variable geochemical conditions in the aquifer resulting from a combination of Station actions and on-going remedial actions associated with the North Pond, including installation of a rain cover and active CCR material dewatering. These variable conditions likely resulted in the dissolution of iron oxyhydroxide minerals and the release of the relatively immobile divalent nickel ion to the groundwater. Based on the recent conversion of the East Pond to a stormwater management basin, it is expected that geochemical conditions favorable for formation of iron oxyhydroxide minerals will re-establish resulting in the removal of dissolved nickel ions from the groundwater via mineral sorption processes.

Chart 12: Nickel Concentration Timeseries at North Pond Downgradient Monitoring Wells



4.6 Silver

4.6.1 Nature of Silver

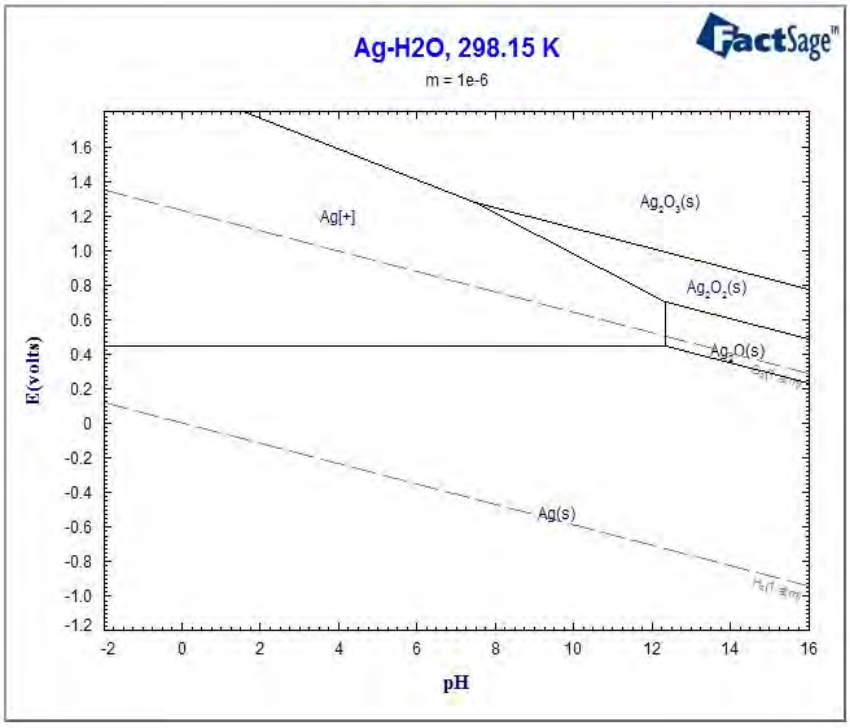
Silver is a naturally occurring metal found in soil and rock, mainly occurring in the minerals argenite and stephanite. Silver in its metallic form is primarily used in jewelry, silverware, and alloys. Silver compounds are used extensively in the production of photographic film and electronic components. In soils, it is mainly present in sulfide minerals. Water soluble silver compounds include silver chloride, silver nitrate, silver oxide, and silver fluorides. Silver can be found at solid waste sites in the form of these compounds mixed with soil and/or water (ATSDR, 1990). Silver concentrations in rocks range from 0.04 ppm in granites to 0.1 ppm in basalts with the average concentration in the Earth's crust is 0.1 ppm (Taylor, 1964).

Silver is released into the environment largely through human industry. Sources of silver release to water sources include sewage treatment, textile plant wastewater effluent, petroleum refinery effluent, and fly ash scrubber water effluent from municipal incinerators (ATSDR, 1990). As presented in Table 7, the North Pond CCR material is not expected to be a source of silver.

The transport of metals, like silver, in groundwater is influenced by the interaction of several factors including complexation reactions in water, redox-related processes, pH, adsorption, and precipitation. Mineral surfaces generally strongly adsorb metal ions, although this adsorption is highly dependent upon the mineral assemblage of

the soil and the composition of the groundwater. The transport of metals in groundwater can increase when metals are complexed with binding ligands, either naturally present or introduced as contamination (Herbert *et al*., 1993).

As illustrated in the inset eh-pH diagram from FactSage™ (Bale *et al.*, 2016), under natural groundwater and surface water conditions found in Virginia (*i.e.,* pH of 4 to 9 Standard Units and Eh of -0.1 to 0.4 volts), silver is found in its free metallic form in the natural environment. The free metallic form and silver sulfides predominates the silver compounds found in surface water and souls under reducing conditions (Lindsay and Sadiq, 1979). Based on evaluation of the oxidation reduction potential and pH of the groundwater at MW-27D, silver is not expected to be present as a dissolved univalent ion. Consequently, the unconfirmed exceedance of the background-based solid waste permit GPS is likely associated with a false-positive laboratory result or colloidal/turbidity transport. Additionally, pH conditions, which determine the reactivity of iron and manganese complexes, and the presence of organic matter can affect the mobility of silver in groundwater (Boyle, 1968). As such, even *de minimis* changes in groundwater quality (pH and Eh) associated with land-use changes, other activities, or even natural season variations in groundwater quality can affect the mobility of silver in groundwater.



A historical background study of naturally occurring silver in Virginia soils found that silver was not commonly detected in soils and therefore reliable mean concentrations were unable to be calculated. In this historical study, only one sample in Virginia, located in the southwestern highlands, had a reported silver concentration of 3.0 mg/kg (Shacklette *et al*., 1984). More recently, based on 132 samples, silver concentration in soils in Virginia were reported at less than 1.0 mg/kg (Smith *et al*., 2013).

Using standard soil-water partitioning calculations and published concentrations of silver in soil for Virginia, expected groundwater concentrations of nickel were estimated using the following relationship between soil and water concentrations:

$$K_d(L/kg) = {[Concentration\ in\ Soil\ (mg/kg)]}/{[Concentration\ in\ Water\ (mg/L)]}$$

Where K_d is the soil-water partitioning coefficient for silver (2.6 L/kg; Allison *et. al*, 2005). Assuming the upper and lower confidence limit concentrations of the Virginia soil data presented above (*i.e.*, 1.0 to 1.04 mg/kg), the predicted concentrations of silver in groundwater, based on the assumed concentrations, range from approximately 2.5 µg/L to 2.6 µg/L. These results suggest silver is present in relatively low concentrations in Virginia soils. As presented in Table 10, this is consistent with historical results for silver, where detected, at the North Pond and the most recent sampling results for silver at the North Pond results in no detections above the laboratory MDL.

4.6.2 Estimated Migration Rate of Silver

To assist with understanding the fate and transport characteristics of the COCs, Golder evaluated the expected groundwater retardation coefficients for silver in the alluvial and saprolitic aquifer matrix materials using publicly available data and the following formula.

$$R = 1 + \frac{pKd}{ne} = \frac{(Velocity\ of\ Groundwater)}{(Velocity\ of\ Contaminant)}$$

Where:
R = Retardation Coefficient
p = media bulk density (kilograms per liter [kg/L])
K_d = Soil-Water partitioning coefficient (liters per kilogram [L/kg])
ne = effective porosity (unitless)

The results of the evaluation for silver are summarized in the following table.

Constituent of Concern	K_d (L/kg) with Data Source	Bulk Density (kg/L)	Effective Porosity (unitless)	Retardation Coefficient (unitless)	Fraction of Groundwater Velocity
Silver (elemental)	2.60 (1)	2.6	0.2	5,176.4	<1%

Note: Soil-water partitioning coefficients (K_d) estimated based on groundwater pH of 6 to 7.5 standard units and redox potential of 0 to 100 millivolts.

Data Sources:

1. Allison, J. D. and T.L. Allison. 2005. *Partition Coefficients for Metals in Surface Water, Soil, and Waste*. U.S Environmental Protection Agency. July.

As presented, silver is expected to migrate in its elemental form at a rate of less than 1% of the groundwater flow velocity. These results indicate that natural sorption processes are expected to significantly retard the silver migration rates relative to the advective groundwater flow rate.

4.6.3 Extent of Silver

A summary of the recent detections of silver in groundwater samples from the vicinity of the North Pond is included in Table 10. Silver was detected at concentrations in exceedance of the background-based solid waste permit GPS

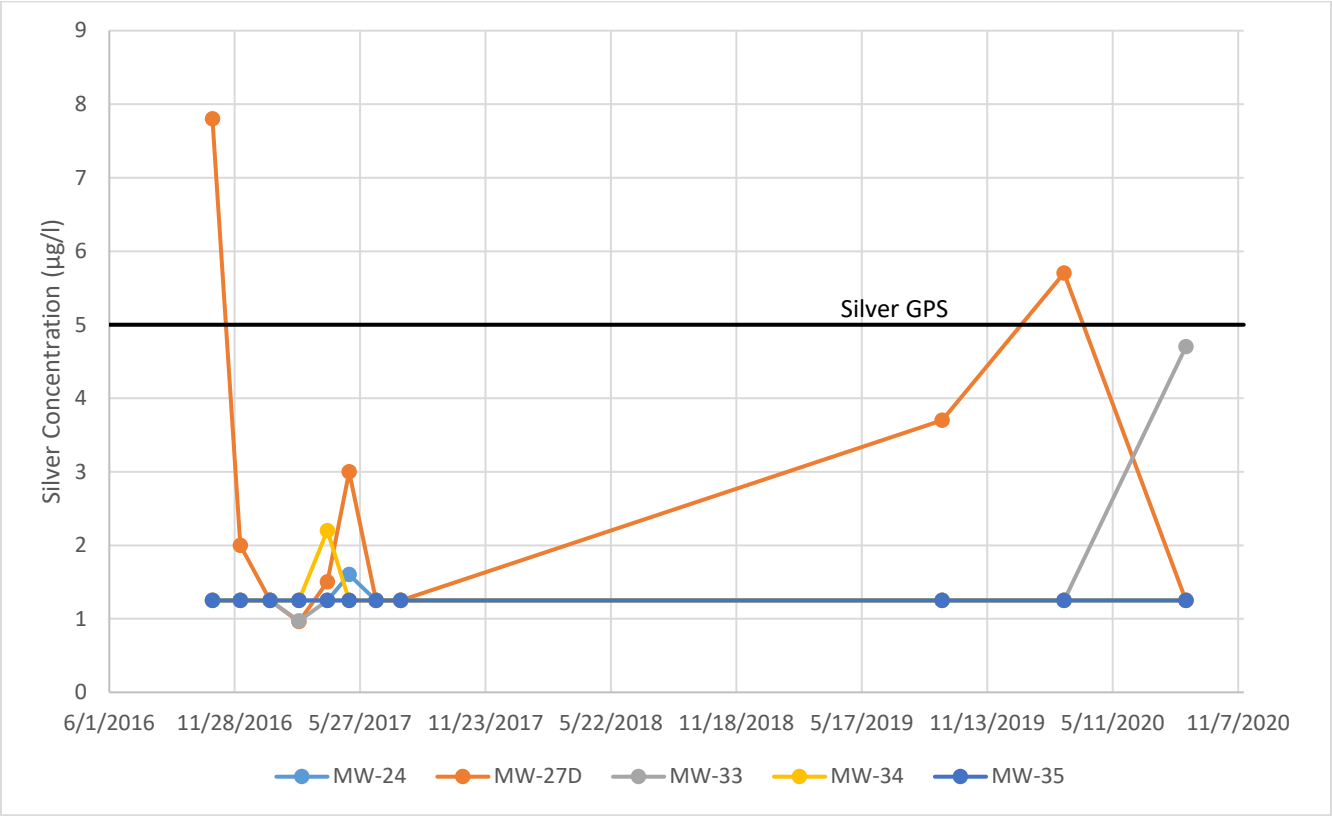
of 5.0 µg/L for groundwater in the sample collected from compliance well MW-27D in March 2020. The March 2020 concentration as reported was higher than recent historical silver results from this well and was not confirmed during the August 2020 sampling event. This well is located along the western portion of the downgradient berm of the North Pond. An evaluation of regional soil data as described above suggests that the silver detected in groundwater in the vicinity of the North Pond may be attributed to a geological source; however, the historical sampling results coupled with eth August 2020 sampling results suggest that the March 2020 result was a false-positive result associated with laboratory or sampling error.

As presented in Figure 10, silver was not detected above the laboratory MDL in the samples used for preparation of this NES Addendum. Based on the results presented herein, the March 2020 GPS exceedance is attributed to either laboratory or field error and the suspect GPS exceedance is not considered to be confirmed at this time.

Based on horizontal and vertical gradients, the low (<1% of groundwater flow velocity) estimated silver migration rate in groundwater, and historical data, any future silver concentrations exceeding the solid waste permit GPS in groundwater are expected to remain localized to the North Pond and are unlikely to migrate significantly beyond the boundary of the ash pond. This interpretation is consistent with the Site Conceptual Model which indicates that the James River is a receiving stream system such that the vertical flow of groundwater within the aquifer beneath the river is upward, thus limiting the potential for additional lateral (trans river) migration or vertical (downward) migration of silver.

A timeseries chart with silver data for the compliance wells is depicted in Chart 15 following. The observed trends likely reflect the variable geochemical conditions in the aquifer resulting from a combination of Station actions and on-going remedial actions associated with the North Pond, including installation of a rain cover and active CCR material dewatering, and/or may be associated with false positive results due to laboratory or sampling error as discussed previously.

Chart 13: Silver Concentration Timeseries at North Pond Downgradient Monitoring Wells



5.0 RISK ASSESSMENT

The following sections discuss the Risk Assessment prepared in support of the ACM conducted for the North Pond at the Station in Bremo Bluff, Virginia.

5.1 Purpose

The risk assessment provides an evaluation of potential risk associated with the Station's North Pond. The objective of the risk assessment is to provide an estimate of the magnitude of risk reduction that will be achieved by implementing the selected corrective measure. To meet this objective a baseline quantitative risk assessment for existing on-site potential human exposure to the COCs was completed based on the three components of risk using Virginia Unified Risk Assessment Model (VURAM) equivalent to a Tier III Risk Assessment under the Virginia Department of Environmental Quality (DEQ) Voluntary Remediation Program (VRP). The reduction in risk achieved by the remedy was then evaluated by assuming an end point concentration equal to the GPS. The difference in risk between the two scenarios defines the approximate magnitude in the risk reduction.

5.2 Scope

The risk assessment is specific to the North Pond, and has been prepared for selected potential exposure pathways and receptors using the data developed under the groundwater compliance monitoring program(s) and the assessment activities conducted during the preparation of the ACM. The assessment addresses human health risks. For risk to exist, three components are required: the COC, a receptor, and an exposure pathway for the receptor. If one or more of these listed components of risk are absent, risk does not exist.

5.2.1 Constituents of Concern

The COCs for this Station are constituents from which non-carcinogenic or carcinogenic risk may develop for a receptor following exposure. For this evaluation, the COCs are the constituents that have exceeded a GWPS/GPS, which include boron, cobalt, lithium, molybdenum, nickel, and silver.

5.2.2 Receptors

Receptors are usually biological and for this evaluation are limited to human receptors. Potential receptors at this Station include:

- Residential (Adult and Child)
- Commercial / Industrial (Adult)
- Site Construction Worker (Adult)
- Recreational (Adult and Child)
- Trespasser (Adult and Child)

5.2.3 Pathways

Pathways are routes by which exposure occurs (*e.g.*, ingestion or dermal exposure to an impacted medium, such as soil or groundwater). Potential pathways include:

- Soil
- Groundwater
- Air (occupied zone)
- Surface water
- Sediment
- Food

5.3 Risk Evaluation

Based on the results of the updated NES field investigation, the horizontal and vertical extent of the lithium, molybdenum, and silver associated with the North Pond are localized around monitoring well MW-27D. Horizontal and vertical extents of cobalt and nickel are also localized around one monitoring well each, MW-24, and MW-33, respectively. The horizontal and vertical extent of exceeding boron concentrations extends along the southern berm of the North Pond and appear to extend southward and may overlap with impacts associated with the East Pond (Golder, 2020). Access to the Station and downgradient (railroad) property is restricted to the public and groundwater at the Station is not used as a potable water source. In addition, surface water samples collected during September 2020 from along the north shore of the James River (located 1400 to 1600 feet downgradient of the North Pond and thought to be the exchange point for groundwater flowing southwest across the Station) reported no detections of boron, cobalt, lithium, and silver and only estimated detections of molybdenum and nickel below the federal CCR GWPS and/or solid waste permit GPS. These results indicate that impacted groundwater is not reaching surface water at concentrations that could pose a risk to human health or the environment. Based on this, it is believed that the exposure pathways associated with groundwater are not complete at the North Pond. Therefore, no exposure pathway for the general public (e.g., recreational or trespasser accessing surface water, or a residential child or adult ingesting groundwater) is identified. Consequently, the current groundwater impacts associated with the COCs do not pose a risk to the general public.

A potential exposure pathway was identified for site workers, including construction contractors. Details for the potential exposure including media and potential routes of exposure are summarized in Table 12 following.

Table 12: Identified Potential Receptor(s) and Exposure Route(s)

General Location Relative to the Station	Medium	Potential Receptor	Potential Route
On-site	Groundwater	Site/Construction worker (adult)	■ Dermal contact ■ Incidental ingestion ■ Inhalation of vapors in a trench (applicable to mercury only)

For quantitative risk assessments, representative concentrations of COCs are typically either the maximum detected media concentration or the 95% upper confidence limit (UCL) of the mean. For simplicity and to provide a conservative approach in this Report, the maximum measured concentrations detected in recent compliance monitoring groundwater data (2020) and during the ACM field investigation activities, independent of sample location within the study area, were selected as the representative concentrations of COCs.

5.3.1 Human Health Risk Assessment Baseline Results

The evaluation of risk was conducted with the VURAM model and default exposure assumptions with the actual COC concentrations are described herein. The output reports for the baseline risk evaluation for potential human exposure are provided in Appendix H. A summary of the results is provided in the following table.

Table 13: Baseline Quantitative Human Health Risk Assessment Results

Scenario	Hazard Index (Threshold = 1.0)	Individual Carcinogenic COC Risk (Listed if >1.0E-05)	Cumulative Carcinogenic Risk (Referenced Threshold = 1.0E-04)
On-site construction worker receptor exposed to groundwater via dermal contact, incidental ingestion, and inhalation of vapors in a trench	0.00868	Not Applicable	Not Applicable

Note: Risk results in ***Bold Italics*** indicate a calculated exceedance of the referenced risk threshold

As presented above, the calculated hazard index for the evaluated receptors and exposure pathways does not exceed the threshold (1.0) for acceptable cumulative risk. Additionally, boron, cobalt, lithium, molybdenum, and nickel are non-carcinogenic COCs, and therefore do not present associated carcinogenic risk.

5.3.2 Human Health Risk Reduction Evaluation

To evaluate the magnitude of potential risk reduction achieved by the selected corrective measure, the baseline assessment was re-evaluated using exposure concentrations equal to the GPS. Specifically, the groundwater concentrations of the COCs were reduced from above-GPS concentrations of to the GPS. A summary of the GPS concentrations used in the RA are provided in the following table.

Table 14: Corrective-Action-Endpoint Quantitative Human Health Risk Assessment GPS Values

Constituent	GPS Exceedance Result (µg/L)	GPS (µg/L)
Boron	1,300	250
Cobalt	61.9	7.83
Lithium	45.1	25
Molybdenum	16.8	16.4
Nickel	9.9	7.9
Silver	5.7	5

Output reports for the corrective-action-endpoint VURAM evaluation for potential human exposure are provided in Appendix I. A summary of the results is provided in the following table:

Table 15: Corrective-Action-Endpoint Quantitative Human Health Risk Assessment Results

Scenario	Hazard Index (Threshold = 1.0)	Individual Carcinogenic COC Risk (Listed if >1.0E-05)	Cumulative Carcinogenic Risk (Referenced Threshold = 1.0E-04)	Magnitude of Hazard Index Risk Reduction
On-site construction worker receptor exposed to groundwater via dermal contact, incidental ingestion, and inhalation of vapors in a trench	0.00409	Not Applicable	Not Applicable	0.00459

Note: Risk results in ***Bold Italics*** indicate a calculated exceedance of the referenced risk threshold

As presented in the table above, the calculated hazard index for the corrective action remedial endpoint is 0.00409, representing a 0.00459-point reduction of the baseline hazard index, or an overall 53% reduction in the level of risk.

5.4 Risk Assessment Results

The results of the quantitative human health risk evaluation using the VURAM model for identified potential current receptors indicates an acceptable level of risk using representative concentrations of the COCs as measured in groundwater samples associated with the North Pond. A 0.00459-point reduction in the hazard index for non-carcinogenic risk (equivalent to a 53% reduction) is calculated upon the future attainment of groundwater corrective action goals.

Although boron, molybdenum, nickel, and silver concentrations in the vicinity of the North Pond exceed the Virginia Solid Waste Permit background-based GPS, neither current nor historical concentrations of boron, molybdenum, nickel, or silver exceed the USEPA risk-based Regional Screening Levels (RSLs) for boron (4,000 µg/L), molybdenum (100 µg/L), nickel (390 µg/L), or silver (94 µg/L) in drinking water, which are based on the conservative USEPA default exposure scenario for drinking water consumption and exposure. The solid waste permit GPS for boron is not a risk-based concentration but is a background-derived concentration based on a laboratory quantitation limit (QL) concentration that is not reflective of actual risk. The solid waste permit GPS for molybdenum, nickel, and silver are also not risk-based concentrations but are based on the background concentrations in the upgradient wells and are also not reflective of actual risk.

Current and historical concentrations of cobalt and lithium exceed the USEPA's risk-based RSLs for cobalt (6.0 µg/L) and lithium (40 µg/L) in drinking water. However, as previously discussed, these exceedances were localized around single wells MW-24 (cobalt) and MW-27D (lithium). As presented in this Report, potential offsite migration is unlikely to pose an unacceptable risk to potential receptors, as the exposure pathway is incomplete

In summary, based on a survey of current receptors, which recognizes Station security and the absence of groundwater use, the current COC concentrations do not pose an excessive risk to human health based on USEPA and DEQ acceptable risk thresholds.

6.0 CONCLUSIONS

The inferred vertical and horizontal extents of boron, cobalt, lithium, molybdenum, nickel and silver concentrations in groundwater downgradient of the North Pond which exceed the federal CCR GWPS and/or the solid waste permit GPS have been delineated consistent with regulatory requirements and industry standard practices.

Based on the delineation results, although boron concentrations in the vicinity of the North Pond exceed the GPS of 250 µg/L, neither current nor historical concentrations of boron exceed the USEPA risk-based RSL for boron in drinking water of 4,000 µg/L. The solid waste permit GPS for boron of 250 µg/L is not a risk-based concentration but is rather a background value based on a laboratory quantitation limit (QL) concentration that is not reflective of actual risk.

Based on the information evaluated during this study, the inferred extent of the background-based federal CCR GWPS and solid waste permit GPS exceeding cobalt concentrations in groundwater at the North Pond is believed to be localized around one compliance monitoring well, MW-24. A natural vadose zone geological source combined with transient geochemical conditions resulting in the dissolution of iron oxyhydroxide minerals is likely contributing to cobalt concentrations in the vicinity of MW-24 at the North Pond.

Based on the information evaluated during this study, the inferred extent of the federal CCR GWPS and background-based solid waste permit GPS exceeding lithium and background-based solid waste permit GPS molybdenum concentrations in groundwater at the North Pond are believed to be localized around one compliance monitoring well, MW-27D. While some of the lithium and molybdenum detected in groundwater at MW-27D may be related to a natural source, geochemical considerations indicate that there may be an additional source associated with the CCR material that is currently in the North Pond.

Reported results for nickel (MW-33) and silver (MW-27D) that exceeded the background-based solid waste permit GPS in March 2020 were relatively elevated compared to historical results at these wells. Additionally, the North Pond CCR material is not expected be a source of either nickel or silver. These exceedances were not confirmed during the August 2020 compliance groundwater monitoring event, suggesting that the March 2020 exceedances were false-positive laboratory results.

As presented in the risk assessment, the results of the quantitative human health risk evaluation using the VURAM model for identified potential current receptors indicates an acceptable level of risk using representative concentrations of the COCs as measured in groundwater samples associated with the North Pond. Based on a survey of current receptors, which recognizes Station security and the absence of groundwater use, the current COC concentrations do not pose an excessive risk to human health based on USPEA and DEQ acceptable risk thresholds.

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8.0 SIGNATURE SECTION

This Report has been prepared by a qualified groundwater scientist on behalf of Dominion Energy for the North Pond at the Bremo Power Station in Fluvanna County, Virginia. This document was prepared by qualified groundwater scientists and engineers who have received baccalaureate and/or post-graduate degrees in the natural sciences or engineering and who have sufficient training and experience in groundwater hydrology, engineering, statistical evaluations, and related fields as demonstrated by state professional registrations and completion of an accredited university program that enables sound professional judgments consistent with the industry standard of care for groundwater monitoring, contaminant fate and transport, environmental corrective actions, and cost estimate development.

Sincerely,

Golder Associates Inc.

Rachel I. Powell
Digitally signed by Rachel I. Powell
Date: 2021.10.29 11:00:50 -06'00'

Rachel I. Powell
Project Engineer

Michael G. Williams, C.P.G.
Digitally signed by Michael G. Williams, C.P.G.
Date: 2021.10.29 13:34:36 -04'00'

Michael G. Williams, C.P.G.
Principal and Practice Leader

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Tables

Table 2
Summary of Second Semi-Annual Modified Assessment Monitoring Program Sampling Event Data (August 2020)
Bremo Power Station, North Pond
Permit No 618

					Upgradient Wells												Downgradient Wells			
				Sample ID:	MW-11				MW-29S				MW-29D				MW-24			
				Sample Date:	08/24/2020				08/25/2020				08/25/2020				08/25/2020			
Parameter Name	**Units**	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix III Constituents																				
Boron	µg/L	QL (250)	--	250 (QL)	< 32.4		32.4	50.0	< 32.4		32.4	50.0	**47.0**	J	32	50	**210**		32.4	50.0
Calcium	µg/L	60,800	--	--	**20300**		94.0	100	**16000**		94.0	100	**44400**		94.0	100	**70300**		94.0	100
Chloride	mg/L	63.4	--	--	**8.8**		0.60	1.0	**27.7**		0.60	1.0	**39.5**		0.60	1.0	**33.0**		0.60	1.0
Fluoride	mg/L	0.15	4	4	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.12**		0.050	0.10	< 0.050		0.050	0.10
pH	SU	4.49-7.25	--	--	**8.07**		0.01	0.01	5.40		0.01	0.01	6.93		0.01	0.01	6.08		0.01	0.01
Sulfate	mg/L	179	--	--	**6.8**		0.50	1.0	**27.2**		0.50	1.0	**73.4**		0.50	1.0	**42.1**		0.50	1.0
Total Dissolved Solids	mg/L	612	--	--	**144**		25.0	25.0	**196**		25.0	25.0	**492**		50.0	50.0	**428**		50.0	50.0
CCR Appendix IV Constituents																				
Antimony	µg/L	QL (5)	6	6	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0
Arsenic	µg/L	QL (10)	10	10	< 4.7		4.7	10.0	**5.7**	J+	4.7	10.0	**6.6**	J	4.7	10.0	**7.7**	J+	4.7	10.0
Barium	µg/L	59.0	2,000	2,000	**3.6**	J	3.5	5.0	**40.4**		3.5	5.0	**39.6**		3.5	5.0	**98.5**		3.5	5.0
Beryllium	µg/L	QL (1)	4	4	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0
Cadmium	µg/L	1	5	5	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0
Chromium	µg/L	QL (5)	100	100	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0
Cobalt	µg/L	7.831	7.831	7.831	**0.60**		0.050	0.10	**0.28**		0.050	0.10	**0.26**		0.050	0.10	**61.9**		2.5	5.0
Fluoride	mg/L	0.15	4	4	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.12**		0.050	0.10	< 0.050		0.050	0.10
Lead	µg/L	QL (5)	15	5 (QL)	< 0.077		0.077	0.10	< 0.077		0.077	0.10	**0.19**		0.077	0.10	< 0.077		0.077	0.10
Lithium	µg/L	QL (25)	40	25 (QL)	< 0.39		0.39	2.5	**0.56**	J	0.39	2.5	**1.6**	J	0.39	2.5	**2.8**		0.39	2.5
Mercury	µg/L	QL (0.2)	2	2	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20
Molybdenum	µg/L	16.4	100	16.4	< 3.9		3.9	5.0	< 3.9		3.9	5.0	**7.8**		3.9	5.0	**9.3**		3.9	5.0
Selenium	µg/L	QL (10)	50	50	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	**5.3**	J	4.7	10.0
Thallium	µg/L	QL (1)	2	2	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Total Radium	pCi/L	1.39	5	5	**0.371**	U	1.01	1.01	**1.21**		1.06	1.06	**1.95**		1.01	1.01	**3.65**		1.52	1.52
Former VPDES Constituents																				
Ammonia	mg/L	--	--	--	< 0.070		0.070	0.10	< 0.070		0.070	0.10	**0.094**	J	0.070	0.10	**1.3**		0.070	0.10
Hardness	µg/L	--	--	--	**106000**		131	662	**53300**		131	662	**156000**		131	662	**222000**		131	662
Iron	µg/L	--	--	--	**593**		20.9	50.0	**268**		20.9	50.0	**926**		20.9	50.0	**17300**		1050	2500
Manganese	µg/L	--	--	--	**6.5**		0.47	0.50	**99.2**		0.47	0.50	**1300**		11.8	12.5	**3530**		23.6	25.0
Nitrate	mg/L	--	--	--	< 0.060		0.060	0.10	**4.7**		0.060	0.10	< 0.060		0.060	0.10	< 0.060		0.060	0.10
Speciation of Chromium																				
Hexavalent Chromium	µg/L	--	--	--	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0	**7.0**		5.0	5.0
VSWMR Constituents																				
Copper	µg/L	11.2	--	1,300	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Tin	µg/L	QL (5)	--	5 (QL)	< 0.24		0.24	0.50	< 0.24		0.24	0.50	**0.65**		0.24	0.50	< 0.24		0.24	0.50
Vanadium	µg/L	22.5	--	22.5	**11.3**		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Zinc	µg/L	QL (50)	--	50 (QL)	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0
Field Parameters																				
Conductivity	µS/cm	--	--	--	215.16		0.1	0.1	248.71		0.1	0.1	751.22		0.1	0.1	658.03		0.1	0.1
Depth to Water*	ft btoc	--	--	--	28.21		0.01	0.01	40.82		0.01	0.01	43.00		0.01	0.01	79.52		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--	8.41		0.01	0.01	5.73		0.01	0.01	2.22		0.01	0.01	1.79		0.01	0.01
Groundwater Elevation*	ft msl	--	--	--	302.31		0.01	0.01	346.50		0.01	0.01	347.43		0.01	0.01	266.52		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--	181.6		0.1	0.1	222.3		0.1	0.1	-65.8		0.1	0.1	-4.0		0.1	0.1
Temperature	C	--	--	--	18.89		0.01	0.01	15.54		0.01	0.01	16.78		0.01	0.01	17.39		0.01	0.01
Turbidity	NTU	--	--	--	0.45		0.1	0.1	7.82		0.1	0.1	2.59		0.1	0.1	0.22		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 msl = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals

Notes:
QL = Laboratory quantitation limit (value shown in parentheses represents highest laboratory QL for the constituent based on background data.)
GPS/GWPS = Groundwater Protection Standards
VPDES = Virginia Pollutant Discharge Elimination System
VSWMR = Virginia Solid Waste Management Regulations
* - EPA Action Level
** - Water levels gauged on August 24, 2020
Bold font = Detected constituent

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

= Concentration greater than site-specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

= Concentration greater than Virginia GPS and site-specific background

Table 2
Summary of Second Semi-Annual Modified Assessment Monitoring Program Sampling Event Data (August 2020)
Bremo Power Station, North Pond
Permit No 618

					Downgradient Wells															
				Sample ID:	MW-27D				MW-33				MW-34				MW-35			
				Sample Date:	08/25/2020				08/25/2020				08/25/2020				08/24/2020			
Parameter Name	**Units**	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix III Constituents																				
Boron	µg/L	QL (250)	--	250 (QL)	**1300**		32.4	50.0	**260**		32.4	50.0	**1200**		32.4	50.0	**530**		32.4	50.0
Calcium	µg/L	60,800	--	--	**69100**		94.0	100	**78000**		94.0	100	**35500**		94.0	100	**58000**		94.0	100
Chloride	mg/L	63.4	--	--	**13.6**		0.60	1.0	**22.6**		0.60	1.0	**12.9**		0.60	1.0	**10.0**		0.60	1.0
Fluoride	mg/L	0.15	4	4	**0.15**		0.050	0.10	**0.085**	J	0.050	0.10	**0.12**		0.050	0.10	< 0.050		0.050	0.10
pH	SU	4.49-7.25	--	--	6.14		0.01	0.01	6.47		0.01	0.01	5.93		0.01	0.01	6.66		0.01	0.01
Sulfate	mg/L	179	--	--	**264**		3.0	6.0	**45.1**		0.50	1.0	**33.3**		0.50	1.0	**35.5**		0.50	1.0
Total Dissolved Solids	mg/L	612	--	--	**860**		50.0	50.0	**373**		25.0	25.0	**255**		25.0	25.0	**300**		25.0	25.0
CCR Appendix IV Constituents																				
Antimony	µg/L	QL (5)	6	6	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0
Arsenic	µg/L	QL (10)	10	10	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0
Barium	µg/L	59.0	2,000	2,000	**33.2**		3.5	5.0	**21.3**		3.5	5.0	**41.9**		3.5	5.0	**127**		3.5	5.0
Beryllium	µg/L	QL (1)	4	4	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0
Cadmium	µg/L	1	5	5	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0
Chromium	µg/L	QL (5)	100	100	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0
Cobalt	µg/L	7.831	7.831	7.831	**0.37**		0.050	0.10	**0.18**		0.050	0.10	< 0.050		0.050	0.10	**0.65**		0.050	0.10
Fluoride	mg/L	0.15	4	4	**0.15**		0.050	0.10	**0.085**	J	0.050	0.10	**0.12**		0.050	0.10	< 0.050		0.050	0.10
Lead	µg/L	QL (5)	15	5 (QL)	**0.11**		0.077	0.10	**0.15**		0.077	0.10	< 0.077		0.077	0.10	< 0.077		0.077	0.10
Lithium	µg/L	QL (25)	40	25 (QL)	**45.1**		0.39	2.5	**4.7**		0.39	2.5	**5.9**		0.39	2.5	**13.4**		0.39	2.5
Mercury	µg/L	QL (0.2)	2	2	< 0.12		0.12	0.20	< 0.12		0.12	0.20	**0.32**		0.12	0.20	< 0.12		0.12	0.20
Molybdenum	µg/L	16.4	100	16.4	**16.8**		3.9	5.0	**6.3**		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Selenium	µg/L	QL (10)	50	50	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0
Thallium	µg/L	QL (1)	2	2	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Total Radium	pCi/L	1.39	5	5	**0.243**	U	1.20	1.20	**0.273**	U	1.44	1.44	**0.473**	U	1.45	1.45	**1.88**		1.48	1.48
Former VPDES Constituents																				
Ammonia	mg/L	--	--	--	< 0.070		0.070	0.10	< 0.070		0.070	0.10	< 0.070		0.070	0.10	< 0.070		0.070	0.10
Hardness	µg/L	--	--	--	**286000**		131	662	**257000**		131	662	**144000**		131	662	**184000**		131	662
Iron	µg/L	--	--	--	**557**	J	20.9	50.0	**247**		20.9	50.0	< 20.9		20.9	50.0	**4060**		628	1500
Manganese	µg/L	--	--	--	**244**	J	2.4	2.5	**56.2**		0.47	0.50	**5.0**		0.47	0.50	**1730**		14.2	15.0
Nitrate	mg/L	--	--	--	**0.20**		0.060	0.10	**0.68**		0.060	0.10	< 0.060		0.060	0.10	< 0.060		0.060	0.10
Speciation of Chromium																				
Hexavalent Chromium	µg/L	--	--	--	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0
VSWMR Constituents																				
Copper	µg/L	11.2	--	1,300	< 4.3		4.3	5.0	**4.5**	J	4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	**4.7**	J	3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 2.5		2.5	5.0	**4.7**	J	2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Tin	µg/L	QL (5)	--	5 (QL)	**0.69**		0.24	0.50	**0.75**		0.24	0.50	< 0.24		0.24	0.50	< 0.24		0.24	0.50
Vanadium	µg/L	22.5	--	22.5	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Zinc	µg/L	QL (50)	--	50 (QL)	< 9.5		9.5	10.0	**24.2**		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0
Field Parameters																				
Conductivity	µS/cm	--	--	--	1237.0		0.1	0.1	608.17		0.1	0.1	410.87		0.1	0.1	403.82		0.1	0.1
Depth to Water*	ft btoc	--	--	--	39.86		0.01	0.01	92.60		0.01	0.01	94.25		0.01	0.01	91.24		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--	0.45		0.01	0.01	4.82		0.01	0.01	0.75		0.01	0.01	0.29		0.01	0.01
Groundwater Elevation*	ft msl	--	--	--	289.36		0.01	0.01	243.90		0.01	0.01	243.93		0.01	0.01	244.41		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--	35.5		0.1	0.1	72.1		0.1	0.1	520.0		0.1	0.1	-64.4		0.1	0.1
Temperature	C	--	--	--	17.66		0.01	0.01	19.74		0.01	0.01	16.18		0.01	0.01	16.49		0.01	0.01
Turbidity	NTU	--	--	--	10.81		0.1	0.1	3.71		0.1	0.1	3.97		0.1	0.1	9.94		0.1	0.1

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** - Water levels gauged on August 24, 2020
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U = Not detected above the Minimum Detection Concentration

= Concentration greater than site-specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

= Concentration greater than Virginia GPS and site-specific background

Table 2
Summary of Second Semi-Annual Modified Assessment Monitoring Program Sampling Event Data (August 2020)
Bremo Power Station, North Pond
Permit No 618

					Sentinel Wells															
				Sample ID:	MW-25S				MW-25D				MW-26S				MW-26D			
				Sample Date:	08/25/2020				08/25/2020				08/25/2020				08/25/2020			
Parameter Name	**Units**	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix III Constituents																				
Boron	µg/L	QL (250)	--	250 (QL)	< 32.4		32.4	50.0	**35.0**	J	32.4	50.0	< 32.4		32.4	50.0	< 32.4		32.4	50.0
Calcium	µg/L	60,800	--	--	**45300**		94.0	100	**35900**		94.0	100	**12000**		94.0	100	**46000**		94.0	100
Chloride	mg/L	63.4	--	--	**8.9**		0.60	1.0	**7.4**		0.60	1.0	**3.2**		0.60	1.0	**8.8**		0.60	1.0
Fluoride	mg/L	0.15	4	4	**0.095**	J	0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
pH	SU	4.49-7.25	--	--	5.97		0.01	0.01	6.28		0.01	0.01	5.90		0.01	0.01	6.65		0.01	0.01
Sulfate	mg/L	179	--	--	**28.1**		0.50	1.0	**21.3**		0.50	1.0	**10.6**		0.50	1.0	**51.5**		0.50	1.0
Total Dissolved Solids	mg/L	612	--	--	**268**		25.0	25.0	**222**		25.0	25.0	**130**		25.0	25.0	**302**		25.0	25.0
CCR Appendix IV Constituents																				
Antimony	µg/L	QL (5)	6	6	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0
Arsenic	µg/L	QL (10)	10	10	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0
Barium	µg/L	59.0	2,000	2,000	**24.4**		3.5	5.0	**25.6**		3.5	5.0	**28.0**		3.5	5.0	**196**		3.5	5.0
Beryllium	µg/L	QL (1)	4	4	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0
Cadmium	µg/L	1	5	5	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0
Chromium	µg/L	QL (5)	100	100	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0
Cobalt	µg/L	7.831	7.831	7.831	**0.96**		0.050	0.10	**0.74**		0.050	0.10	**0.058**	J	0.050	0.10	**1.8**		0.050	0.10
Fluoride	mg/L	0.15	4	4	**0.095**	J	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	QL (5)	15	5 (QL)	**0.091**	J	0.077	0.10	< 0.077		0.077	0.10	< 0.077		0.077	0.10	< 0.077		0.077	0.10
Lithium	µg/L	QL (25)	40	25 (QL)	**0.74**	J	0.39	2.5	**3.1**		0.39	2.5	**0.82**	J	0.39	2.5	**4.6**		0.39	2.5
Mercury	µg/L	QL (0.2)	2	2	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20
Molybdenum	µg/L	16.4	100	16.4	< 3.9		3.9	5.0	**4.0**	J	3.9	5.0	< 3.9		3.9	5.0	**6.9**		3.9	5.0
Selenium	µg/L	QL (10)	50	50	< 4.7		4.7	10.0	< 4.7		4.7	10.0	**5.7**	J	4.7	10.0	**5.2**	J	4.7	10.0
Thallium	µg/L	QL (1)	2	2	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Total Radium	pCi/L	1.39	5	5	**0.540**	U	1.07	1.07	**2.65**		1.42	1.42	**0.627**	U	1.47	1.47	**0.588**	U	1.16	1.16
Former VPDES Constituents																				
Ammonia	mg/L	--	--	--	< 0.070		0.070	0.10	< 0.070		0.070	0.10	< 0.070		0.070	0.10	**0.080**	J	0.070	0.10
Hardness	µg/L	--	--	--	**158000**		131	662	**117000**		131	662	**38600**		131	662	**154000**		131	662
Iron	µg/L	--	--	--	**958**		20.9	50.0	**1440**		105	250	**132**		20.9	50.0	**4010**		523	1250
Manganese	µg/L	--	--	--	**264**		2.4	2.5	**224**		2.4	2.5	**25.8**		0.47	0.50	**2140**		11.8	12.5
Nitrate	mg/L	--	--	--	**0.084**	J	0.060	0.10	< 0.060		0.060	0.10	< 0.060		0.060	0.10	< 0.060		0.060	0.10
Speciation of Chromium																				
Hexavalent Chromium	µg/L	--	--	--	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0
VSWMR Constituents																				
Copper	µg/L	11.2	--	1,300	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Tin	µg/L	QL (5)	--	5 (QL)	< 0.24		0.24	0.50	< 0.24		0.24	0.50	**0.33**	J	0.24	0.50	**0.32**	J	0.24	0.50
Vanadium	µg/L	22.5	--	22.5	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Zinc	µg/L	QL (50)	--	50 (QL)	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0
Field Parameters																				
Conductivity	µS/cm	--	--	--	396.23		0.1	0.1	280.77		0.1	0.1	120.09		0.1	0.1	423.46		0.1	0.1
Depth to Water*	ft btoc	--	--	--	44.82		0.01	0.01	44.90		0.01	0.01	53.80		0.01	0.01	53.41		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--	0.55		0.01	0.01	0.45		0.01	0.01	7.18		0.01	0.01	2.19		0.01	0.01
Groundwater Elevation*	ft msl	--	--	--	316.54		0.01	0.01	316.51		0.01	0.01	341.02		0.01	0.01	340.87		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--	59.2		0.1	0.1	4.7		0.1	0.1	281.6		0.1	0.1	-30.1		0.1	0.1
Temperature	C	--	--	--	16.27		0.01	0.01	15.80		0.01	0.01	16.42		0.01	0.01	21.18		0.01	0.01
Turbidity	NTU	--	--	--	6.32		0.1	0.1	4.07		0.1	0.1	10.91		0.1	0.1	5.02		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 msl = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals

Notes:
QL = Laboratory quantitation limit (value shown in parentheses represents highest laboratory QL for the constituent based on background data.)
GPS/GWPS = Groundwater Protection Standards
VPDES = Virginia Pollutant Discharge Elimination System
VSWMR = Virginia Solid Waste Management Regulations
* - EPA Action Level
** - Water levels gauged on August 24, 2020
Bold font = Detected constituent

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

= Concentration greater than site-specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

= Concentration greater than Virginia GPS and site-specific background

Table 2
Summary of Second Semi-Annual Modified Assessment Monitoring Program Sampling Event Data (August 2020)
Bremo Power Station, North Pond
Permit No 618

					Sentinel Wells								Field QC							
				Sample ID:	MW-27S				MW-28				MW-27D DUP				Field Blank			
				Sample Date:	08/25/2020				08/26/2020				08/25/2020				08/24/2020			
Parameter Name	**Units**	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix III Constituents																				
Boron	µg/L	QL (250)	--	250 (QL)	**1600**		32.4	50.0	**510**		32.4	50.0	**1300**		32.4	50.0	< 32.4		32.4	50.0
Calcium	µg/L	60,800	--	--	**101000**		470	500	**66700**		94.0	100	**67600**		94.0	100	< 94.0		94.0	100
Chloride	mg/L	63.4	--	--	**12.4**		0.60	1.0	**10.2**		0.60	1.0	**13.6**		0.60	1.0	< 0.60		0.60	1.0
Fluoride	mg/L	0.15	4	4	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.16**		0.050	0.10	< 0.050		0.050	0.10
pH	SU	4.49-7.25	--	--	6.11		0.01	0.01	6.26		0.01	0.01	--		--	--	--		--	--
Sulfate	mg/L	179	--	--	**126**		1.5	3.0	**111**		1.0	2.0	**261**		3.0	6.0	< 0.50		0.50	1.0
Total Dissolved Solids	mg/L	612	--	--	**624**		50.0	50.0	**419**		25.0	25.0	**892**		50.0	50.0	**27.0**		25.0	25.0
CCR Appendix IV Constituents																				
Antimony	µg/L	QL (5)	6	6	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0	< 3.0		3.0	5.0
Arsenic	µg/L	QL (10)	10	10	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	**4.9**	J	4.7	10.0
Barium	µg/L	59.0	2,000	2,000	**96.2**		3.5	5.0	**55.6**		3.5	5.0	**29.3**		3.5	5.0	< 3.5		3.5	5.0
Beryllium	µg/L	QL (1)	4	4	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0	< 0.70		0.70	1.0
Cadmium	µg/L	1	5	5	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0	< 0.40		0.40	1.0
Chromium	µg/L	QL (5)	100	100	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0	< 3.7		3.7	5.0
Cobalt	µg/L	7.831	7.831	7.831	**0.28**		0.050	0.10	**0.26**		0.050	0.10	**0.19**		0.050	0.10	< 0.050		0.050	0.10
Fluoride	mg/L	0.15	4	4	< 0.050		0.050	0.10	< 0.050		0.050	0.10	**0.16**		0.050	0.10	< 0.050		0.050	0.10
Lead	µg/L	QL (5)	15	5 (QL)	< 0.077		0.077	0.10	< 0.077		0.077	0.10	< 0.077		0.077	0.10	< 0.077		0.077	0.10
Lithium	µg/L	QL (25)	40	25 (QL)	**4.1**		0.39	2.5	**44.9**		0.39	2.5	**51.1**		0.39	2.5	< 0.39		0.39	2.5
Mercury	µg/L	QL (0.2)	2	2	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20	< 0.12		0.12	0.20
Molybdenum	µg/L	16.4	100	16.4	< 3.9		3.9	5.0	< 3.9		3.9	5.0	**16.1**		3.9	5.0	< 3.9		3.9	5.0
Selenium	µg/L	QL (10)	50	50	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0	< 4.7		4.7	10.0
Thallium	µg/L	QL (1)	2	2	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10	< 0.050		0.050	0.10
Total Radium	pCi/L	1.39	5	5	**0.900**	U	1.31	1.31	**0.433**	U	1.24	1.24	**0.961**	U	1.45	1.45	**0.449**	U	0.998	0.998
Former VPDES Constituents																				
Ammonia	mg/L	--	--	--	< 0.070		0.070	0.10	< 0.070		0.070	0.10	< 0.070		0.070	0.10	< 0.070		0.070	0.10
Hardness	µg/L	--	--	--	**448000**		655	3310	**270000**		131	662	**280000**		131	662	< 131		131	662
Iron	µg/L	--	--	--	**77.9**		20.9	50.0	**329**		20.9	50.0	**339**	J	20.9	50.0	< 20.9		20.9	50.0
Manganese	µg/L	--	--	--	**52.1**		0.47	0.50	**7.9**		2.4	2.5	**179**	J	2.4	2.5	< 0.47		0.47	0.50
Nitrate	mg/L	--	--	--	**0.18**		0.060	0.10	**0.18**		0.060	0.10	< 0.060		0.060	0.10	< 0.060		0.060	0.10
Speciation of Chromium																				
Hexavalent Chromium	µg/L	--	--	--	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0	< 5.0		5.0	5.0
VSWMR Constituents																				
Copper	µg/L	11.2	--	1,300	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0	< 4.3		4.3	5.0
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	**13.3**		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Tin	µg/L	QL (5)	--	5 (QL)	< 0.24		0.24	0.50	**0.47**	J	0.24	0.50	**0.53**		0.24	0.50	< 0.24		0.24	0.50
Vanadium	µg/L	22.5	--	22.5	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
Zinc	µg/L	QL (50)	--	50 (QL)	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0	< 9.5		9.5	10.0
Field Parameters																				
Conductivity	µS/cm	--	--	--	873.03		0.1	0.1	565.49		0.1	0.1	--		--	--	--		--	--
Depth to Water*	ft btoc	--	--	--	41.23		0.01	0.01	39.51		0.01	0.01	--		--	--	--		--	--
Dissolved Oxygen	mg/L	--	--	--	0.51		0.01	0.01	0.77		0.01	0.01	--		--	--	--		--	--
Groundwater Elevation*	ft msl	--	--	--	289.65		0.01	0.01	290.36		0.01	0.01	--		--	--	--		--	--
Oxidation Reduction Potential	millivolts	--	--	--	106.5		0.1	0.1	195.1		0.1	0.1	--		--	--	--		--	--
Temperature	C	--	--	--	16.74		0.01	0.01	15.41		0.01	0.01	--		--	--	--		--	--
Turbidity	NTU	--	--	--	7.30		0.1	0.1	7.20		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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NTU = Nephelometric Turbidity Unit
ft btoc = feet below top of casing
ft msl = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals

Notes:
QL = Laboratory quantitation limit (value shown in parentheses represents highest laboratory QL for the constituent based on background data.)
GPS/GWPS = Groundwater Protection Standards
VPDES = Virginia Pollutant Discharge Elimination System
VSWMR = Virginia Solid Waste Management Regulations
* - EPA Action Level
** - Water levels gauged on August 24, 2020
Bold font = Detected constituent

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

= Concentration greater than site-specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

= Concentration greater than Virginia GPS and site-specific background

Table 3
Summary of Second Semi-Annual Modified Assessment Monitoring Program Verification Sampling Event Data (September 2020)
Bremo Power Station, North Pond
Permit No. 618

					Downgradient Well				Sentinel Well			
				Sample ID:	**MW-24**				**MW-28**			
				Sample Date:	**9/30/2020**				**9/30/2020**			
Parameter Name	**Units**	**Site-Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix IV Constituents												
Cobalt	µg/L	7.83	7.83	7.83	**57.8**		0.50	1.0	--		--	--
Lithium	mg/L	QL (25)	40	25 (QL)	--		--	--	**1.4**	J	0.39	2.5
Field Parameters												
Conductivity	µS/cm	--	--	--	900		0.1	0.1	584		0.1	0.1
Depth to Water*	ft btoc	--	--	--	80.90		0.01	0.01	39.86		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--	0.31		0.01	0.01	2.12		0.01	0.01
Groundwater Elevation	ft msl	--	--	--	265.14		0.01	0.01	290.01		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--	-36.0		0.1	0.1	170.9		0.1	0.1
pH	SU	4.49-7.25	--	--	6.12		0.01	0.01	6.10		0.01	0.01
Temperature	C	--	--	--	13.6		0.01	0.01	14.9		0.01	0.01
Turbidity	NTU	--	--	--	0.75		0.1	0.1	9.7		0.1	0.1

Notes:
MDL = Method Detection Limit
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mg/L = Milligram per liter
µg/L = Microgram 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 msl = feet above mean sea level
CCR = Coal Combustion Residuals
VPDES = Virginia Pollutant Discharge Elimination System
GPS/GWPS = Groundwater Protection Standards
* - Water levels gauged on September 30, 2020
Bold font = Detected constituent

Qualifiers:
J = Estimated Result

= Concentration greater than site-specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

= Concentration greater than Virginia GPS and site-specific background

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-11	330.52	10/27/2016	26.54	303.98
		12/07/2016	27.30	303.22
		01/18/2017	27.65	302.87
		02/28/2017	27.78	302.74
		04/10/2017	27.73	302.79
		05/11/2017	27.36	303.16
		06/19/2017	27.20	303.32
		07/25/2017	28.01	302.51
		09/06/2017	29.04	301.48
		01/29/2018	30.77	299.75
		04/30/2018	30.01	300.51
		10/15/2018	28.06	302.46
		01/16/2019	24.84	305.68
		09/09/2019	24.98	305.54
		11/18/2019	26.75	303.77
		03/04/2020	27.32	303.20
		05/07/2020	26.79	303.73
		06/02/2020	26.42	304.10
		08/24/2020	28.21	302.31
MW-29D	390.43	10/31/2016	145.32	245.11
		12/07/2016	56.35	334.08
		01/18/2017	41.60	348.83
		02/28/2017	42.38	348.05
		04/10/2017	42.60	347.83
		05/11/2017	43.54	346.89
		06/19/2017	42.93	347.50
		07/25/2017	43.56	346.87
		09/06/2017	43.79	346.64
		01/29/2018	44.85	345.58
		05/01/2018	45.90	344.53
		10/15/2018	44.32	346.11
		01/16/2019	57.07	333.36
		09/09/2019	165.00	225.43
		11/18/2019	41.65	348.78
		03/04/2020	42.27	348.16
		05/07/2020	42.46	347.97
		06/02/2020	42.42	348.01
		08/24/2020	43.00	347.43

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-29S	387.32	10/27/2016	38.81	348.51
Formerly OW-29S		12/07/2016	39.31	348.01
		01/18/2017	39.70	347.62
		02/28/2017	40.07	347.25
		04/10/2017	40.38	346.94
		05/11/2017	40.31	347.01
		06/19/2017	40.53	346.79
		07/25/2017	40.84	346.48
		09/06/2017	41.42	345.90
		01/29/2018	43.38	343.94
		05/01/2018	44.00	343.32
		10/15/2018	42.21	345.11
		01/16/2019	40.62	346.70
		09/09/2019	37.29	350.03
		11/18/2019	38.85	348.47
		03/04/2020	40.20	347.12
		05/07/2020	40.40	346.92
		06/02/2020	40.31	347.01
		08/24/2020	40.82	346.50
MW-22D	215.38	01/18/2019	11.60	203.78
		02/14/2019	11.35	204.03
	234.66	05/07/2020	28.33	206.33
		08/24/2020	29.60	205.06
MW-23D	236.43	01/18/2019	86.27	150.16
		05/07/2020	30.00	206.43
		08/24/2020	30.04	206.39
MW-24	346.04	10/28/2016	52.28	293.76
		12/07/2016	53.72	292.32
		01/18/2017	53.75	292.29
		02/28/2017	55.59	290.45
		04/10/2017	58.25	287.79
		05/11/2017	59.55	286.49
		06/20/2017	61.15	284.89
		07/25/2017	64.32	281.72
		09/06/2017	65.73	280.31
		01/29/2018	69.36	276.68
		01/30/2018	69.36	276.68
		05/01/2018	70.89	275.15
		10/15/2018	74.45	271.59
		01/16/2019	72.68	273.36
		09/09/2019	75.51	270.53
		11/18/2019	76.59	269.45
		03/04/2020	79.13	266.91
		04/08/2020	78.54	267.50
		05/07/2020	78.10	267.94
		06/02/2020	78.60	267.44
		08/24/2020	79.52	266.52

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-25D	361.41	12/07/2016	42.30	319.11
Formerly OW-25D		01/18/2017	42.12	319.29
		03/01/2017	42.88	318.53
		04/10/2017	42.22	319.19
		05/11/2017	41.91	319.50
		06/20/2017	42.16	319.25
		07/25/2017	43.33	318.08
		09/06/2017	43.02	318.39
		01/29/2018	41.57	319.84
		10/15/2018	41.30	320.11
		01/16/2019	40.86	320.55
		09/09/2019	42.22	319.19
		10/10/2019	42.84	318.57
		11/18/2019	43.03	318.38
		03/04/2020	43.76	317.65
		05/07/2020	43.96	317.45
		06/02/2020	44.32	317.09
		08/24/2020	44.90	316.51
MW-25S	361.36	12/07/2016	41.91	319.45
		01/18/2017	41.97	319.39
		03/01/2017	42.69	318.67
		04/10/2017	42.61	318.75
		05/11/2017	42.28	319.08
		06/20/2017	42.53	318.83
		07/25/2017	43.59	317.77
		09/06/2017	43.64	317.72
		01/29/2018	42.04	319.32
		10/15/2018	42.25	319.11
		01/16/2019	40.30	321.06
		09/09/2019	41.60	319.76
		11/18/2019	51.37	309.99
		03/04/2020	43.61	317.75
		05/07/2020	43.71	317.65
		06/02/2020	44.01	317.35
		08/24/2020	44.82	316.54

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-26D	394.28	10/27/2016	49.94	344.34
		12/07/2016	49.78	344.50
		01/18/2017	49.70	344.58
		02/28/2017	49.79	344.49
		04/10/2017	50.13	344.15
		05/11/2017	50.19	344.09
		06/19/2017	50.48	343.80
		07/25/2017	50.75	343.53
		09/06/2017	50.93	343.35
		01/29/2018	51.89	342.39
		10/15/2018	53.15	341.13
		01/16/2019	52.89	341.39
		09/09/2019	50.81	343.47
		11/18/2019	51.05	343.23
		03/04/2020	52.00	342.28
		05/07/2020	52.61	341.67
		06/02/2020	52.82	341.46
		08/24/2020	53.41	340.87
MW-26S	394.82	10/27/2016	50.30	344.52
		12/07/2016	50.11	344.71
		01/18/2017	50.03	344.79
		02/28/2017	50.15	344.67
		04/10/2017	50.47	344.35
		05/11/2017	50.51	344.31
		06/19/2017	50.85	343.97
		07/25/2017	50.99	343.83
		09/06/2017	51.56	343.26
		01/29/2018	52.25	342.57
		10/15/2018	53.56	341.26
		01/16/2019	53.20	341.62
		09/09/2019	51.16	343.66
		11/18/2019	51.37	343.45
		03/04/2020	50.30	344.52
		05/07/2020	52.95	341.87
		06/02/2020	53.19	341.63
		08/24/2020	53.80	341.02

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-27D	329.22	11/01/2016	145.69	183.53
		12/07/2016	186.96	142.26
		01/18/2017	161.82	167.40
		03/01/2017	148.41	180.81
		04/10/2017	141.55	187.67
		05/11/2017	129.28	199.94
		06/19/2017	79.81	249.41
		07/25/2017	38.71	290.51
		09/06/2017	32.68	296.54
		01/29/2018	35.25	293.97
		04/30/2018	36.13	293.09
		10/15/2018	35.76	293.46
		01/16/2019	33.90	295.32
		09/09/2019	36.00	293.22
		11/18/2019	37.49	291.73
		03/04/2020	38.69	290.53
		05/07/2020	39.34	289.88
		06/02/2020	39.30	289.92
		08/24/2020	39.86	289.36
MW-27S	330.88	10/27/2016	67.22	263.66
		12/07/2016	24.61	306.27
		01/18/2017	25.92	304.96
		03/01/2017	26.57	304.31
		04/10/2017	27.38	303.50
		05/11/2017	28.22	302.66
		06/19/2017	29.66	301.22
		07/25/2017	31.08	299.80
		09/06/2017	32.91	297.97
		01/29/2018	36.95	293.93
		10/15/2018	37.06	293.82
		01/16/2019	35.18	295.70
		09/09/2019	37.65	293.23
		11/18/2019	38.84	292.04
		03/04/2020	40.13	290.75
		05/07/2020	40.55	290.33
		06/02/2020	40.68	290.20
		08/24/2020	41.23	289.65

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-28	329.87	10/27/2016	29.13	300.74
		12/07/2016	29.72	300.15
		01/18/2017	30.29	299.58
		03/01/2017	30.66	299.21
		04/10/2017	31.04	298.83
		05/11/2017	31.28	298.59
		06/19/2017	31.99	297.88
		07/25/2017	33.09	296.78
		01/29/2018	37.15	292.72
		10/15/2018	36.85	293.02
		01/16/2019	34.59	295.28
		09/09/2019	37.26	292.61
		11/18/2019	38.34	291.53
		03/04/2020	38.36	291.51
		05/07/2020	37.99	291.88
		06/02/2020	38.26	291.61
		08/24/2020	39.51	290.36
MW-33	336.50	10/27/2016	105.29	231.21
		12/07/2016	80.40	256.10
		01/18/2017	80.98	255.52
		03/01/2017	81.50	255.00
		04/10/2017	82.52	253.98
		05/11/2017	83.81	252.69
		06/20/2017	85.42	251.08
		07/25/2017	87.08	249.42
		09/06/2017	88.22	248.28
		01/29/2018	92.34	244.16
		04/30/2018	92.56	243.94
		10/15/2018	90.75	245.75
		01/16/2019	90.39	246.11
		09/09/2019	89.41	247.09
		10/10/2019	89.33	247.17
		11/18/2019	89.10	247.40
		03/04/2020	90.00	246.50
		05/07/2020	90.72	245.78
		06/02/2020	91.46	245.04
		08/24/2020	92.60	243.90

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-34	338.18	10/31/2016	80.77	257.41
		12/07/2016	81.15	257.03
		01/18/2017	80.96	257.22
		02/28/2017	81.61	256.57
		04/10/2017	83.63	254.55
		05/11/2017	85.29	252.89
		06/20/2017	87.27	250.91
		07/25/2017	88.85	249.33
		09/06/2017	90.22	247.96
		01/29/2018	92.31	245.87
		04/30/2018	102.14	236.04
		10/15/2018	103.79	234.39
		01/16/2019	103.85	234.33
		09/09/2019	99.83	238.35
		11/18/2019	93.88	244.30
		03/04/2020	93.45	244.73
		05/07/2020	93.76	244.42
		06/02/2020	93.95	244.23
		08/24/2020	94.25	243.93
MW-35	335.65	10/27/2016	98.86	236.79
		12/07/2016	98.85	236.80
		01/18/2017	98.68	236.97
		02/28/2017	99.01	236.64
		04/10/2017	99.32	236.33
		05/11/2017	101.19	234.46
		06/20/2017	102.12	233.53
		07/25/2017	104.30	231.35
		09/06/2017	106.10	229.55
		01/29/2018	106.79	228.86
		04/30/2018	107.33	228.32
		10/15/2018	108.97	226.68
		01/16/2019	108.95	226.70
		09/09/2019	105.54	230.11
		11/18/2019	105.43	230.22
		03/04/2020	105.25	230.40
		05/07/2020	104.85	230.80
		06/02/2020	105.31	230.34
		08/24/2020	91.24	244.41

Table 4
Summary of Historical CCR and VSWMR Static Water Level Data
Bremo Power Station, North Pond
Permit No. 618

Well Identification	Top of Casing Elevation (ft amsl)	Measurement Date	Depth to Water (ft btoc)	Groundwater Elevation (ft amsl)
MW-36S	249.32	01/17/2019	15.14	234.18
		08/24/2020	16.81	232.51
MW-36D	249.03	01/17/2019	9.65	239.38
		08/24/2020	10.85	238.18
MW-VPDES	226.57	05/07/2020	20.59	205.98
		08/24/2020	18.49	208.08
HZ-1	240.08	08/28/2020	2.59	237.49
HZ-2	254.00	08/28/2020	2.71	251.29
HZ-3	266.99	08/28/2020	5.30	261.69
HZ-4	236.17	08/28/2020	2.74	233.43

Notes:
ft btoc - feet below top of casing
ft amsl - feet above mean sea level
CCR - Coal Combustion Residuals
VSWMR - Virginia Solid Waste Management Regulations

Table 5
Summary of North Pond NES Program Groundwater Sampling Event Data (August 2020)
Bremo Power Station, North Pond
Permit No 618

					Observation Wells																Field QC							
				Sample ID:	MW-22D				MW-23D				MW-36S				MW-36D				MW-40				MW-36D DUP				Field Blank			
				Sample Date:	8/28/2020				08/28/2020				08/27/2020				08/27/2020				05/07/2020				08/27/2020				08/27/2020			
Parameter Name	**Units**	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL
CCR Appendix III																																
Boron	µg/L	QL (250)	--	250 (QL)	310	J+	32.4	50.0	50.7	J+	32.4	50.0	< 32.4		32.4	50.0	266	J+	32.4	50.0	480		32.0	50.0	250	J+	32.4	50.0	< 32.4		32.4	50.0
Calcium	µg/L	60,800	--	--	67100		94.2	100	37000		94.2	100	40700		94.2	100	72900		94.2	100	96900		94.0	100	73200		94.2	100	< 94.2		94.2	100
Chloride	mg/L	63.4	--	--	11.3		0.60	1.0	11.0		0.60	1.0	13.0		0.60	1.0	13.6		0.60	1.0	12.7		0.60	1.0	13.6		0.60	1.0	< 0.60		0.60	1.0
pH	SU	4.49-7.25	--	--	7.21		0.01	0.01	7.13		0.01	0.01	5.67		0.01	0.01	6.27		0.01	0.01	6.80		0.01	0.01	--		--	--	--		--	--
Sulfate	mg/L	179	--	--	13.4		0.50	1.0	2.9		0.50	1.0	44.1		0.50	1.0	96.0		0.50	1.0	10.9		0.50	1.0	96.1		0.50	1.0	< 0.50		0.50	1.0
CCR Appendix IV																																
Cobalt	µg/L	7.831	7.831	7.831	0.41		0.050	0.10	0.17		0.050	0.10	0.98		0.050	0.10	0.53		0.050	0.10	0.20		0.050	0.10	0.45		0.050	0.10	< 0.050		0.050	0.10
Lithium	µg/L	QL (25)	40	25 (QL)	0.89	J	0.39	2.5	0.70	J	0.39	2.5	0.85	J	0.39	2.5	7.2		0.39	2.5	22.3		0.39	2.5	7.2		0.39	2.5	< 0.39		0.39	2.5
Molybdenum	µg/L	16.4	100	16.4	7.9		3.9	5.0	12.8		3.9	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0	< 3.9		0.39	5.0	< 3.9		3.9	5.0	< 3.9		3.9	5.0
VSWMR Constituents																																
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0	< 3.5		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 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	< 2.5		2.5	5.0
Additional Constituents																																
Alkalinity, Total	mg/L	--	--	--	302		5.0	5.0	242		5.0	5.0	182		5.0	5.0	218		5.0	5.0	--		--	--	214		5.0	5.0	< 5.0		5.0	5.0
Magnesium	µg/L	--	--	--	12100		67.8	100	8300		67.8	100	30200		67.8	100	23100		67.8	100	--		--	--	23500		67.8	100	< 67.8		67.8	100
Potassium	µg/L	--	--	--	17400		270	1500	3200		89.9	500	1070		9.0	50.0	5240		89.9	500	--		--	--	5260		89.9	500	< 9.0		9.0	50.0
Sodium	µg/L	--	--	--	43100		4910	25000	59200		4910	25000	13700		1470	7500	25500		2450	12500	--		--	--	25800		2450	12500	< 49.1		49.1	250
Field Parameters																																
Conductivity	µS/cm	--	--	--	625		0.1	0.1	486.7		0.1	0.1	504.23		0.1	0.1	620.67		0.1	0.1	700		0.1	0.1	--		--	--	--		--	--
Depth to Water	ft btoc	--	--	--	29.60		0.01	0.01	30.04		0.01	0.01	16.81		0.01	0.01	10.85		0.01	0.01	9.98		0.01	0.01	--		--	--	--		--	--
Dissolved Oxygen	mg/L	--	--	--	0.71		0.01	0.01	0.61		0.01	0.01	0.50		0.01	0.01	1.00		0.01	0.01	0.45		0.01	0.01	--		--	--	--		--	--
Groundwater Elevation	ft msl	--	--	--	205.06		0.01	0.01	206.39		0.01	0.01	232.51		0.01	0.01	238.18		0.01	0.01	206.81		0.01	0.01	--		--	--	--		--	--
Oxidation Reduction Potential	millivolts	--	--	--	-127.4		0.1	0.1	-101.2		0.1	0.1	272.5		0.1	0.1	-17.2		0.1	0.1	-138.2		0.1	0.1	--		--	--	--		--	--
Temperature	C	--	--	--	19.5		0.01	0.01	21.7		0.01	0.01	22.35		0.01	0.01	19.72		0.01	0.01	16.3		0.01	0.01	--		--	--	--		--	--
Turbidity	NTU	--	--	--	18.06		0.1	0.1	10.82		0.1	0.1	25.6		0.1	0.1	1.78		0.1	0.1	5.19		0.1	0.1	--		--	--	--		--	--

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram 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 msl = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals
QL = Laboratory quantitation limit (value shown in parentheses is a recent QL and is subject to change)
Future QL values are subject to change; however, GWPS cannot be less than values in parentheses
GWPS = Groundwater Protection Standards
Site-specific background for hexavalent chromium will be established after the requisite number of background samples
Bold font = Detected constituent
* - Groundwater Elevation data collected on August 24, 2020

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

= Concentration greater than site specific background

= Concentration greater than Federal GWPS, Virginia GPS, and site background

= Concentration greater than Virginia GPS and site background

Table 6
Summary of North Pond NES Program Surface Water and Hyporheic Zone Sampling Event Data (August 2020)
Bremo Power Station, North Ash Pond
Permit No 618

					Surface Water								Hyporheic Zones											
				Sample ID:	**SW-1**				**SW-2**				**HZ-1**				**HZ-2**				**HZ-3**				**HZ-4**			
				Sample Date:	**08/28/2020**				**08/28/2020**				**08/28/2020**				**08/28/2020**				**08/28/2020**				**08/28/2020**			
Parameter Name	Units	**Site Specific Background**	**Federal GWPS**	**Virginia GPS**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**	**Result**	**Qualifier**	**MDL**	**RL**
CCR Appendix III																												
Boron	µg/L	QL (250)	--	250 (QL)	**46.3**	J+	32.4	50.0	**804**		32.4	50.0	**414**		32.4	50.0	**262**	J+	32.4	50.0	**113**	J+	32.4	50.0	**369**		32.4	50.0
Calcium	µg/L	60,800	--	--	**28400**		94.2	100	**61900**		94.2	100	**73600**		94.2	100	**19800**		94.2	100	**10400**		94.2	100	**34600**		94.2	100
Chloride	mg/L	63.4	--	--	**9.2**		0.60	1.0	**13.1**		0.60	1.0	**8.3**		0.60	1.0	**6.9**		0.60	1.0	**1.8**		0.60	1.0	**8.6**		0.60	1.0
pH	SU	4.49-7.25	--	--	6.61		0.01	0.01	6.96		0.01	0.01	6.27		0.01	0.01	6.75		0.01	0.01	**3.89**		0.01	0.01	5.69		0.01	0.01
Sulfate	mg/L	179	--	--	**38.1**		0.50	1.0	**174**		1.0	2.0	**299**		2.0	4.0	**53.2**		0.50	1.0	**70.0**		0.50	1.0	**32.7**		0.50	1.0
CCR Appendix IV																												
Cobalt	µg/L	7.83	7.83	7.83	**2.8**		0.050	0.10	**0.48**		0.050	0.10	**99.4**		0.50	1.0	**11.3**		0.050	0.10	**27.5**		0.25	0.50	**50.3**		0.25	0.50
Lithium	µg/L	QL (25)	40	25 (QL)	< 0.39		0.39	2.5	< 0.39		0.39	2.5	**1.0**	J	0.39	2.5	**4.6**		0.39	2.5	**8.4**		0.39	2.5	**46.6**		2.0	12.5
Molybdenum	µg/L	16.4	100	16.4	< 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	**4.6**	J	3.9	5.0
VSWMR Constituents																												
Nickel	µg/L	7.9	--	7.9	< 3.5		3.5	5.0	< 3.5		3.5	5.0	**14.9**		3.5	5.0	**6.4**		3.5	5.0	**7.0**		3.5	5.0	**25.7**		3.5	5.0
Silver	µg/L	QL (5)	--	5 (QL)	< 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
Additional Constituents																												
Alkalinity, Total	mg/L	--	--	--	119		5.0	5.0	148		5.0	5.0	54.8		5.0	5.0	49.8		5.0	5.0	< 5.0		5.0	5.0	82.2		5.0	5.0
Magnesium	µg/L	--	--	--	**16600**		67.8	100	**27300**		67.8	100	**28800**		67.8	100	**11100**		67.8	100	**6200**		67.8	100	**30500**		67.8	100
Potassium	µg/L	--	--	--	**1800**		45.0	250	**2100**		45.0	250	**7290**		89.9	500	**3900**		89.9	500	**6340**		180	1000	**25600**		450	2500
Sodium	µg/L	--	--	--	**11300**		982	5000	**38400**		4910	25000	**27300**		2450	12500	**15400**		1470	7500	**6990**		982	5000	**24300**		2450	12500
Field Parameters																												
Conductivity	µS/cm	--	--	--	324.2		0.1	0.1	644		0.1	0.1	944		0.1	0.1	257.4		0.1	0.1	243.4		0.1	0.1	240.9		0.1	0.1
Depth to Water	ft btoc	--	--	--	--		--	--	--		--	--	2.59		0.01	0.01	2.71		0.01	0.01	5.30		0.01	0.01	2.74		0.01	0.01
Dissolved Oxygen	mg/L	--	--	--	6.74		0.01	0.01	8.52		0.01	0.01	3.97		0.01	0.01	5.22		0.01	0.01	5.94		0.01	0.01	5.76		0.01	0.01
Groundwater Elevation	ft msl	--	--	--	--		--	--	--		--	--	263.41		0.01	0.01	237.37		0.01	0.01	248.70		0.01	0.01	233.43		0.01	0.01
Oxidation Reduction Potential	millivolts	--	--	--	115.2		0.1	0.1	39.3		0.1	0.1	-63.1		0.1	0.1	-12.1		0.1	0.1	446.3		0.1	0.1	209.6		0.1	0.1
Temperature	C	--	--	--	22.5		0.01	0.01	22.6		0.01	0.01	22.5		0.01	0.01	22.4		0.01	0.01	23.2		0.01	0.01	21.9		0.01	0.01
Turbidity	NTU	--	--	--	19.7		0.1	0.1	103.9		0.1	0.1	47.2		0.1	0.1	1130.2		0.1	0.1	326.1		0.1	0.1	208.7		0.1	0.1

Notes:
MDL = Method Detection Limit
RL = Reporting Limit
mg/L = Milligram per liter
µg/L = Microgram 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 msl = feet above mean sea level
MDC = Minimum Detection Concentration
CCR = Coal Combustion Residuals
QL = Laboratory quantitation limit (value shown in parentheses is a recent QL and is subject to change)
Future QL values are subject to change; however, GWPS cannot be less than values in parentheses
GWPS = Groundwater Protection Standards
Site-specific background for hexavalent chromium will be established after the requisite number of background samples
Bold font = Detected constituent
* - Groundwater Elevation data collected on August 24, 2020

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

= Concentration greater than site specific background

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

= Concentration greater than Virginia GPS and site background

Table 7
2019 CCR Interstitial Pore Water Analysis
Bremo Power Station, North Pond
Permit No. 618

Sample ID:		SDW-4				SDW-7				SDW-10			
Sample Date:		01/16/2019				01/16/2019				01/16/2019			
Parameter Name	**Units**	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL	Result	Qualifier	MDL	RL
CCR Appendix III													
Boron	mg/L	**2.38**		25.0	50.0	**2.36**		25.0	50.0	**1.52**		25.0	50.0
Calcium	mg/L	**165**		412	4000	**155**		412	4000	**97.6**		412	4000
Chloride	mg/L	**18.2**		0.60	1.0	**17.3**		0.60	1.0	**12.1**		0.60	1.0
Sulfate	mg/L	**27.4**		0.50	1.0	**12.6**		0.50	1.0	**27.0**		0.50	1.0
CCR Appendix IV													
Cobalt	µg/L	**1.6**		0.050	0.10	**2.1**		0.050	0.10	**9.4**		0.050	0.10
Lithium	µg/L	**65.2**		0.42	2.5	**41.1**		0.42	2.5	**31.4**		0.42	2.5
Molybdenum	µg/L	**140**		0.10	0.50	**103**		0.10	0.50	**9.6**		0.10	0.50
VSWMR Constituents													
Nickel	µg/L	**2.1**	J	0.90	5.0	**1.8**	J	0.90	5.0	**8.4**		0.90	5.0
Silver	µg/L	< 2.5		2.5	5.0	< 2.5		2.5	5.0	< 2.5		2.5	5.0
Additional Constituents													
Alkalinity, Total	mg/L	**594**		1.0	5.0	**567**		1.0	5.0	**418**		1.0	5.0
Magnesium	µg/L	**35600**		90.6	200	**32200**		90.6	200	**35200**		90.6	200
Potassium	µg/L	**12900**		124	1000	**11600**		124	1000	**6340**		6.2	50.0
Sodium	µg/L	**17600**		285	5000	**13200**		285	5000	**26500**		285	5000
Strontium	µg/L	**8470**		2.5	5.0	**7790**		2.5	5.0	**3020**		2.5	5.0
Field Parameters													
Conductivity	uS/cm	1090		0.1	0.1	1020		0.1	0.1	937		0.1	0.1
Dissolved Oxygen	mg/L	11.57		0.01	0.01	1.15		0.01	0.01	2.07		0.01	0.01
Oxidation Reduction Potential	millivolts	-102		0.1	0.1	-107		0.1	0.1	-26.0		0.1	0.1
pH	SU	7.29		0.01	0.01	7.46		0.01	0.01	6.78		0.01	0.01
Temperature	C	14.60		0.01	0.01	14.50		0.01	0.01	15.58		0.01	0.01
Turbidity	NTU	23.1		0.1	0.1	5.0		0.1	0.1	8.9		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 = Detected Constituent

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

Table 8
Water Sample Summary
Bremo Power Station, North Pond
Permit No. 618

Well ID	Sample Date	Lithology	Screened Interval		Analysis
			feet bgs	feet msl	
Groundwater Sampling Locations - CCR Compliance and Boundary Wells					
MW-11	8/24/2020	Overburden / Saprolite	34.0 - 49.0	293.7 - 278.7	Metals, Anions, Alkalinity, and pH (field)
MW-24	8/24/2020	Deep Bedrock / Gneiss & Schist	133.0 - 153.0	210.5 - 190.5	
MW-27D	8/25/2020	Deep Bedrock / Gneiss & Schist	188.5 - 195.5	138.2 - 131.2	
MW-29S	8/25/2020	Shallow Bedrock / Schist	61.5 - 71.5	329.0 - 319.0	
MW-29D	8/25/2020	Deep Bedrock / Gneiss	146.0 - 156.0	241.3 - 231.3	
MW-33	8/25/2020	Deep Bedrock / Schist	121.5 - 131.5	212.5 - 202.5	
MW-34	8/24/2020	Shallow Bedrock / Schist	141.0 - 151.0	194.2 - 184.2	
MW-35	8/24/2020	Deep Bedrock / Schist	123.0 - 133.0	209.7 - 199.7	
MW-36S	8/27/2020	Shallow Bedrock / Gneiss	20.0 - 30.0	226.7 - 216.7	
MW-36D	8/27/2020	Deep Bedrock / Gneiss	59.0 - 69.0	187.3 - 177.3	
Groundwater Sampling Locations - Observation Wells					
MW-22D	8/28/2020	Deep Bedrock / Gneiss	80.0 - 95.0	145.9 - 130.9	Cations, Anions, Alkalinity, and pH (field)
MW-23D	8/28/2020	Deep Bedrock / Gneiss	90.0 - 100.0	143.5 133.5	
MW-25S	8/25/2020	Deep Bedrock / Schist	84.0 - 94.0	274.1 - 264.1	
MW-25D	8/25/2020	Deep Bedrock / Schist	144.0 - 154.0	214.1 - 204.1	
MW-26S	8/25/2020	Shallow Bedrock / Schist	98.0 - 108.0	294.5 - 284.5	
MW-26D	8/25/2020	Deep Bedrock / Schist	128.0 - 138.0	263.5 - 253.5	
MW-27S	8/25/2020	Shallow Bedrock / Gneiss & Schist	78.0 - 88.0	250.3 - 240.3	
MW-28	8/26/2020	Overburden / Saprolite	57.0 - 67.0	269.6 - 259.6	
MW-VPDES	8/28/2020	Unknown	Unknown		
North Ash Pond Leachate Sampling Locations					
SDW-4	1/16/2019	Ash	20.0 - 83.0	NA	Metals, Anions, Alkalinity, and pH (field)
SDW-7	1/16/2019	Ash	23.0 - 62.0	NA	
SDW-10	1/16/2019	Ash	17.0 - 56.0	NA	
Hyporheic Zone Sampling Locations					
HZ-1	8/28/2020	Shallow Overburden	3.0 - 4.0	235.5 - 234.5	Metals, Cations, Anions, Alkalinity, and pH (field)
HZ-2	8/28/2020	Shallow Overburden	2.6 - 3.6	249.8 - 248.8	
HZ-3	8/28/2020	Shallow Overburden	5.1 - 6.1	259.5 - 258.5	
HZ-4	8/28/2020	Shallow Overburden	3.0 - 4.0	231.4 - 230.4	
Surface Water Sampling Locations					
SW-1	8/28/2020	NA	NA	NA	Cations, Anions, Alkalinity, and pH (field)
SW-2	8/28/2020	NA	NA	NA	

Notes:
1) feet bgs = feet below ground surface
2) feet msl = feet mean sea level
3) Metals sampled for included boron, cobalt, lithium, molybdenum, nickel, silver, magnesium, potassium, and sodium
4) Anions sampled for included chloride and sulfate.
5) Cations sampled for include calcium, magnesium, sodium, potassium

Table 10
Historical Constituents of Concern Groundwater Analytical Results - North Pond Wells
Bremo Power Station, North Pond
Permit No. 618

				Upgradient Wells			Downgradient Wells					Sentinel Wells						Observation Wells				
Sample Date	**Unit**	**Federal GWPS**	**Virginia GPS**	**MW-11**	**MW-29S**	**MW-29D**	**MW-24**	**MW-27D**	**MW-33**	**MW-34**	**MW-35**	**MW-25S**	**MW-25D**	**MW-26S**	**MW-26D**	**MW-27S**	**MW-28**	**MW-22D**	**MW-23D**	**MW-36D**	**MW-36S**	**MW-40**
Boron																						
10/27-11/01/2016	µg/L	--	250 (QL)	12.9 J	16.2 J	25.6 J	130 J	82.7 J	467	1230	528	--	--	26.9 J	53.1 J	1570	2200	--	--	--	--	--
12/06-07/2016	µg/L	--	250 (QL)	15 B	< 5.7	64.9 J	141 J	92.4 J	319	1210	322	< 5.7	6.2 B	< 5.7	< 5.7	1320	840	--	--	--	--	--
01/18-19/2017	µg/L	--	250 (QL)	< 5.7	< 5.7	60.7 J	127 J	136 J	344	1160	265	11.2 B	35.2 J	< 5.7	< 5.7	1700	1100	--	--	--	--	--
02/28-03/02/2017	µg/L	--	250 (QL)	14.4 J	8.5 J	33.8 J	115 J	158 J	260	1110	263	27.8 J	36.3 J	5.8 J	20.7 J	1510	1090	--	--	--	--	--
04/10-12/2017	µg/L	--	250 (QL)	< 5.7	9.5 J	51.7 J+	112 J	196 J+	253	1150	273	43.1 J+	34 J+	10 J	34.6 J	1600	1090	--	--	--	--	--
05/11-12/2017	µg/L	--	250 (QL)	6 J	36.7 J+	45.8 J+	159 J+	272 J+	233 J	1160	287	47.3 J+	27.4 J+	13.5 J	38.9 J	1680	1110	--	--	--	--	--
06/19-20/2017	µg/L	--	250 (QL)	< 25	< 25	37.2 J	162	499	231	1180	298	32 J	< 25	< 25	< 25	1740	1110	--	--	--	--	--
07/24-25/2017	µg/L	--	250 (QL)	< 25	< 25	29.4 J	173	519	215	1170	296	< 25	< 25	< 25	< 25	1670	1090	--	--	--	--	--
09/06/2017	µg/L	--	250 (QL)	< 25	< 25	34.6 J	154	508	216	1150	244	--	--	--	--	--	--	--	--	--	--	--
04/30-05/01/2018	µg/L	--	250 (QL)	< 25	< 25	54	170	960	220	1200	280	--	--	--	--	--	--	--	--	--	--	--
10/15-16/2018	µg/L	--	250 (QL)	< 25	< 25	45 J	160	1300	220	1200	410	--	--	--	--	--	--	--	--	--	--	--
01/07-18/2019	µg/L	--	250 (QL)	< 25.0	< 25.0	40.2 J	167	1250	196	1090	412	--	--	--	--	--	--	145	79.6	198	< 25.0	--
01/16-18/2019	µg/L	--	250 (QL)	--	--	--	170	1200	200	1100	410	--	--	--	--	--	--	--	--	--	--	--
09/09-13/2019	µg/L	--	250 (QL)	< 6.6	< 6.6	44 J	170	1300	390 J+	1200	440	32 J	38 J	7.7 J	9.4 J	1600	1000	--	--	--	--	--
03/02-05/2020	µg/L	--	250 (QL)	< 6.6	< 6.6	44 J	200	1300	230	1200	490	27 J	35 J	< 6.6	7.7 J	1600	580	--	--	--	--	--
05/07/2020	µg/L	--	250 (QL)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	290	--	--	--	480
08/24-28/2020	µg/L	--	250 (QL)	< 32.4	< 32.4	47 J	210	1300	260	1200	530	< 32.4	35 J	< 32.4	< 32.4	1600	510	310	50.7	266	< 32.4	--
Cobalt																						
10/27-11/01/2016	µg/L	7.83	7.83	0.89 J	6.5	1.4	1.8	0.76 J	0.3 J	0.26 J	0.1 J	--	--	2.1	4.3	2.0	4.2	--	--	--	--	--
12/06-07/2016	µg/L	7.83	7.83	2.6	4.3	1.5	1.2	0.12 J	< 0.10	< 0.10	0.14 J	7.0	2.9	1.3	0.90 J	0.99 J	1.0	--	--	--	--	--
01/18-19/2017	µg/L	7.83	7.83	1.3	5.4	1.6	0.6 J	0.1 J	< 0.10	< 0.10	< 0.10	5.4	2.1	0.76 J	1.1	0.62 J	0.43 J	--	--	--	--	--
02/28-03/02/2017	µg/L	7.83	7.83	0.88 J	4.3	1.1	0.55 J	0.15 J	< 0.10	0.15 J	< 0.10	2.2	1.4	0.24 J	1.1	0.50 J	0.46 J	--	--	--	--	--
04/10-12/2017	µg/L	7.83	7.83	0.42 J	3.4	0.24 J	0.69 J	0.1 J	< 0.10	< 0.10	0.1 J	1.9	0.75 J	0.40 J	1.2	0.50 J	0.44 J	--	--	--	--	--
05/11-12/2017	µg/L	7.83	7.83	0.66 J	3.1	0.99 J	0.67 J	0.14 J	0.13 J	< 0.10	0.22 J	1.6	1.1	0.38 J	1.5	0.30 J	0.45 J	--	--	--	--	--
06/19-20/2017	µg/L	7.83	7.83	0.38 J	2.7	0.86 J	0.71 J	0.13 J	0.15 J	< 0.10	0.48 J	0.12	0.25 J	0.26 J	1.7	0.36 J	0.27 J	--	--	--	--	--
07/24-25/2017	µg/L	7.83	7.83	0.22 J	2	0.79 J	1	< 0.10	< 0.10	< 0.10	0.24 J	0.95 J	0.29 J	< 0.10	1.2	0.27 J	0.26 J	--	--	--	--	--
01/29-30/2018	µg/L	7.83	7.83	0.62	1.2	0.55	1.3	0.4 J	< 0.15	< 0.15	0.25 J	0.92	--	< 0.15	--	0.27 J	0.62	--	--	--	--	--
04/30-05/01/2018	µg/L	7.83	7.83	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	--	--	--	--	--	--	--	--	--	--	--
10/15-16/2018	µg/L	7.83	7.83	0.42 J	0.82	0.76	1.1	0.13 J	0.25 J	< 0.085	0.22 J	--	--	--	--	--	--	--	--	--	--	--
01/07-18/2019	µg/L	7.83	7.83	0.74	0.89	0.35	1.6	0.37	0.065 J	< 0.050	0.27	--	--	--	--	--	--	0.37	14.8	0.29	1.5	--
01/16-18/2019	µg/L	7.83	7.83	--	--	--	1.6	0.37	0.065 J	< 0.050	0.27	--	--	--	--	--	--	--	--	0.29	1.5	--
09/09-13/2019	µg/L	7.83	7.83	0.34	0.28	0.34	1.1	0.52	29.1	0.11	0.32	0.64	0.68	0.055 J	2.0	0.28 J	0.65	--	--	--	--	--
10/10/2019	µg/L	7.83	7.83	--	--	--	--	--	0.61	--	--	--	--	--	--	--	--	--	--	--	--	--
03/02-05/2020	µg/L	7.83	7.83	1.2	0.78	0.37	12.1	1.4	0.13	< 0.050	0.42	1.3	0.82	< 0.050	1.7	0.20	0.11	--	--	--	--	--
04/08/2020	µg/L	7.83	7.83	--	--	--	16.1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/07/2020	µg/L	7.83	7.83	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.29	--	--	--	0.20
08/24-28/2020	µg/L	7.83	7.83	0.60	0.28	0.26	61.9	0.37	0.18	< 0.050	0.65	0.96	0.74	0.058 J	1.8	0.28	0.26	0.41	0.17	0.53	0.98	--
Lithium																						
10/27-11/01/2016	µg/L	40	25 (QL)	1 J	2.3 J	2.8 J	2.6 J	8.6 J	7.1 J	7.9 J	57.1	--	--	5.1 J	19.4 J	7.0 J	5.7 J	--	--	--	--	--
12/06-07/2016	µg/L	40	25 (QL)	3.5 B	< 0.70	7.6 B	4.8 B	88	4.8 B	9.9 J	21.8 J	< 0.70	1.6 B	2.0 B	4.0 B	5.1 B	0.98 B	--	--	--	--	--
01/18-19/2017	µg/L	40	25 (QL)	< 0.70	< 0.70	5.2 J	3.7 J	94	3 J	6.7 J	18.7 J	< 0.70	2.5 J	0.80 J	4.5 J	7.3 J	0.97 J	--	--	--	--	--
02/28-03/02/2017	µg/L	40	25 (QL)	< 0.70	0.86 B	2.9 J	2.5 J	85.9	3.4 J	7.7 J	22.1 J	1.5 J	3.6 J	1.9 J	5.8 J	6.4 J	1.9 J	--	--	--	--	--
04/10-12/2017	µg/L	40	25 (QL)	< 0.70	< 0.70	< 0.70	< 0.70	76.2	< 0.70	8.1 J+	18.9 J	< 0.70	6.6 J	< 0.70	3.5 J	< 0.70	< 0.70	--	--	--	--	--
05/11-12/2017	µg/L	40	25 (QL)	3.9 J+	2.3 J	4.2 J	3 J+	95.7 J+	3.8 J	8.1 J+	24.9 J	1.9 J+	5.5 J	2.4 J	7.3 J	8.6 J+	3.8 J	--	--	--	--	--
06/19-20/2017	µg/L	40	25 (QL)	< 0.70	1.2 J	3.7 J	1.1 J	83.3	2.1 J	6.4 J	23.9 J	< 0.070	3.8 J	1.8 J	5.7 J	5.3 J	1.8 J	--	--	--	--	--
07/24-25/2017	µg/L	40	25 (QL)	0.79 J	1.3 J	3 J	< 0.70	66.2	1.9 J	6.9 J	20.2 J	< 0.70	3.2 J	< 0.70	4.4 J	3.9 J	2.2 J	--	--	--	--	--
01/29-30/2018	µg/L	40	25 (QL)	0.43 J	0.75	2.7	1.9	68	4.3	7.7	35.7	0.76	--	1.1	--	5.7	1.7	--	--	--	--	--
04/30-05/01/2018	µg/L	40	25 (QL)	0.48 J	0.80	2.0	1.9	57.6	3.5	6.7	33.1	--	--	--	--	--	--	--	--	--	--	--
10/15-16/2018	µg/L	40	25 (QL)	0.43 J	0.77 J	2.1 J	1.6 J	51.0	1.6 J	7.1	54.8	--	--	--	--	--	--	--	--	--	--	--
01/16-18/2019	µg/L	40	25 (QL)	< 0.42	0.62 J	2.0 J	2.0 J	46.1	0.80 J	6.6	31.2	--	--	--	--	--	--	2.7	15.6	6.8	0.87 J	--
09/09-13/2019	µg/L	40	25 (QL)	< 0.42	0.50 J	2.2 J	1.5 J	50.3	1.8 J	7.1	27.2	0.56 J	3.7	0.99 J	4.7	5.4 J	1.3 J	--	--	--	--	--
03/02-05/2020	µg/L	40	25 (QL)	< 0.42	< 0.42	1.4 J	2.1 J	46.4	5.5	7.5	22.2	< 0.42	3.0	< 0.42	3.9	3.5	0.88 J	--	--	--	--	--
05/07/2020	µg/L	40	25 (QL)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.7	--	--	--	22.3
08/24-28/2020	µg/L	40	25 (QL)	< 0.39	0.56 J	1.6 J	2.8	45.1	4.7	5.9	13.4	0.74 J	3.1	0.82 J	4.6	4.1	44.9	0.89 J	0.70 J	7.2	0.85 J	--
09/30/2020	µg/L	40	25 (QL)	--	--	--	--	--	--	--	--	--	--	--	--	--	1.4 J	--	--	--	--	--

Table 10
Historical Constituents of Concern Groundwater Analytical Results - North Pond Wells
Bremo Power Station, North Pond
Permit No. 618

				Upgradient Wells			Downgradient Wells					Sentinel Wells						Observation Wells				
Sample Date	**Unit**	**Federal GWPS**	**Virginia GPS**	**MW-11**	**MW-29S**	**MW-29D**	**MW-24**	**MW-27D**	**MW-33**	**MW-34**	**MW-35**	**MW-25S**	**MW-25D**	**MW-26S**	**MW-26D**	**MW-27S**	**MW-28**	**MW-22D**	**MW-23D**	**MW-36D**	**MW-36S**	**MW-40**
Molybdenum																						
10/27-11/01/2016	µg/L	100	16.4	< 1.10	7.6	46.1	14.1	161	22	1.9 J	47.2	--	--	1.3 J	43.1	1.6 J	< 1.10	--	--	--	--	--
12/06-07/2016	µg/L	100	16.4	< 1.10	2 J	15.7	22.8	84	13.1	4.2 J	10	3.9 J	18.9	< 1.10	15.2	1.2 J	< 1.10	--	--	--	--	--
01/18-19/2017	µg/L	100	16.4	< 1.10	1.7 J	16.4	40.9	72.9	14.9	2.1 J	6.8	5.7	8.3	< 1.10	16.7	1.3 J	< 1.10	--	--	--	--	--
02/28-03/02/2017	µg/L	100	16.4	< 1.10	1.3 J	12.8	34.1	50.6	10.5	1.9 J	4.8 J	4.9 J	8.8	< 1.10	12.0	1.2 J	< 1.10	--	--	--	--	--
04/10-12/2017	µg/L	100	16.4	< 1.10	1.4 J	3.5 J	22	39.2	9.8	1.2 J	4.6 J	5.1	7.8	< 1.10	9.8	1.4 J	< 1.10	--	--	--	--	--
05/11-12/2017	µg/L	100	16.4	< 1.10	< 1.10	5.5	29.9	38.4	7.9	< 1.10	4.2 J	5.0 J	12.7	< 1.10	9.5	1.2 J	< 1.10	--	--	--	--	--
06/19-20/2017	µg/L	100	16.4	< 1.10	< 1.10	3.8 J	23.1	29.7	8.5	< 1.10	4 J	0.34 J	4.2 J	< 1.10	8.9	1.1 J	< 1.10	--	--	--	--	--
07/24-25/2017	µg/L	100	16.4	< 1.10	< 1.10	3.3 J	26.4	25.7	7.1	< 1.10	3.7 J	5.0 J	5.4	< 1.10	7.8	< 1.10	< 1.10	--	--	--	--	--
01/29-30/2018	µg/L	100	16.4	< 2.50	< 2.50	< 2.50	27.9	28.7	5.2	< 2.50	2.7 J	3.7 J	--	< 2.50	--	< 2.50	< 2.50	--	--	--	--	--
04/30-05/01/2018	µg/L	100	16.4	< 2.50	< 2.50	< 2.50	24.0	16.1	4.0 J	< 2.50	3.4 J	--	--	--	--	--	--	--	--	--	--	--
10/15-16/2018	µg/L	100	16.4	< 2.5	< 2.5	< 2.5	25.6	8.2	4.6 J	< 2.5	< 2.5	--	--	--	--	--	--	--	--	--	--	--
01/07-18/2019	µg/L	100	16.4	< 0.10	0.27 J	0.96	22.6	10.3	3.8	0.50	2.2	--	--	--	--	--	--	12.8	27.5	2.9	0.73	--
01/16-18/2019	µg/L	100	16.4	--	--	--	22.9	11.2	4.0 J	< 2.5	< 2.5	--	--	--	--	--	--	--	--	2.6 J	< 2.5	--
09/09-13/2019	µg/L	100	16.4	< 0.90	< 0.90	7.7	22.6	20.4	< 0.90	< 0.90	1.6 J	1.7 J	3.6 J	< 0.90	5.8	2.4 J	< 0.90	--	--	--	--	--
03/02-05/2020	µg/L	100	16.4	< 0.90	< 0.90	9.3	3.6 J	19.8	6.2	1.0 J	1.7 J	2.4 J	5.8	< 0.90	7.0	2.0 J	0.90 J	--	--	--	--	--
04/08/2020	µg/L	100	16.4	--	--	--	3.7 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
05/07/2020	µg/L	100	16.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--	< 3.9
08/24-28/2020	µg/L	100	16.4	< 3.9	< 3.9	7.8	9.3	16.8	6.3	< 3.9	< 3.9	< 3.9	4.0 J	< 3.9	6.9	< 3.9	< 3.9	7.9	12.8	< 3.9	< 3.9	--
Nickel																						
10/27-11/01/2016	µg/L	--	7.9	< 4.50	< 4.50	7.9	< 4.50	9.6	< 4.50	< 4.50	< 4.50	--	--	< 4.50	< 4.50	< 4.50	20.0	--	--	--	--	--
12/06-07/2016	µg/L	--	7.9	< 4.50	< 4.50	6.4	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	6.2	< 4.50	< 4.50	< 4.50	8.3	--	--	--	--	--
01/18-19/2017	µg/L	--	7.9	< 4.50	4.5 J	6.5	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	15.0	--	--	--	--	--
02/28-03/02/2017	µg/L	--	7.9	< 4.50	< 4.50	4.7 J	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	13.6	--	--	--	--	--
04/10-12/2017	µg/L	--	7.9	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	13.2	--	--	--	--	--
05/11-12/2017	µg/L	--	7.9	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	10.8	--	--	--	--	--
06/19-20/2017	µg/L	--	7.9	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 0.45	< 4.50	< 4.50	< 4.50	< 4.50	12.5	--	--	--	--	--
07/24-25/2017	µg/L	--	7.9	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	< 4.50	9.5	--	--	--	--	--
09/09-13/2019	µg/L	--	7.9	< 0.90	1.5 J	< 0.90	< 0.90	3.5 J	6.5	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	< 0.90	13.6	--	--	--	--	--
03/02-05/2020	µg/L	--	7.9	< 0.90	1.6 J	3.6 J	1.8 J	4.3 J	9.9 J+	< 0.90	1.2 J	< 0.90	1.8 J	< 0.90	< 0.90	1.5 J	13.0	--	--	--	--	--
05/07/2020	µg/L	--	7.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--	< 3.5
08/24-28/2020	µg/L	--	7.9	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	4.7 J	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	< 3.5	13.3	< 3.5	< 3.5	< 3.5	< 3.5	--
Silver																						
10/27-11/01/2016	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	7.8	< 0.80	< 0.80	< 0.80	--	--	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
12/06-07/2016	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	2 J	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
01/18-19/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
02/28-03/02/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	1.8 J	< 0.80	0.96 J	0.97 J	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
04/10-12/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	1.5 J	< 0.80	2.2 J	< 0.80	< 0.80	0.89 J	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
05/11-12/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	1.5 J	1.6 J	3 J	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
06/19-20/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.080	< 0.80	< 0.80	< 0.80	5.1	< 0.80	--	--	--	--	--
07/24-25/2017	µg/L	--	5 (QL)	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	< 0.80	--	--	--	--	--
09/09-13/2019	µg/L	--	5 (QL)	< 2.5	< 2.5	< 2.5	< 2.5	3.7 J	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	--	--	--	--	--
03/02-05/2020	µg/L	--	5 (QL)	< 2.5	< 2.5	< 2.5	< 2.5	5.7	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	--	--	--	--	--
05/07/2020	µg/L	--	5 (QL)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.5	--	--	--	< 2.5
08/24-28/2020	µg/L	--	5 (QL)	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	4.7 J	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	--

Notes:
µg/L = Microgram per liter
CCR = Coal Combustion Residuals
GWPS = Federal Groundwater Protection Standards
GPS = Virginia Groundwater Protection Standards

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

= Concentration greater than Federal GWPS, Virginia GPS, and site-specific background

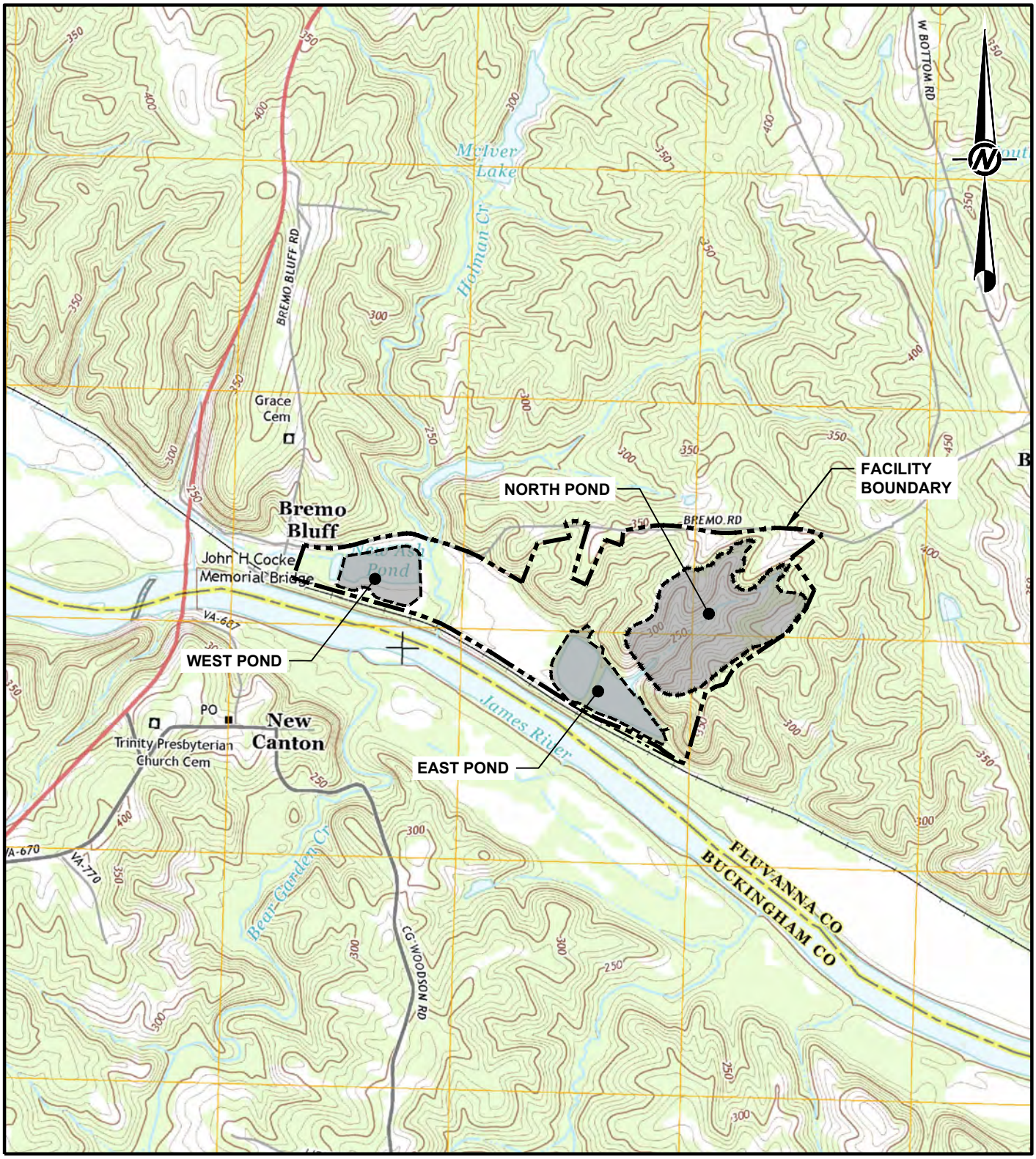
= Concentration greater than Virginia GPS and site-specific background

Table 11
Geochemistry Parameters
Bremo Power Station, North Pond
Permit No. 618

		Upgradient Wells			North Pond Downgradient Wells					Observation Wells				North Pond Source Area Wells	
Sample ID:		**MW-11**	**MW-29D**	**MW-29S**	**MW-24**	**MW-27D**	**MW-33**	**MW-34**	**MW-35**	**MW-22D**	**MW-23D**	**MW-36S**	**MW-36D**	**SDW-4**	**SDW-7**
Sample Date:		01/07/19	01/07/19	01/07/19	08/25/20	08/25/20	08/25/20	08/25/20	08/24/20	08/28/20	08/28/20	08/26/20	08/26/20	01/16/19	01/16/19
Parameter Name	Unit	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result	Result
Alkalinity, Total	mg/L	91.0	256	32.1	241	360	245	144	214	302	242	182	218	594	567
Boron	µg/L	< 25	40.2 J	< 25.0	210	1300	260	1200	530	310	50.7	< 32.4	226	2380	2360
Calcium	µg/L	19100	50100	13500	70300	69100	78000	35500	58000	67100	37000	40700	72900	165000	155000
Chloride	mg/L	9.7	58.8	29.8	33.0	13.6	22.6	12.9	10.0	11.3	11.01	13.0	13.6	18.2	17.3
Magnesium	µg/L	13200	12500	2600	10800	26500	14200	13200	10200	12100	8300	30200	23100	35600	32200
Potassium	µg/L	333	5370	948	10500	4060	9440	1840	10100	17400	3200	1070	5240	12900	11600
Sodium	µg/L	4120	123000	23700	37000	186000	28000	23800	23000	43100	59200	13700	25500	17600	13200
Sulfate	mg/L	7.0	105	24.4	42.1	264	45.1	33.3	35.5	13.4	2.9	44.1	96.0	27.4	12.6

Notes:
µg/L = Microgram per liter
mg/L = Milligram per liter

Figures



REFERENCE

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

2000 0 2000
SCALE FEET

CLIENT
DOMINION ENERGY

PROJECT
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

CONSULTANT
GOLDER

YYYY-MM-DD	2020-07-15
DESIGNED	HDE
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

TITLE
SITE LOCATION MAP

PROJECT NO. 20-139823
REV. 0
FIGURE 1

Path: G:\Plan Production Data Files\Drawing Data Files\20-140438\010_Bremo-ACM\Active Drawings\20140438-010-01.dwg

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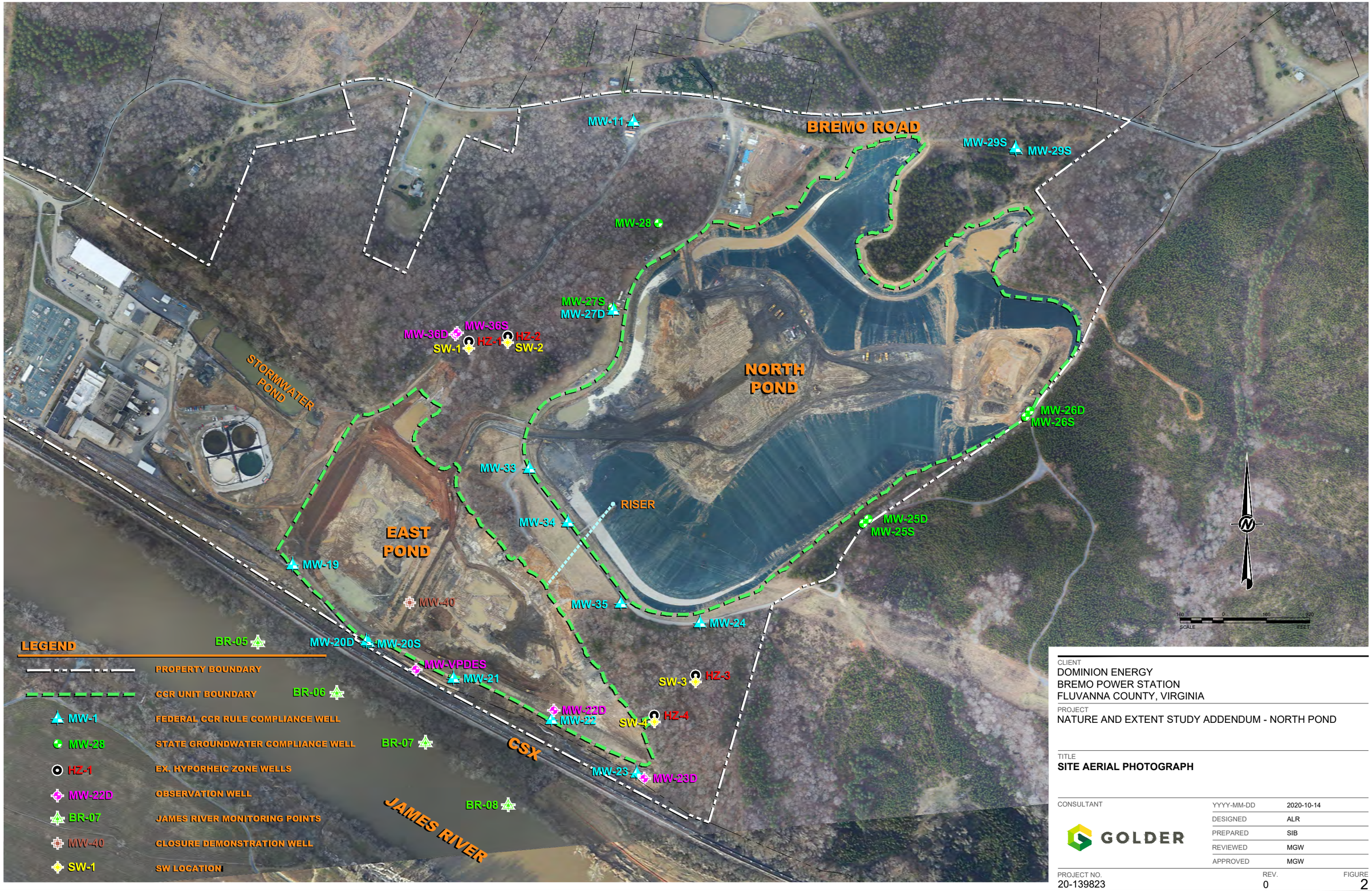

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM - NORTH POND

TITLE
SITE AERIAL PHOTOGRAPH

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-14
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 0 | FIGURE 2

Path: G:\Plan Production Data Files\Drawing Data Files\20-139823\E - NES-NAP\Active Drawings\20139823E02.dwg

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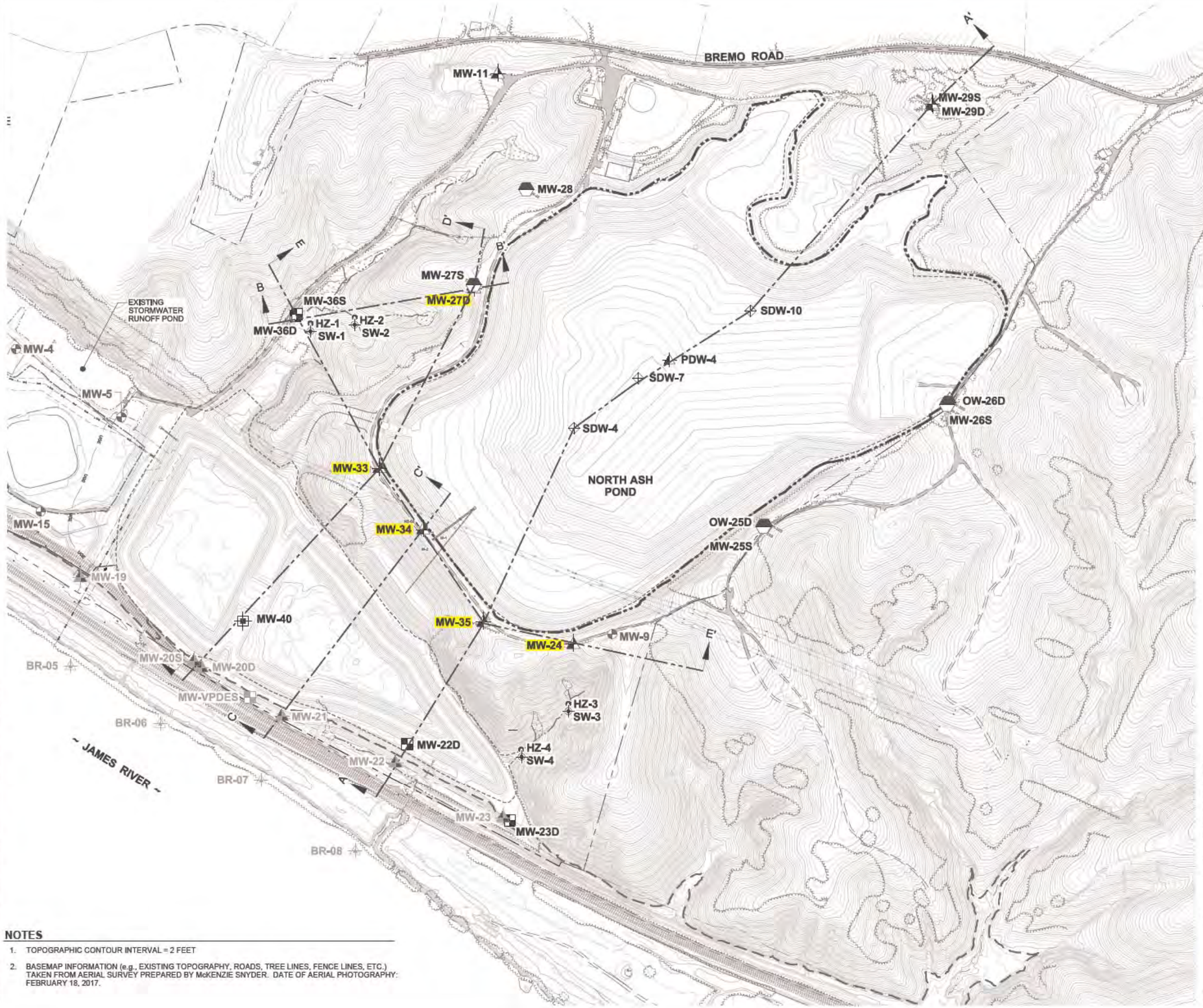

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- OW-25D — EX. GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- SW-4 — SW LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- MW-35 — MONITORING WELL WITH VIRGINIA GPS OR FEDERAL GWPS EXCEEDENCE
- BR-05 — JAMES RIVER MONITORING POINTS
- MW-40 — CLOSURE DEMONSTRATION WELL

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. 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
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
SITE PLAN

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 3

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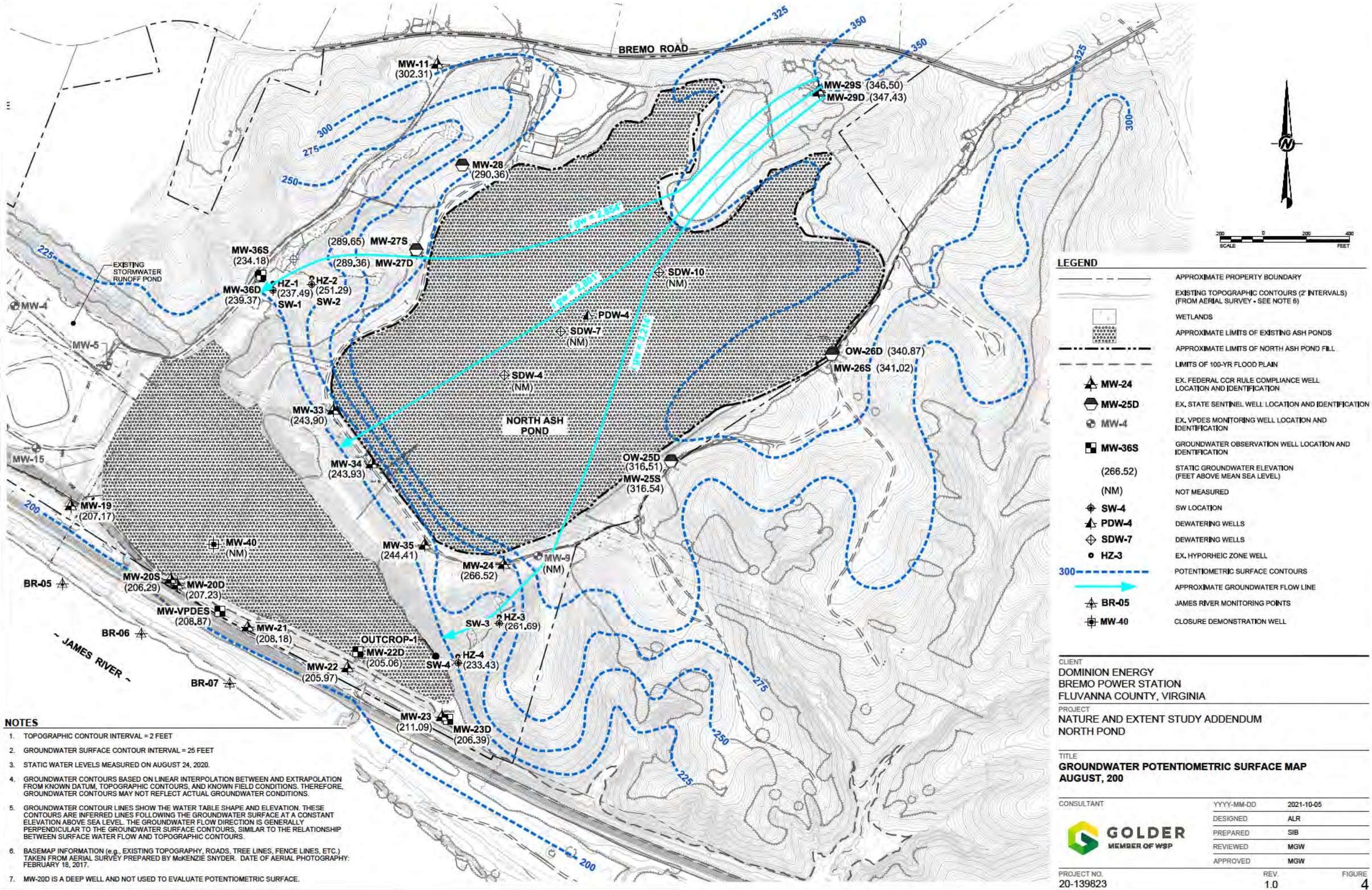
© THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-25D — EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- (266.52) — STATIC GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
- (NM) — NOT MEASURED
- SW-4 — SW LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- 300 — POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- BR-05 — JAMES RIVER MONITORING POINTS
- MW-40 — CLOSURE DEMONSTRATION WELL

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

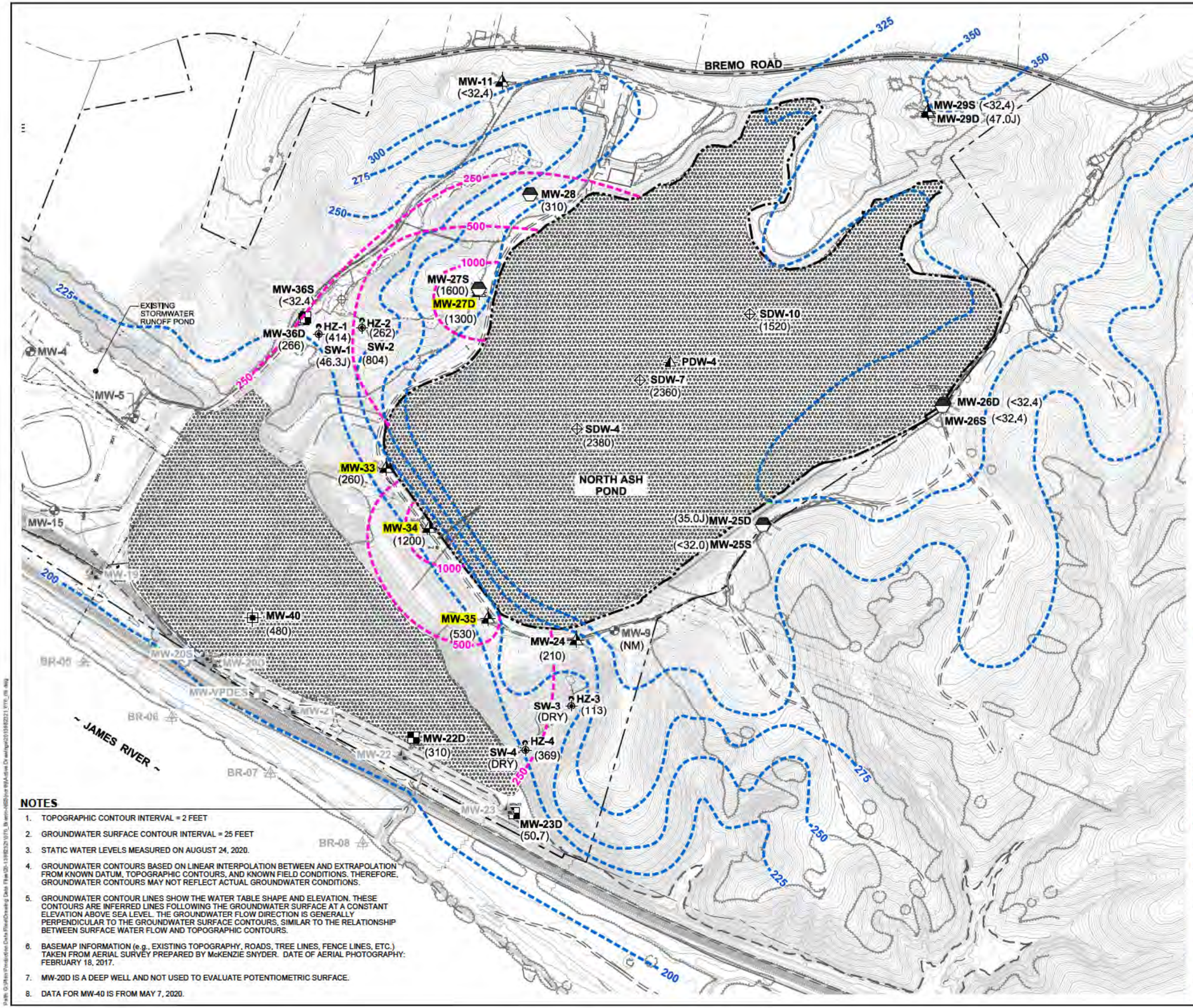
TITLE
GROUNDWATER POTENTIOMETRIC SURFACE MAP
AUGUST, 200

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 4

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



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FOR MW-40 IS FROM MAY 7, 2020.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-25D — EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- (4.7J) — BORON CONCENTRATION IN ug/L
- (NM) — NOT MEASURED
- SW-4 — SURFACE WATER LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- 300 — POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- MW-24 — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- BR-05 — JAMES RIVER MONITORING POINTS
- 250 — BORON ISOCONCENTRATION CONTOURS
- MW-40 — CLOSURE DEMONSTRATION WELL

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

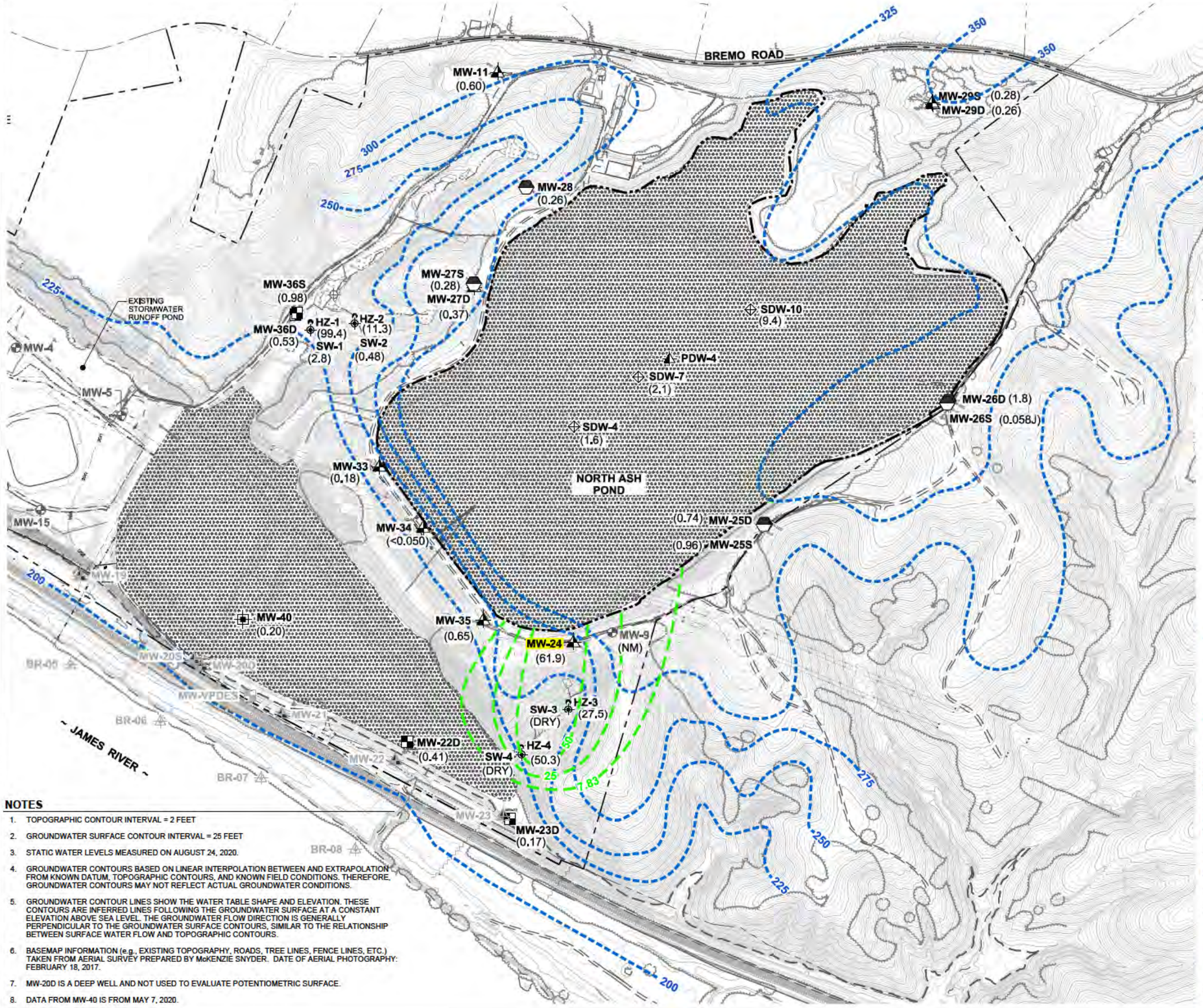
TITLE
NORTH POND BORON ISOCONCENTRATION CONTOURS AUGUST 2020

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 5

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



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FROM MW-40 IS FROM MAY 7, 2020.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-25D — EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- (4.7J) — COBALT CONCENTRATION IN ug/L
- (NM) — NOT MEASURED
- SW-4 — SURFACE WATER LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- 300 — POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- MW-24 — MONITORING WELL WITH COBALT GROUNDWATER PROTECTION STANDARD EXCEEDED
- BR-05 — JAMES RIVER MONITORING POINTS
- 7.83 — COBALT ISOCONCENTRATION CONTOURS
- MW-40 — CLOSURE DEMONSTRATION WELL

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DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

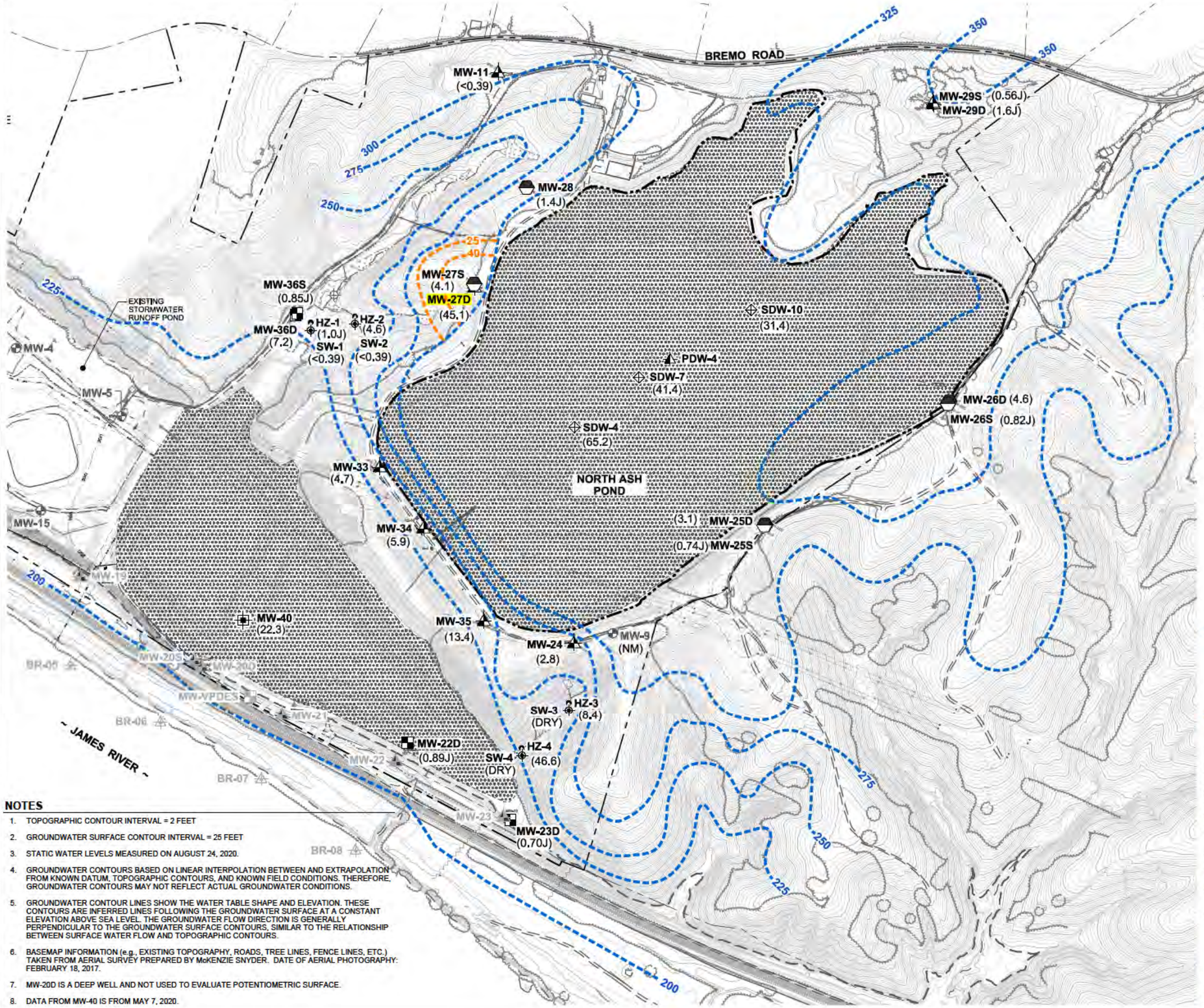
TITLE
NORTH POND COBALT ISOCONCENTRATION CONTOURS
AUGUST - SEPTEMBER 2020

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 6

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



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FROM MW-40 IS FROM MAY 7, 2020.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-25D — EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- (41.4) — LITHIUM CONCENTRATION IN ug/L
- (NM) — NOT MEASURED
- SW-4 — SURFACE WATER LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- 300 — POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- MW-27D — MONITORING WELL WITH LITHIUM GROUNDWATER PROTECTION STANDARD EXCEEDED
- BR-05 — JAMES RIVER MONITORING POINTS
- 25 — LITHIUM ISOCONCENTRATION CONTOURS
- MW-40 — CLOSURE DEMONSTRATION WELL

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

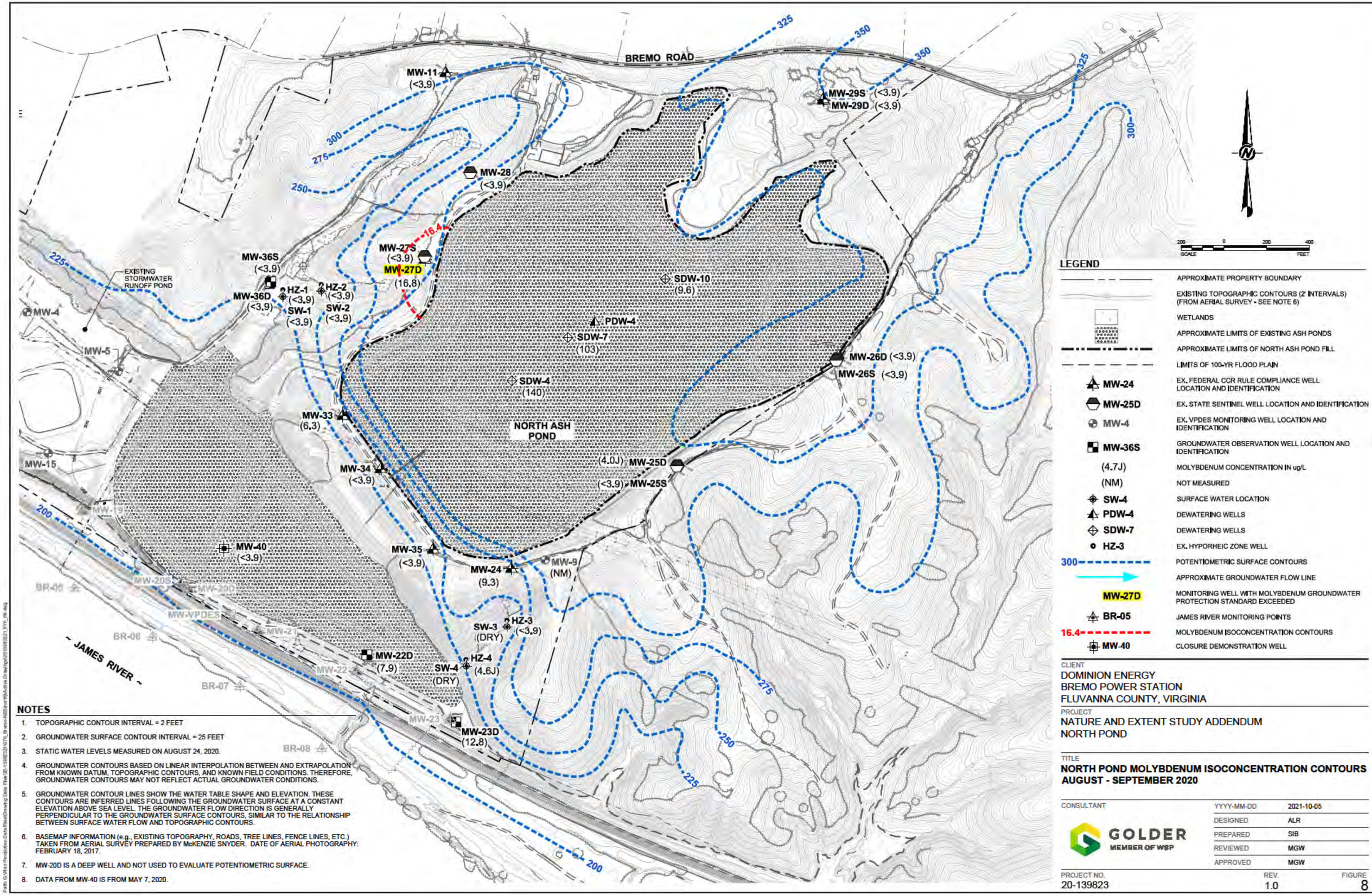
TITLE
NORTH POND LITHIUM ISOCONCENTRATION CONTOURS
AUGUST - SEPTEMBER 2020

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 7

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



LEGEND

	APPROXIMATE PROPERTY BOUNDARY
	EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
	WETLANDS
	APPROXIMATE LIMITS OF EXISTING ASH PONDS
	APPROXIMATE LIMITS OF NORTH ASH POND FILL
	LIMITS OF 100-YR FLOOD PLAIN
MW-24	EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
MW-25D	EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
MW-4	EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
MW-36S	GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
(4.7J)	MOLYBDENUM CONCENTRATION IN ug/L
(NM)	NOT MEASURED
SW-4	SURFACE WATER LOCATION
PDW-4	DEWATERING WELLS
SDW-7	DEWATERING WELLS
HZ-3	EX. HYPORHEIC ZONE WELL
300	POTENTIOMETRIC SURFACE CONTOURS
	APPROXIMATE GROUNDWATER FLOW LINE
MW-27D	MONITORING WELL WITH MOLYBDENUM GROUNDWATER PROTECTION STANDARD EXCEEDED
BR-05	JAMES RIVER MONITORING POINTS
16.4	MOLYBDENUM ISOCONCENTRATION CONTOURS
MW-40	CLOSURE DEMONSTRATION WELL

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FROM MW-40 IS FROM MAY 7, 2020.

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

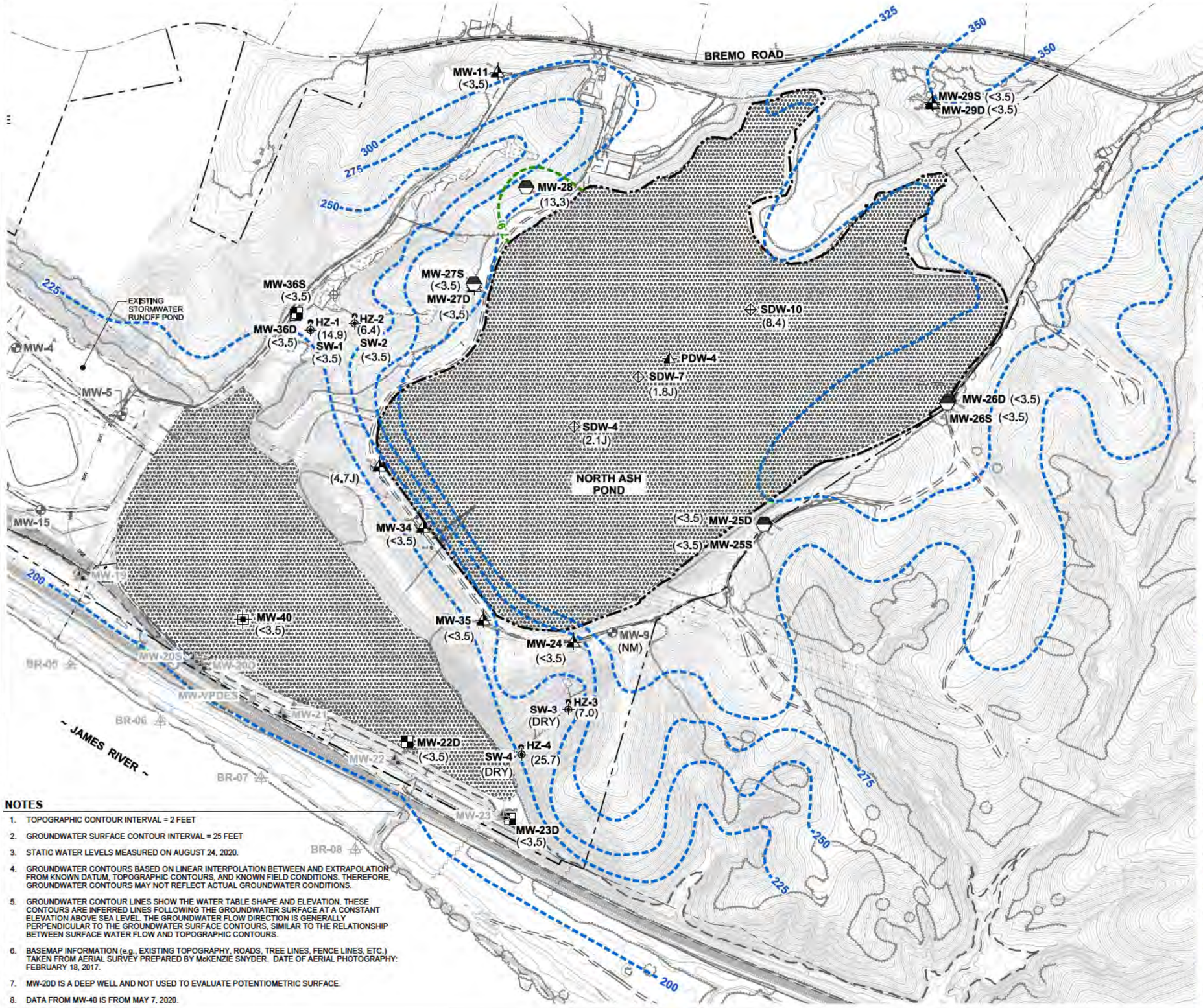
TITLE
NORTH POND MOLYBDENUM ISOCONCENTRATION CONTOURS AUGUST - SEPTEMBER 2020

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 8

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



NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FROM MW-40 IS FROM MAY 7, 2020.

LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
- WETLANDS
- APPROXIMATE LIMITS OF EXISTING ASH PONDS
- APPROXIMATE LIMITS OF NORTH ASH POND FILL
- LIMITS OF 100-YR FLOOD PLAIN
- MW-24 — EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
- MW-25D — EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
- MW-4 — EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
- MW-36S — GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
- (4.7J) — NICKEL CONCENTRATION IN ug/L
- (NM) — NOT MEASURED
- SW-4 — SURFACE WATER LOCATION
- PDW-4 — DEWATERING WELLS
- SDW-7 — DEWATERING WELLS
- HZ-3 — EX. HYPORHEIC ZONE WELL
- 300 — POTENTIOMETRIC SURFACE CONTOURS
- APPROXIMATE GROUNDWATER FLOW LINE
- BR-05 — JAMES RIVER MONITORING POINTS
- 7.9 — NICKEL ISOCONCENTRATION CONTOURS
- MW-40 — CLOSURE DEMONSTRATION WELL

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

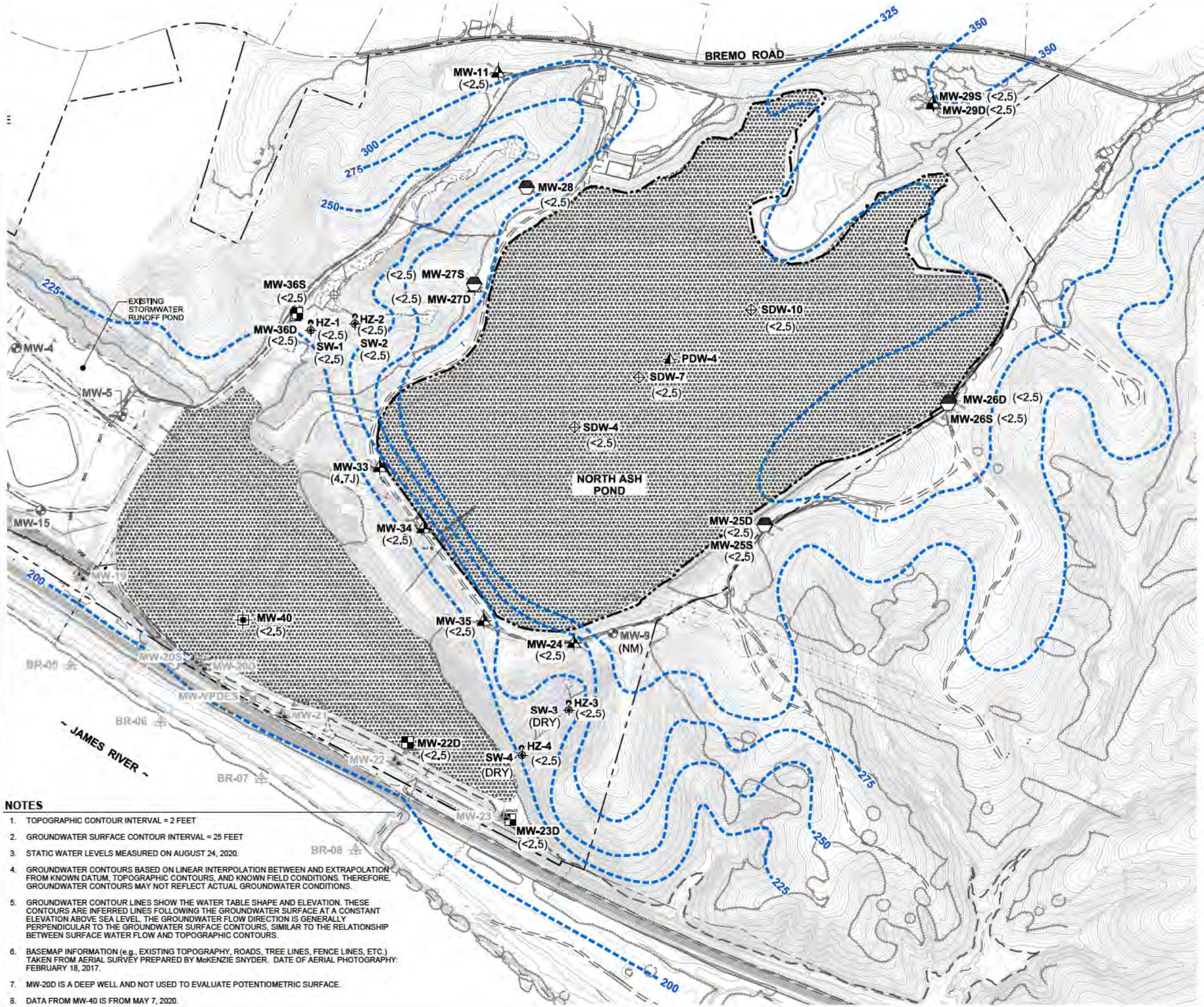
TITLE
NORTH POND NICKEL ISOCONCENTRATION CONTOURS
AUGUST - SEPTEMBER 2020

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 9

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



LEGEND

	APPROXIMATE PROPERTY BOUNDARY
	EXISTING TOPOGRAPHIC CONTOURS (2' INTERVALS) (FROM AERIAL SURVEY - SEE NOTE 6)
	WETLANDS
	APPROXIMATE LIMITS OF EXISTING ASH PONDS
	APPROXIMATE LIMITS OF NORTH ASH POND FILL
	LIMITS OF 100-YR FLOOD PLAIN
MW-24	EX. FEDERAL CCR RULE COMPLIANCE WELL LOCATION AND IDENTIFICATION
MW-25D	EX. STATE SENTINEL WELL LOCATION AND IDENTIFICATION
MW-4	EX. VPDES MONITORING WELL LOCATION AND IDENTIFICATION
MW-36S	GROUNDWATER OBSERVATION WELL LOCATION AND IDENTIFICATION
(4.7J)	SILVER CONCENTRATION IN ug/L
(NM)	NOT MEASURED
SW-4	SURFACE WATER LOCATION
PDW-4	DEWATERING WELLS
SDW-7	DEWATERING WELLS
HZ-3	EX. HYPORHEIC ZONE WELL
300	POTENTIOMETRIC SURFACE CONTOURS
	APPROXIMATE GROUNDWATER FLOW LINE
BR-05	JAMES RIVER MONITORING POINTS
MW-40	CLOSURE DEMONSTRATION WELL

NOTES

1. TOPOGRAPHIC CONTOUR INTERVAL = 2 FEET
2. GROUNDWATER SURFACE CONTOUR INTERVAL = 25 FEET
3. STATIC WATER LEVELS MEASURED ON AUGUST 24, 2020.
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.
7. MW-20D IS A DEEP WELL AND NOT USED TO EVALUATE POTENTIOMETRIC SURFACE.
8. DATA FROM MW-40 IS FROM MAY 7, 2020.

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

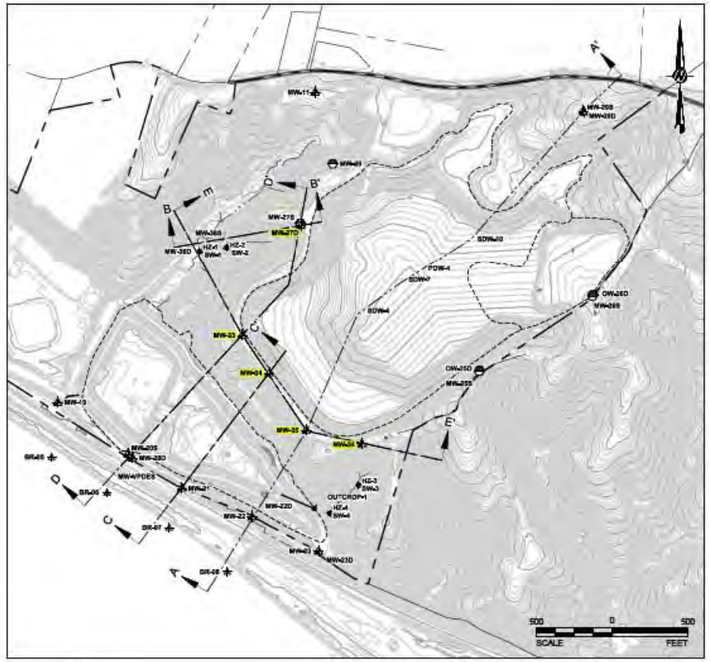
TITLE
NORTH POND SILVER ISOCONCENTRATION CONTOURS
JUNE - AUGUST 2020

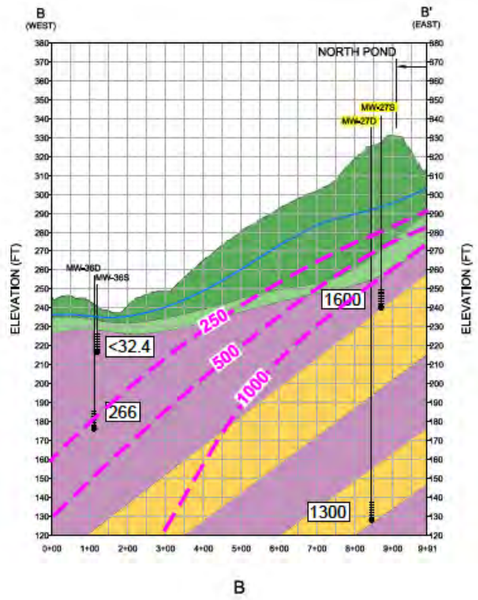
CONSULTANT
GOLDER
MEMBER OF WSP

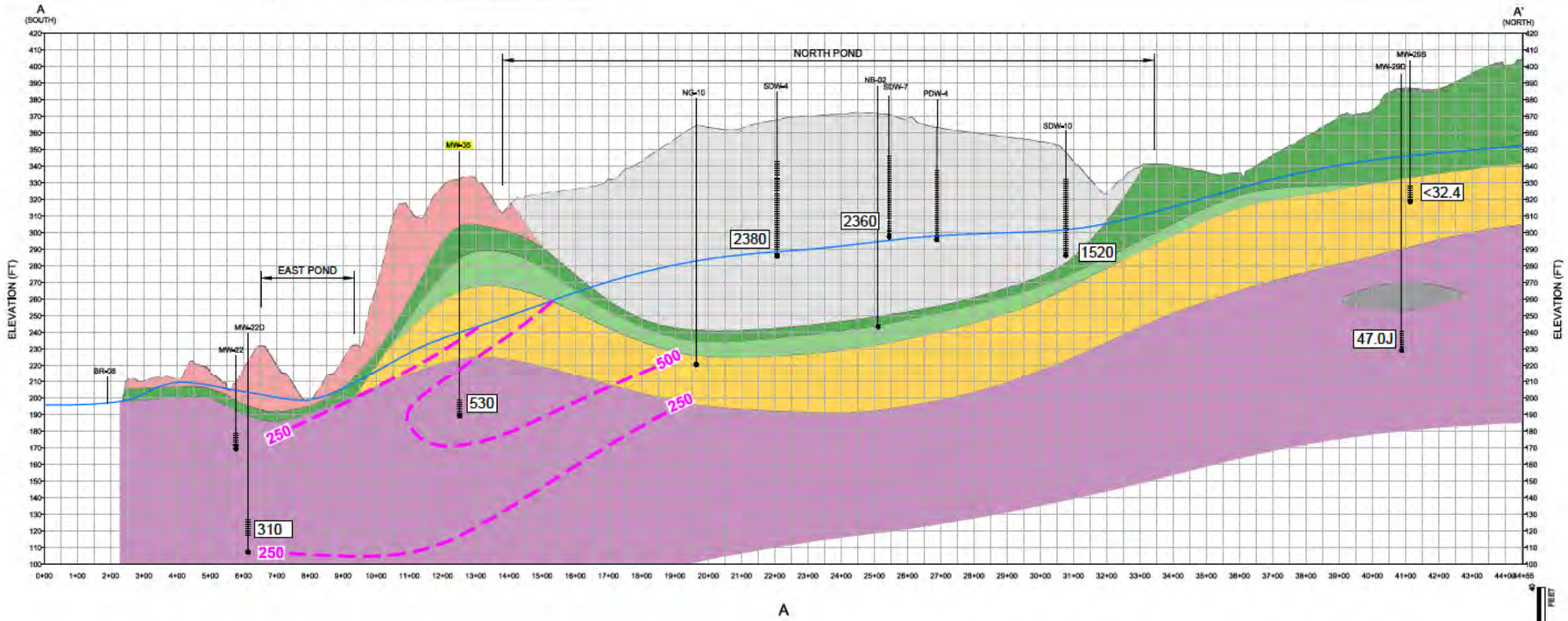
YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 10

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







NOTES

1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 1300 — BORON IN ug/L
- 250 — BORON CONCENTRATION ug/L
- MW-35 — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- MW-24 — SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS A-A' AND B-B'
- BORON ISOCONCENTRATION MAP

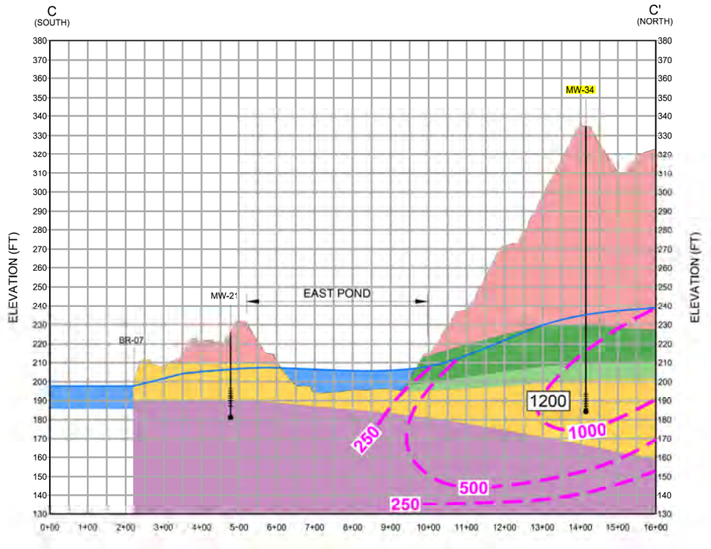
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 11

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

Path: G:\Plan Production Data Files\20-139823\1970_Bremo-ASB\Work\WA-drive Drawings\20139823 1970_12.dwg



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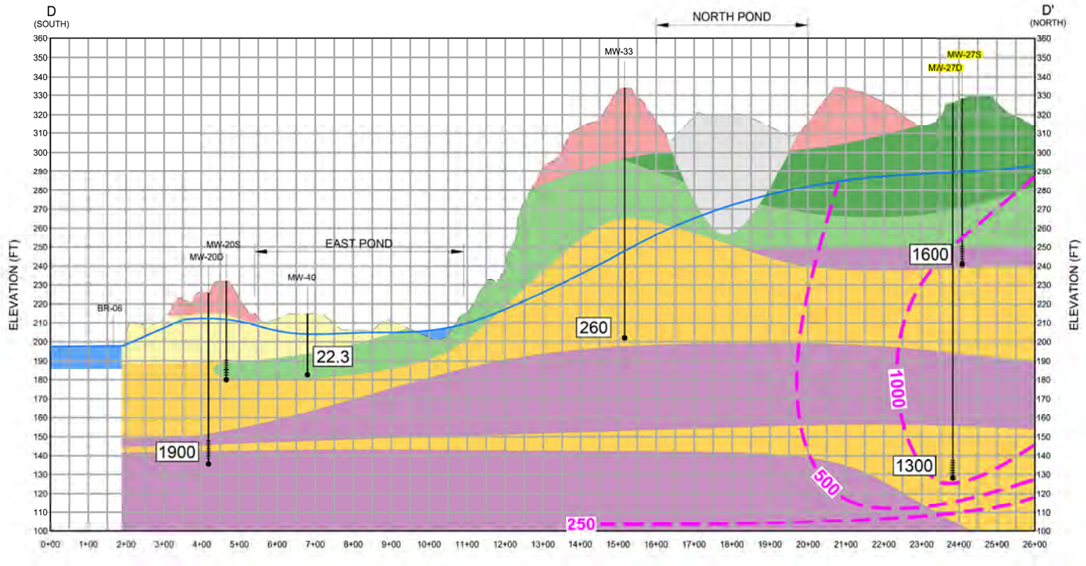
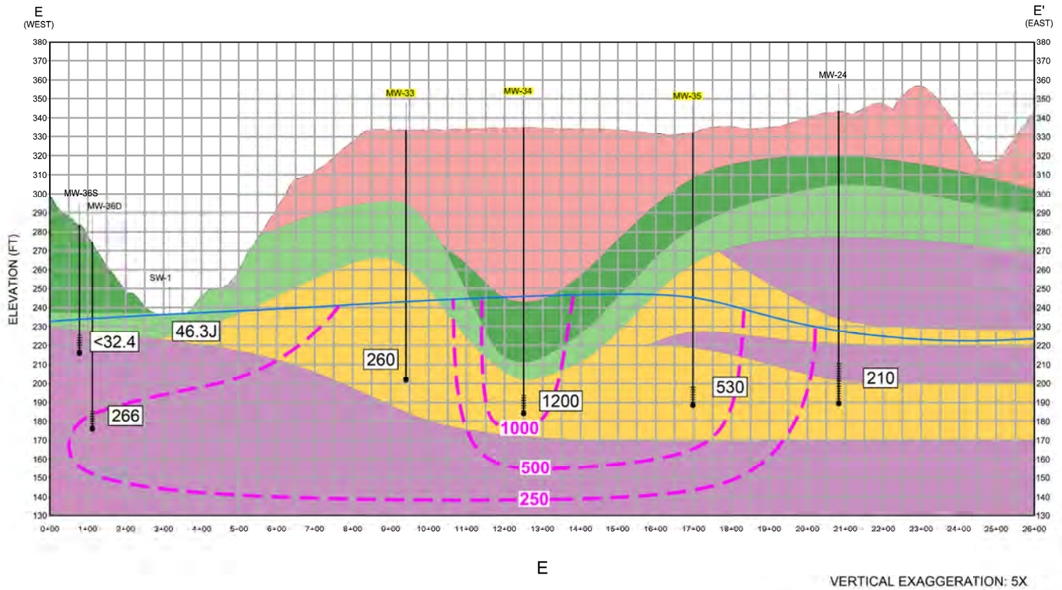


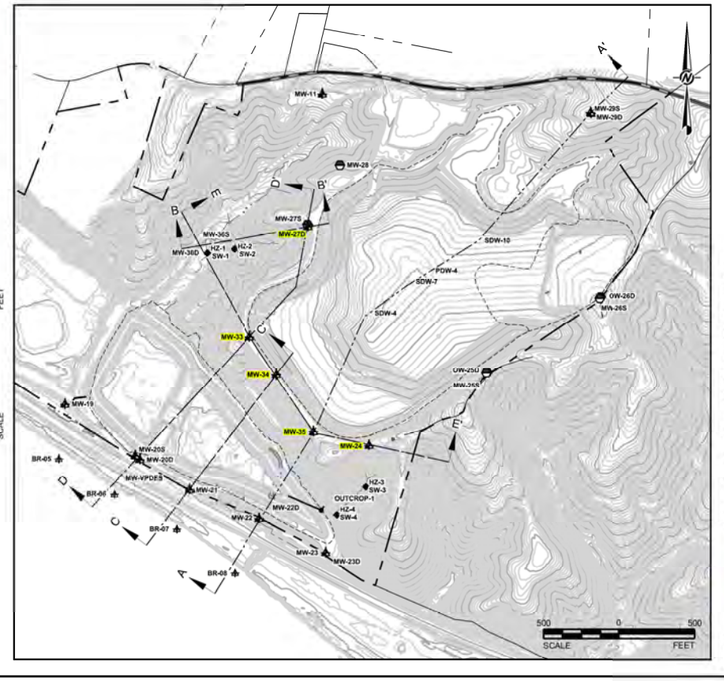
D



E

VERTICAL EXAGGERATION: 5X

SCALE 200 0 200 400 FEET



NOTES

1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 1300 — BORON IN ug/L
- 250 — BORON CONCENTRATION ug/L
- MW-35 — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- MW-24 — SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS C-C', D-D' AND E-E'
- BORON ISOCONCENTRATION MAP

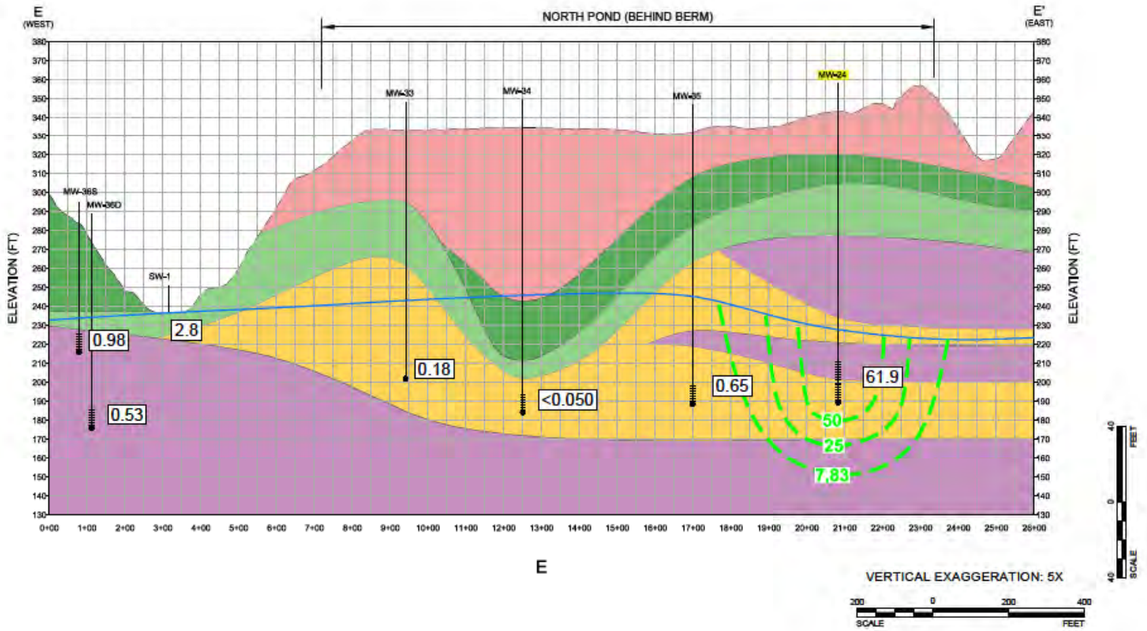
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 12

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\20+139\G321\G321-070_12.dwg



NOTES

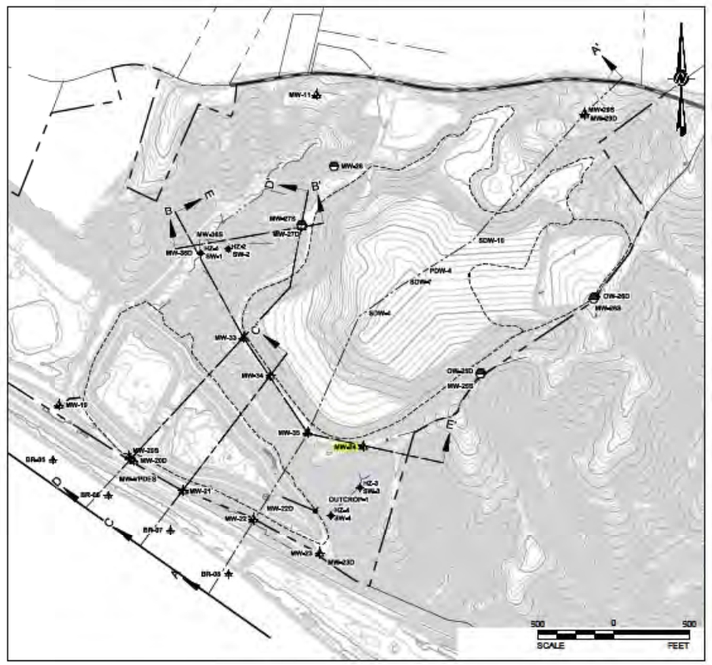
1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 61.9 — COBALT IN ug/L
- 7.83 — COBALT CONCENTRATION ug/L
- MW-24 — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- MW-24 — SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION



CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS E-E'
- COBALT ISOCONCENTRATION MAP

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

ROJECT NO. 20-139823 | REV. 1.0 | FIGURE 13

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

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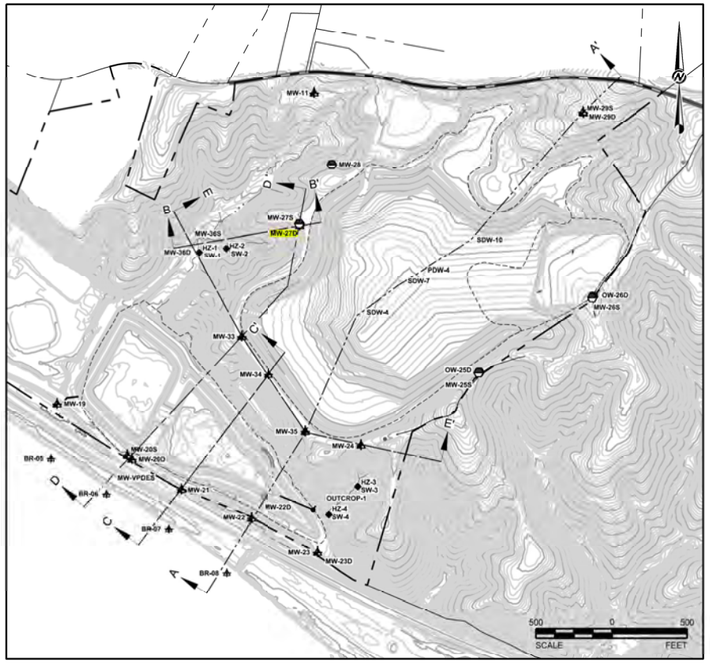
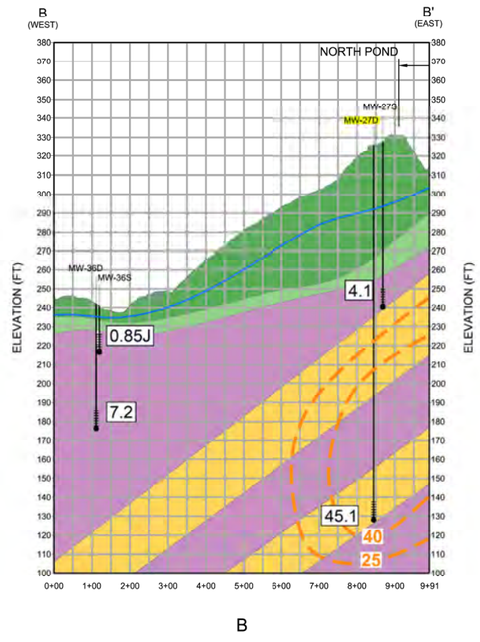
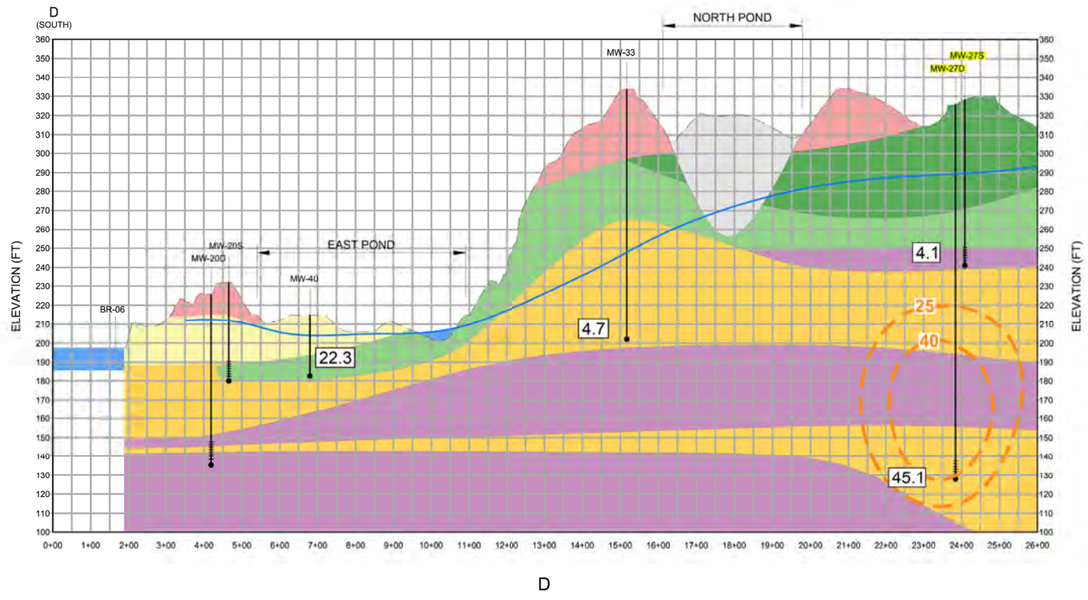




B



D

NOTES

1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 45.1 — LITHIUM IN ug/L
- 40 — LITHIUM CONCENTRATION ug/L
- MW-27D — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- MW-27D — SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION

VERTICAL EXAGGERATION: 5X

200 0 200 400
SCALE FEET

40 0 40
FEET
SCALE

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS B-B' AND D-D'
- LITHIUM ISOCONCENTRATION MAP

CONSULTANT
GOLDER
MEMBER OF WSP

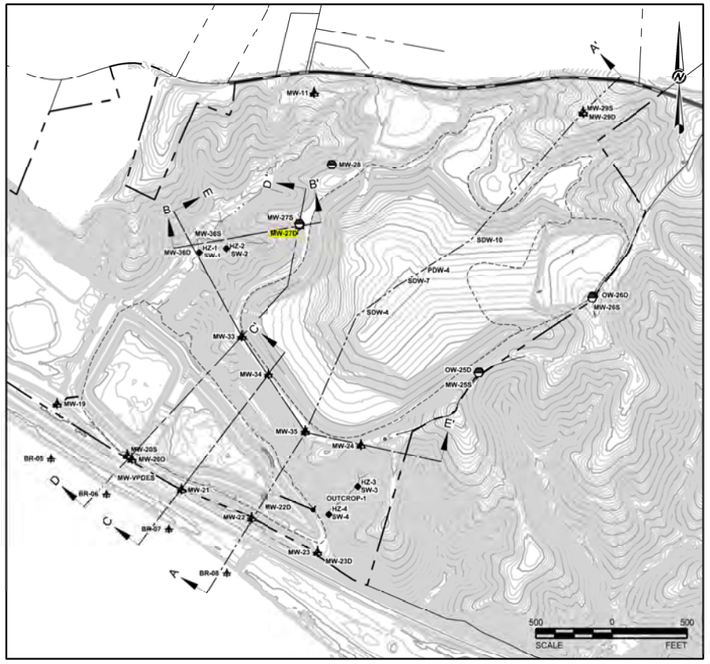
YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

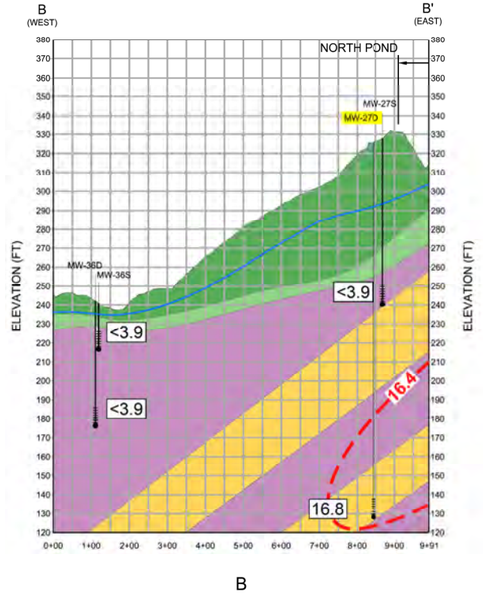
PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 14

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

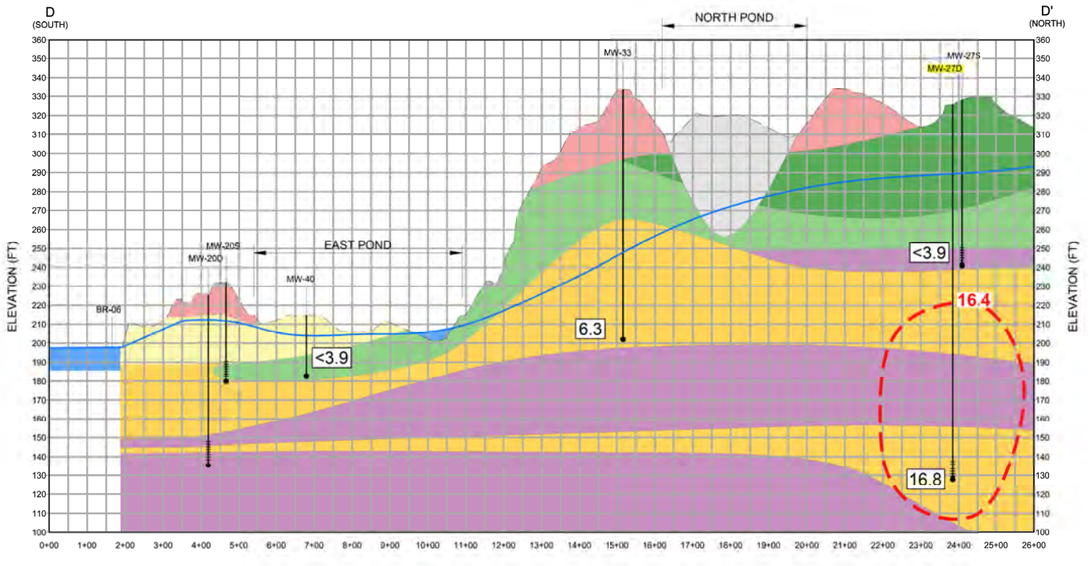
0 1in

Path: G:\Plan Production Data Files\Drawing Data Files\20-139823\21070 Bremo-NES\mxd\Active Drawings\20139823_21_070_14.dwg





B



D

NOTES

1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 16.8 — MOLYBDENUM IN ug/L
- 16.4 — MOLYBDENUM CONCENTRATION ug/L
- MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION

VERTICAL EXAGGERATION: 5X

40 0 40 FEET SCALE

200 0 200 400 SCALE FEET

CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS B-B' AND D-D'
- MOLYBDENUM ISOCONCENTRATION MAP

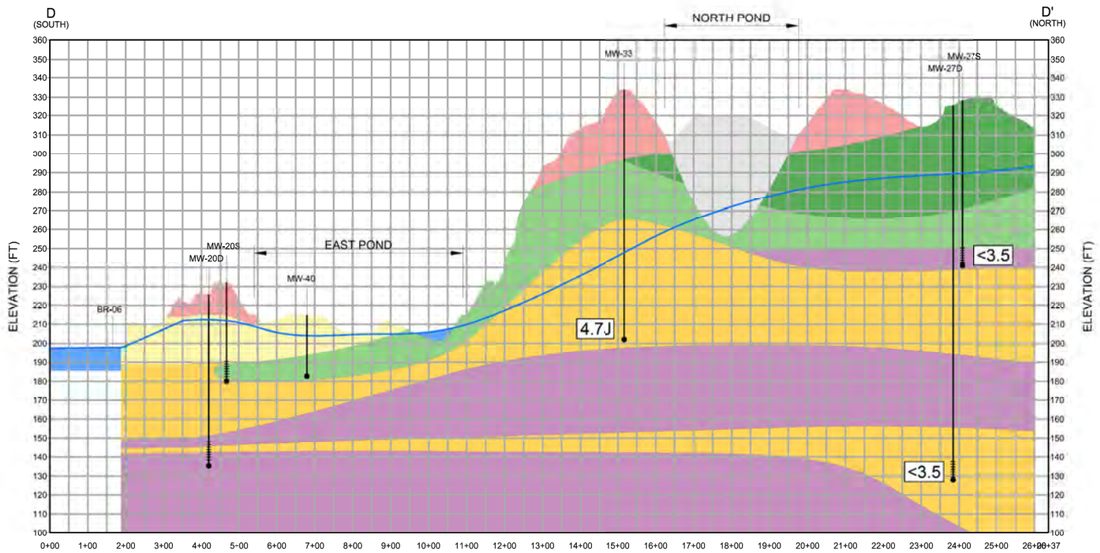
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

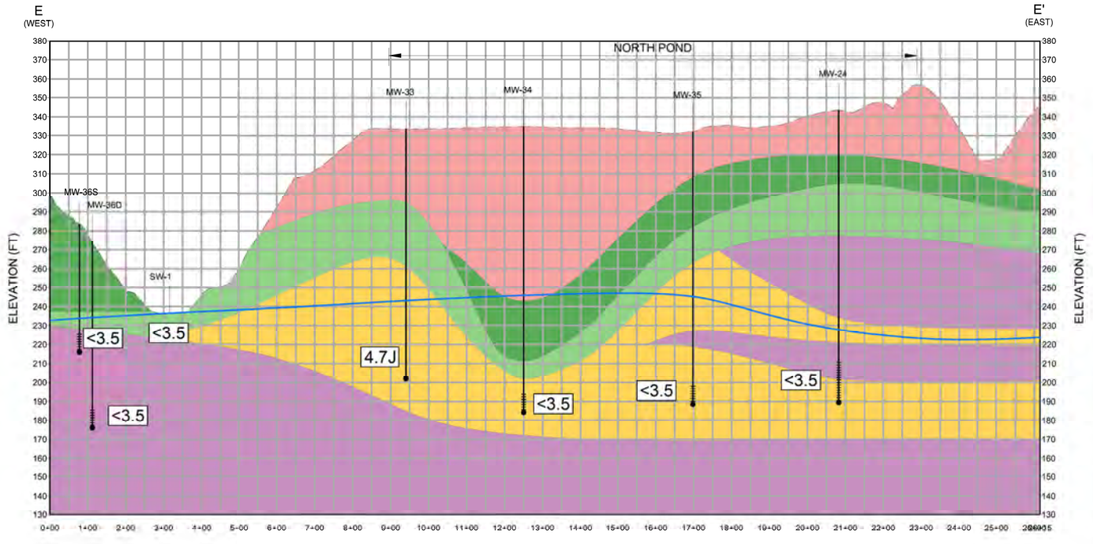
PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 15

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

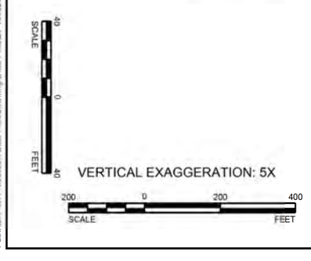
Path: G:\Plan Production Data Files\Drawing Data Files\20+139823\21070 Bremo-NES\north\Active Drawings\20139823210_070_15.dwg



D



E



VERTICAL EXAGGERATION: 5X

NOTES

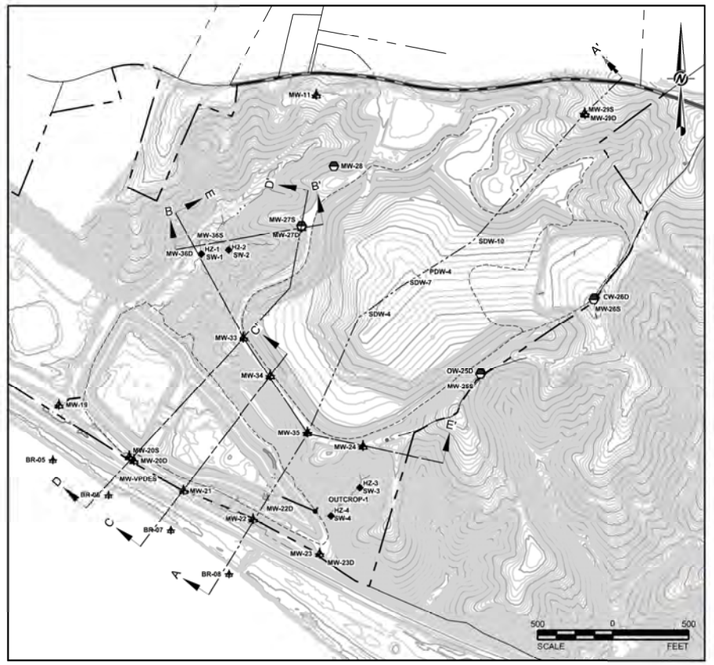
1. WATER TABLE SURFACE BASED ON LINEAR INTERPOLATION BETWEEN AND EXTRAPOLATION FROM KNOWN DATUM, TOPOGRAPHIC CONTOURS AND KNOWN FIELD CONDITIONS. THEREFORE, WATER TABLE SURFACE MAY NOT REFLECT ACTUAL GROUND WATER CONDITIONS.

LEGEND

- EXISTING GROUND
- GROUND WATER
- COAL COMBUSTION RESIDUALS (CCR)
- PARTIALLY WEATHERED BEDROCK
- BERM MATERIAL
- SAPROLITE
- ALLUVIUM

BEDROCK

- PORPHYROBLASTIC BIOTITE AND BIOTITE-GARNET SCHIST
- GNEISSIC QUARTZ DIORITE, GRANODIORITE, AND SOME GRANITE
- 4.7J — NICKEL IN ug/L
- 8.4 — NICKEL CONCENTRATION ug/L
- MW-33 — MONITORING WELL WITH BORON GROUNDWATER PROTECTION STANDARD EXCEEDED
- MW-33 — SOIL BORING IDENTIFICATION
- SOIL BORING GRADE
- SCREENED INTERVAL
- SOIL BORING TERMINATION



CLIENT
DOMINION ENERGY
BREMO POWER STATION
FLUVANNA COUNTY, VIRGINIA

PROJECT
NATURE AND EXTENT STUDY ADDENDUM
NORTH POND

TITLE
GEOLOGIC CROSS SECTIONS D-D' AND E-E'
- NICKEL ISOCONCENTRATION CONTOURS

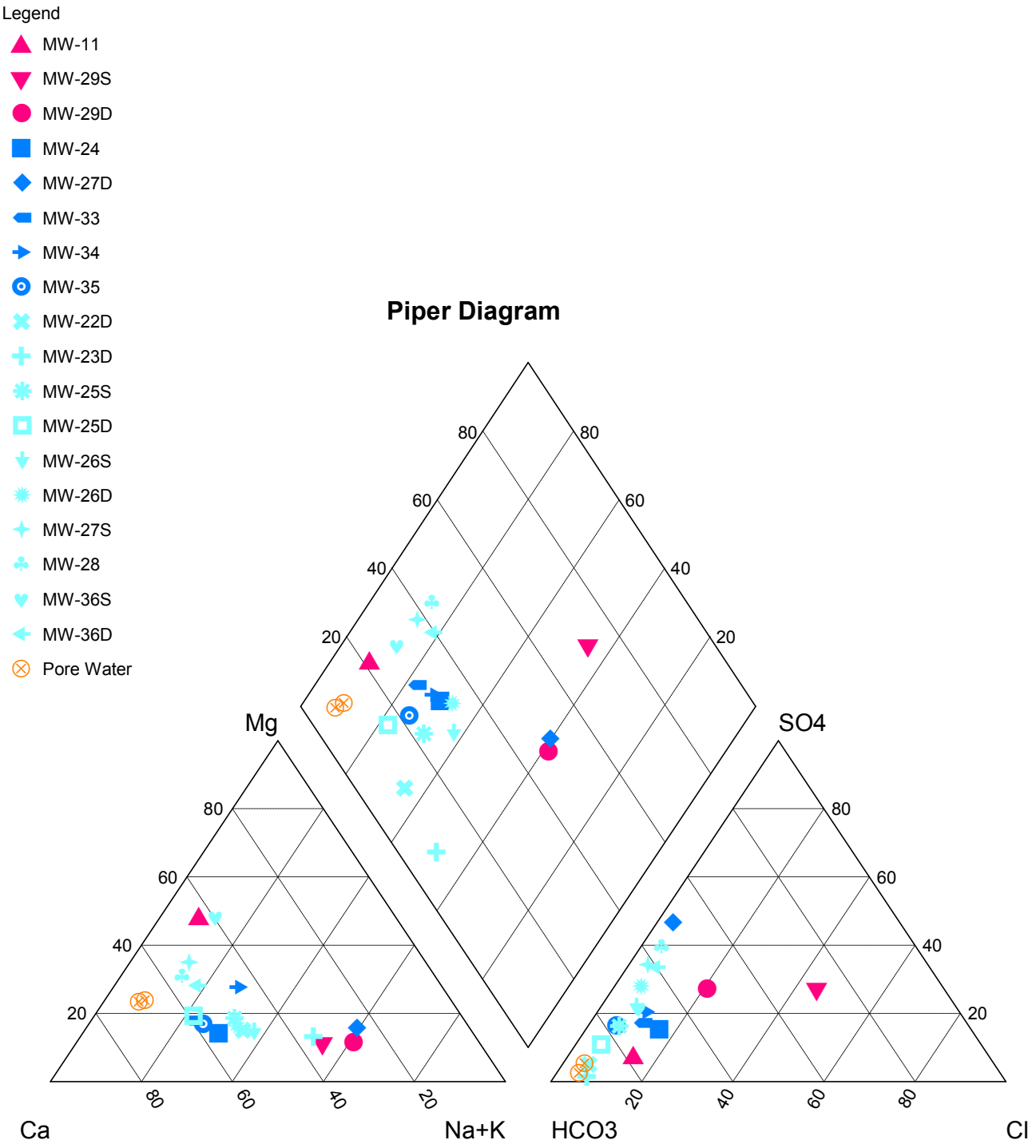
CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2021-10-05
DESIGNED	ALR
PREPARED	SIB
REVIEWED	MGW
APPROVED	MGW

PROJECT NO. 20-139823 | REV. 1.0 | FIGURE 16

Path: G:\Print Production Data Files\Drawing\Data Files\20+139823\21\070_Bremo-NES\north\Active Drawings\20139823210700_16.dwg
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D
0 1 in

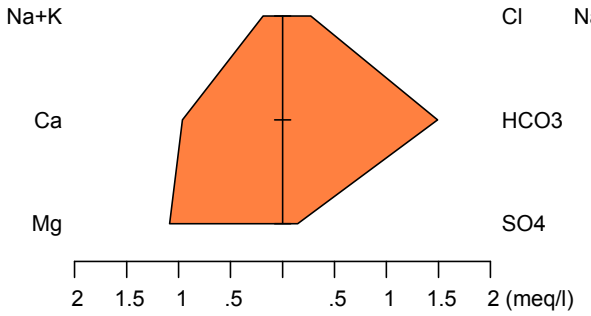
Charts



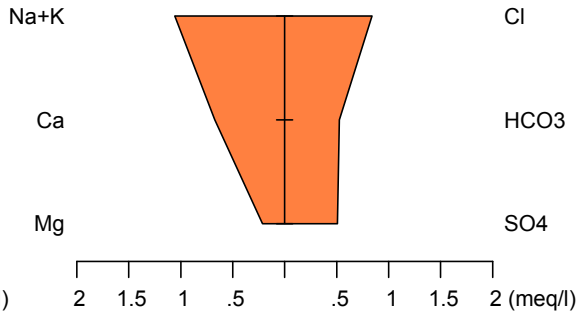
DESCRIPTION: Chart 1 - Piper Diagram

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020

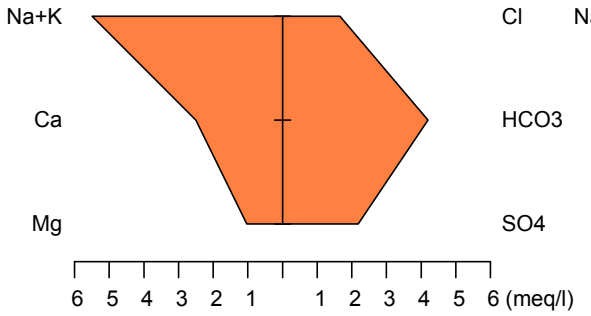
MW-11, Upgradient Well



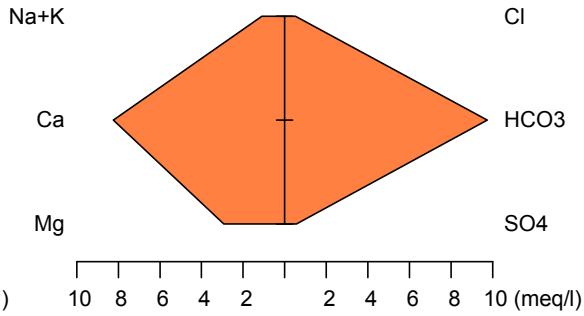
MW-29S, Upgradient Well



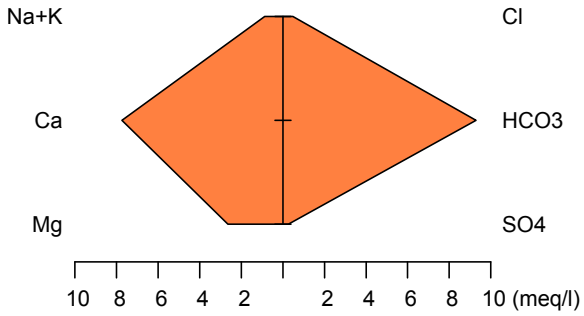
MW-29D, Upgradient Well



SDW-4, Pore Water



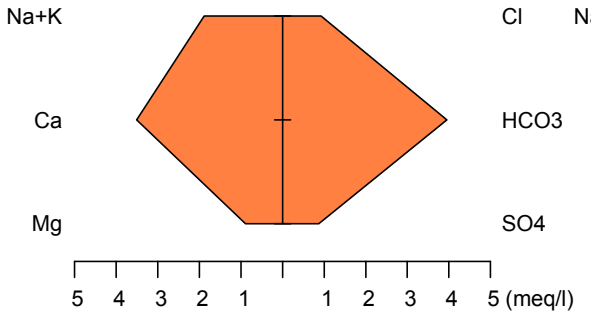
SDW-7, Pore Water



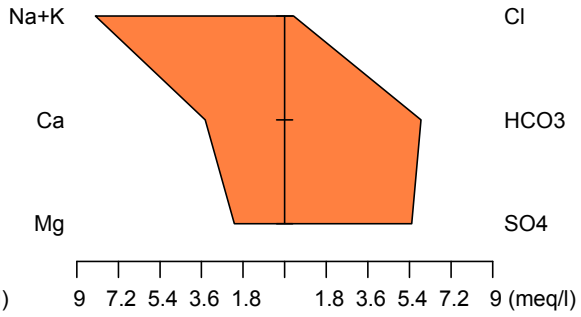
DESCRIPTION: Chart 2 - Stiff Diagrams - Upgradient Wells and Pore Water

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020

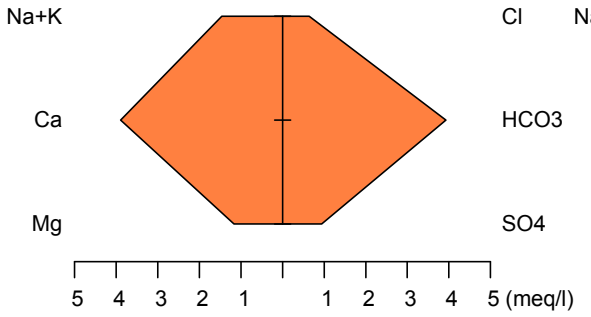
MW-24, Downgradient Well



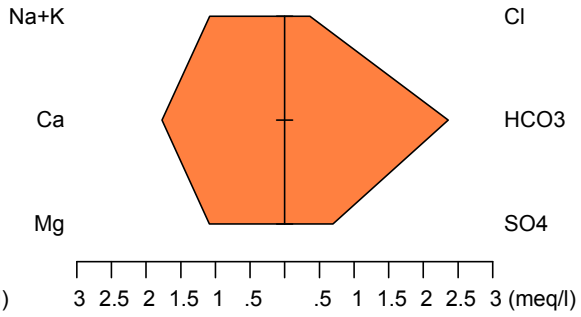
MW-27D, Downgradient Well



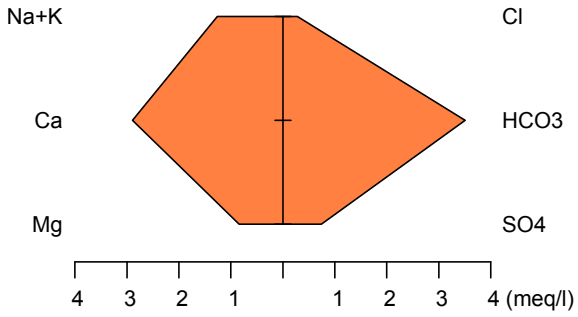
MW-33, Downgradient Well



MW-34, Downgradient Well



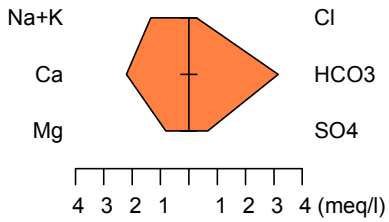
MW-35, Downgradient Well



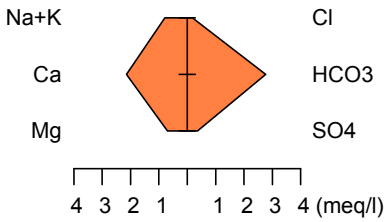
DESCRIPTION: Chart 3 - Stiff Diagrams - Downgradient Wells

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020

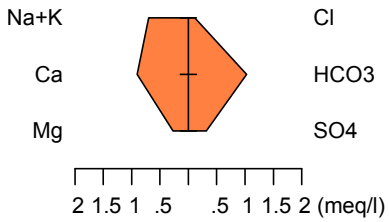
MW-25S, Sentinel Well



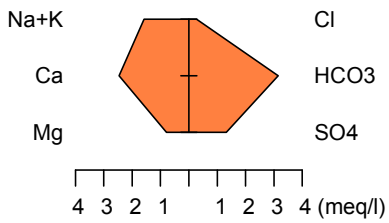
MW-25D, Sentinel Well



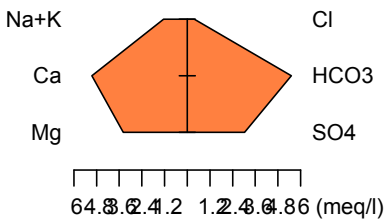
MW-26S, Sentinel Well



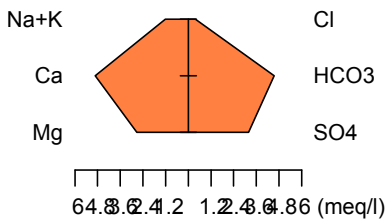
MW-26D, Sentinel Well



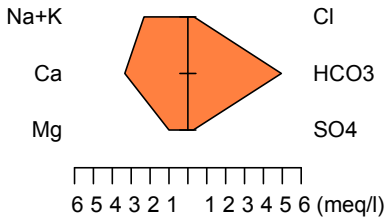
MW-27S, Sentinel Well



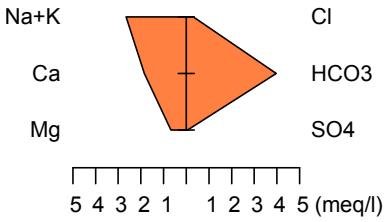
MW-28, Sentinel Well



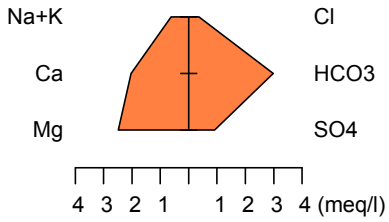
MW-22D, Observation Well



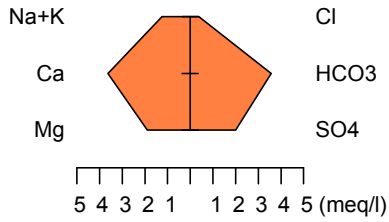
MW-23D, Observation Well



MW-36S, Observation Well



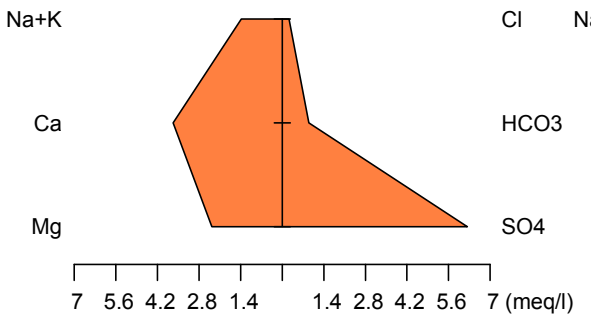
MW-36D, Observation Well



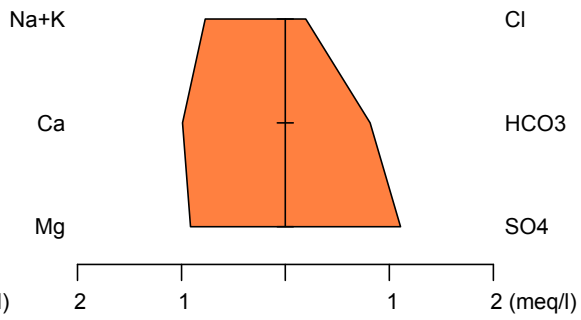
DESCRIPTION: Chart 4 - Stiff Diagrams - Sentinel and Observation Wells

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020

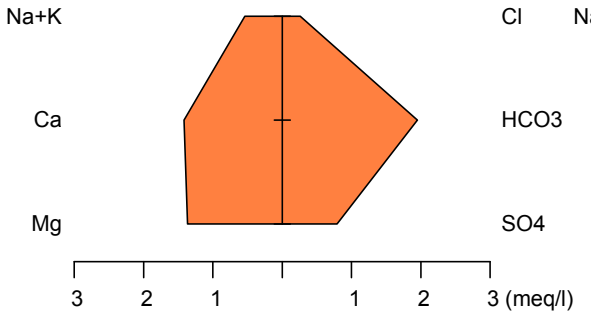
HZ-1, HZ Sample



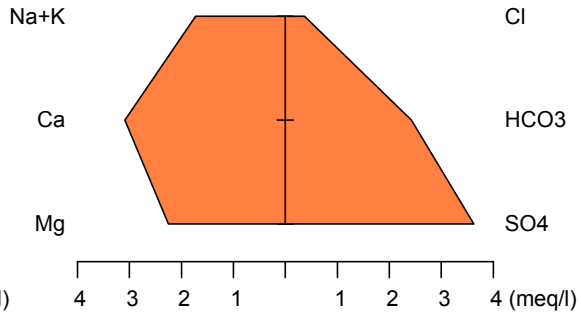
HZ-2, HZ Sample



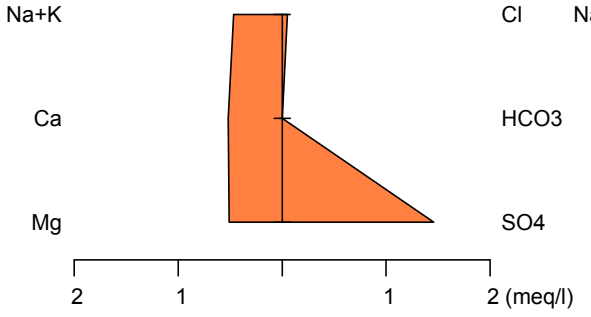
SW-1, Surface Water



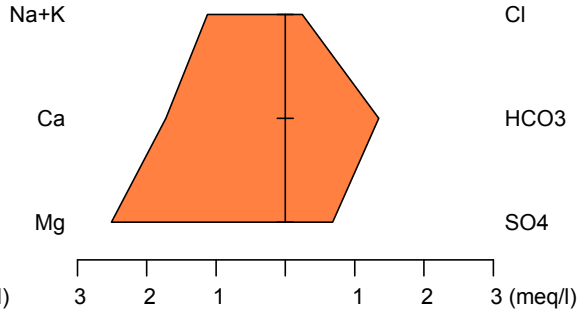
SW-2, Surface Water



HZ-3, HZ Sample

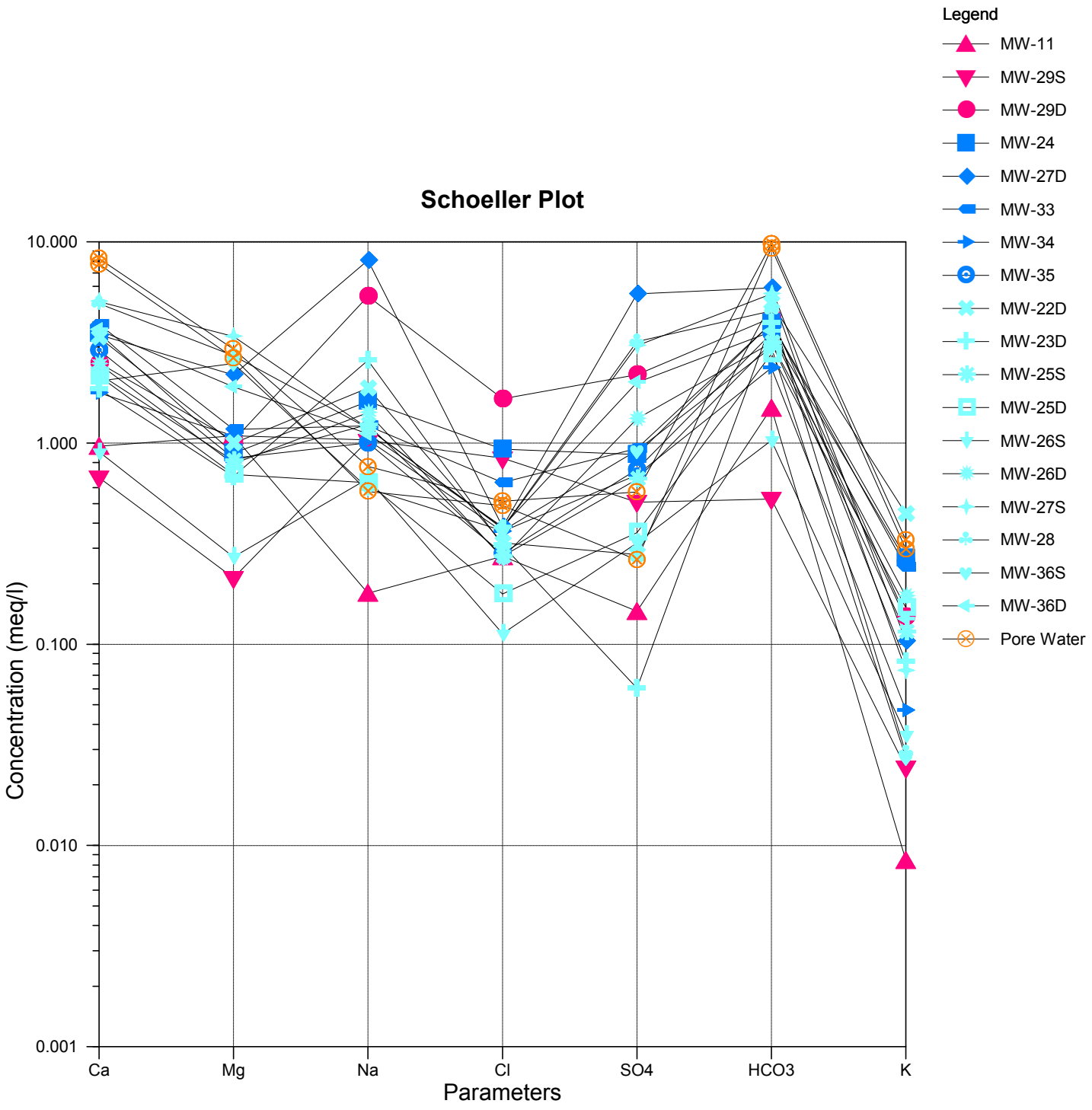


HZ-4, HZ Sample



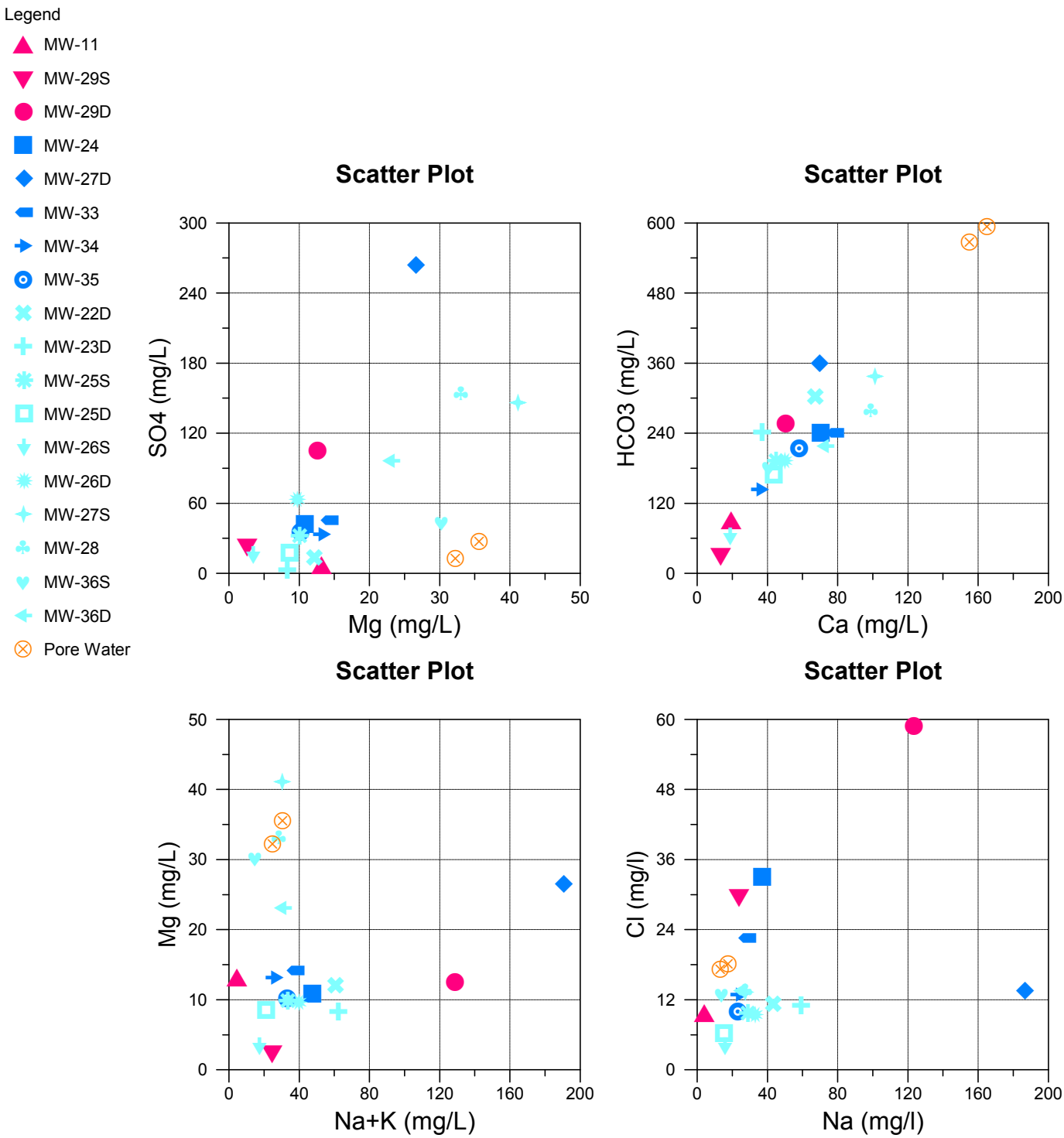
DESCRIPTION: Chart 5 - Stiff Diagrams - Hyporheic Zones and Surface Water

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020



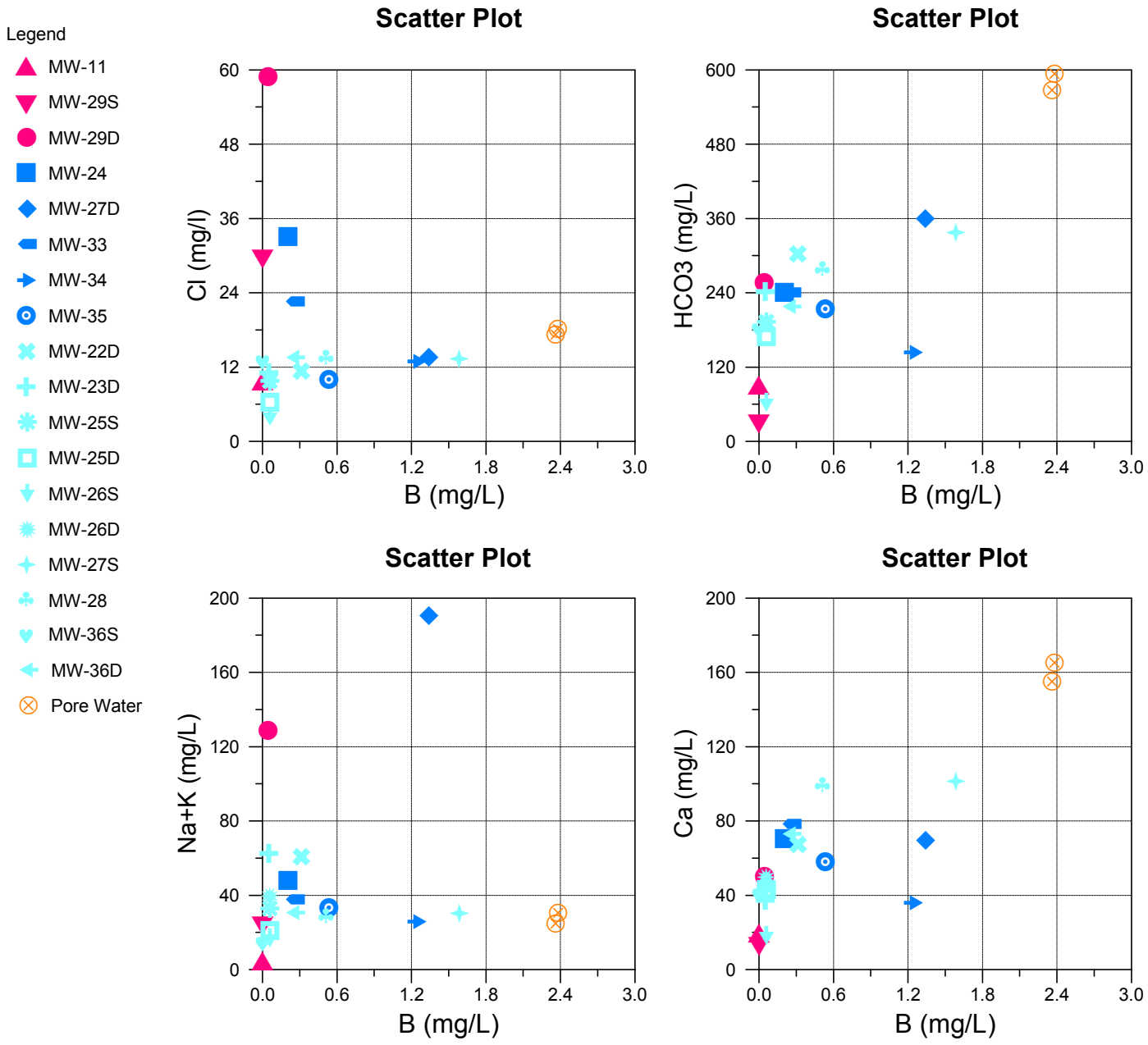
DESCRIPTION: Chart 6 - Schoeller Plot

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020



DESCRIPTION: Chart 7- Scatter Plots - Common Anions and Cations

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020



DESCRIPTION: Chart 8 - Scatter Plots - Boron vs. Common Anions and Cations

GOLDER	PROJECT: Bremo Power Station - North Pond NES	PROJECT NO: 20139823.800C
	CLIENT: Dominion Energy	DATE: November 1, 2020

Appendix A

Laboratory Certificates of Analysis and Chain-of-Custody Forms - Second-Semi Annual Monitoring Event (August 2020)

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

September 28, 2020

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

RE: Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville
- Pace Analytical Services - Eden
- Pace Analytical Services - Greensburg

This revision was issued on 9/28/20 to update reporting units, per client request.

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.

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CERTIFICATIONS

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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
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

Pace Analytical Services Asheville
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 Eden
205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738
North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

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SAMPLE SUMMARY

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492169001	**MW-11**	Water	08/24/20 12:40	08/24/20 16:20

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492169001	**MW-11**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A

PASI-A = Pace Analytical Services - Asheville
PASI-E = Pace Analytical Services - Eden
PASI-PA = Pace Analytical Services - Greensburg

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492169001	**MW-11**					
SM 2540C-2011	Total Dissolved Solids	144	mg/L	25.0	08/27/20 09:43	
EPA 6010D	Barium	3.6J	ug/L	5.0	09/01/20 04:00	
EPA 6010D	Calcium	20300	ug/L	100	09/01/20 04:00	
EPA 6010D	Hardness, Total(SM 2340B)	106000	ug/L	662	09/01/20 04:00	
EPA 6010D	Vanadium	11.3	ug/L	5.0	09/01/20 04:00	
EPA 6020B	Cobalt	0.60	ug/L	0.10	08/31/20 22:45	
EPA 6020B	Iron	593	ug/L	50.0	08/31/20 22:45	
EPA 6020B	Manganese	6.5	ug/L	0.50	08/31/20 22:45	
EPA 9315	Radium-226	0.0937 ± 0.102 (0.189) C:83% T:NA	pCi/L		09/08/20 18:03	
EPA 9320	Radium-228	0.277 ± 0.382 (0.818) C:69% T:83%	pCi/L		09/11/20 11:45	
Total Radium Calculation	Total Radium	0.371 ± 0.484 (1.01)	pCi/L		09/14/20 14:03	
EPA 9056A	Chloride	8.8	mg/L	1.0	08/25/20 16:36	
EPA 9056A	Sulfate	6.8	mg/L	1.0	08/25/20 16:36	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Sample: MW-11 **Lab ID: 92492169001** Collected: 08/24/20 12:40 Received: 08/24/20 16:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**144**	mg/L	25.0	25.0	1		08/27/20 09:43		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:00	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:00	7440-38-2	
Barium	**3.6J**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:00	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:00	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:00	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:00	7440-43-9	
Calcium	**20300**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:00	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:00	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:00	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:00	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:00	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:00	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:00	7440-22-4	
Hardness, Total(SM 2340B)	**106000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:00		
Vanadium	**11.3**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:00	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:00	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.60**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:45	7440-48-4	
Iron	**593**	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 22:45	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 22:45	7439-92-1	
Lithium	ND	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 22:45	7439-93-2	
Manganese	**6.5**	ug/L	0.50	0.47	1	08/28/20 01:18	08/31/20 22:45	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:45	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 22:45	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/25/20 16:14	08/26/20 13:19	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 10:30	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**8.8**	mg/L	1.0	0.60	1		08/25/20 16:36	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/25/20 16:36	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/25/20 16:36	14797-55-8	

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(704)875-9092

ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Sample: MW-11 **Lab ID: 92492169001** Collected: 08/24/20 12:40 Received: 08/24/20 16:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**6.8**	mg/L	1.0	0.50	1		08/25/20 16:36	14808-79-8	

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(704)875-9092

QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 562744
QC Batch Method: SM 2540C-2011
Analysis Method: SM 2540C-2011
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492169001

METHOD BLANK: 2984270 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/27/20 09:38	

LABORATORY CONTROL SAMPLE: 2984271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2984272

Parameter	Units	92492617001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	347	336	3	25	

SAMPLE DUPLICATE: 2984273

Parameter	Units	92492363002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	408	5	25	

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.

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 562246
QC Batch Method: EPA 7470A
Analysis Method: EPA 7470A
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492169001

METHOD BLANK: 2982034 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.12	08/26/20 12:50	

LABORATORY CONTROL SAMPLE: 2982035

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2982036 2982037

Parameter	Units	92491985011 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	2.2	90	88	75-125	3	25	

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.

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 563337
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492169001

METHOD BLANK: 2986933 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.0	09/01/20 03:34	
Arsenic	ug/L	ND	10.0	4.7	09/01/20 03:34	
Barium	ug/L	ND	5.0	3.5	09/01/20 03:34	
Beryllium	ug/L	ND	1.0	0.70	09/01/20 03:34	
Boron	ug/L	ND	50.0	32.4	09/01/20 03:34	
Cadmium	ug/L	ND	1.0	0.40	09/01/20 03:34	
Calcium	ug/L	ND	100	94.2	09/01/20 03:34	
Chromium	ug/L	ND	5.0	3.7	09/01/20 03:34	
Copper	ug/L	ND	5.0	4.3	09/01/20 03:34	
Hardness, Total(SM 2340B)	ug/L	ND	662	131	09/01/20 03:34	
Molybdenum	ug/L	ND	5.0	3.9	09/01/20 03:34	
Nickel	ug/L	ND	5.0	3.5	09/01/20 03:34	
Selenium	ug/L	ND	10.0	4.7	09/01/20 03:34	
Silver	ug/L	ND	5.0	2.5	09/01/20 03:34	
Vanadium	ug/L	ND	5.0	3.9	09/01/20 03:34	
Zinc	ug/L	ND	10.0	9.5	09/01/20 03:34	

LABORATORY CONTROL SAMPLE: 2986934

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	505	101	80-120	
Arsenic	ug/L	500	507	101	80-120	
Barium	ug/L	500	511	102	80-120	
Beryllium	ug/L	500	519	104	80-120	
Boron	ug/L	500	494	99	80-120	
Cadmium	ug/L	500	506	101	80-120	
Calcium	ug/L	5000	5040	101	80-120	
Chromium	ug/L	500	506	101	80-120	
Copper	ug/L	500	517	103	80-120	
Hardness, Total(SM 2340B)	ug/L	33100	33100	100	80-120	
Molybdenum	ug/L	500	516	103	80-120	
Nickel	ug/L	500	511	102	80-120	
Selenium	ug/L	500	500	100	80-120	
Silver	ug/L	250	251	100	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	492	98	80-120	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986935 2986936

Parameter	Units	92492846001 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	513	511	103	102	75-125	0	20	
Arsenic	ug/L	ND	500	500	531	536	106	107	75-125	1	20	
Barium	ug/L	14.4	500	500	534	531	104	103	75-125	1	20	
Beryllium	ug/L	ND	500	500	532	528	106	106	75-125	1	20	
Boron	ug/L	ND	500	500	526	525	104	104	75-125	0	20	
Cadmium	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Calcium	ug/L	2.9 mg/L	5000	5000	8130	8110	104	104	75-125	0	20	
Chromium	ug/L	ND	500	500	521	525	104	105	75-125	1	20	
Copper	ug/L	ND	500	500	524	523	104	104	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	15800	33100	33100	50000	50100	103	104	75-125	0		
Molybdenum	ug/L	ND	500	500	526	524	105	105	75-125	1	20	
Nickel	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Selenium	ug/L	ND	500	500	535	538	107	107	75-125	1	20	
Silver	ug/L	ND	250	250	258	258	103	103	75-125	0	20	
Vanadium	ug/L	ND	500	500	516	520	103	104	75-125	1	20	
Zinc	ug/L	ND	500	500	527	531	105	106	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986937 2986938

Parameter	Units	92492363002 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	518	515	104	103	75-125	1	20	
Arsenic	ug/L	7.7J	500	500	543	538	107	106	75-125	1	20	
Barium	ug/L	98.5	500	500	614	605	103	101	75-125	1	20	
Beryllium	ug/L	ND	500	500	531	518	106	104	75-125	3	20	
Boron	ug/L	0.21 mg/L	500	500	735	727	106	104	75-125	1	20	
Cadmium	ug/L	ND	500	500	524	515	105	103	75-125	2	20	
Calcium	ug/L	70.3 mg/L	5000	5000	74400	73200	82	56	75-125	2	20	M1
Chromium	ug/L	ND	500	500	512	498	102	100	75-125	3	20	
Copper	ug/L	ND	500	500	530	528	106	105	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	222000	33100	33100	252000	248000	93	80	75-125	2		
Molybdenum	ug/L	9.3	500	500	540	530	106	104	75-125	2	20	
Nickel	ug/L	ND	500	500	511	500	102	100	75-125	2	20	
Selenium	ug/L	5.3J	500	500	532	533	105	106	75-125	0	20	
Silver	ug/L	ND	250	250	258	253	103	101	75-125	2	20	
Vanadium	ug/L	ND	500	500	523	508	105	102	75-125	3	20	
Zinc	ug/L	ND	500	500	518	501	103	100	75-125	3	20	

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

QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492169001

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	08/31/20 22:26	
Iron	ug/L	ND	50.0	20.9	08/31/20 22:26	
Lead	ug/L	ND	0.10	0.077	08/31/20 22:26	
Lithium	ug/L	ND	2.5	0.39	08/31/20 22:26	
Manganese	ug/L	ND	0.50	0.47	08/31/20 22:26	
Thallium	ug/L	ND	0.10	0.050	08/31/20 22:26	
Tin	ug/L	ND	0.50	0.24	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	
Iron	ug/L	625	660	106	80-120	
Lead	ug/L	50	49.8	100	80-120	
Lithium	ug/L	50	47.3	95	80-120	
Manganese	ug/L	50	51.8	104	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	50.5	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	61.9	10	10	76.5	73.6	146	118	75-125	4	20	M6
Iron	ug/L	17300	625	625	18700	18300	229	157	75-125	2	20	M6
Lead	ug/L	ND	50	50	49.2	50.3	98	101	75-125	2	20	
Lithium	ug/L	2.8	50	50	46.9	46.5	88	87	75-125	1	20	
Manganese	ug/L	3530	50	50	3800	3680	537	298	75-125	3	20	M6
Thallium	ug/L	ND	10	10	10	10.2	100	102	75-125	2	20	
Tin	ug/L	ND	50	50	50.5	51.0	101	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 564668
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492169001

METHOD BLANK: 2993022 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/05/20 09:52	

LABORATORY CONTROL SAMPLE: 2993023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993024 2993025

Parameter	Units	92493815001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.9	4.9	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993026 2993027

Parameter	Units	92493865003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	3.8	5	5	8.5	8.5	95	96	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 562274
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492169001

METHOD BLANK: 2982196 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/25/20 16:09	
Fluoride	mg/L	ND	0.10	0.050	08/25/20 16:09	
Nitrate as N	mg/L	ND	0.10	0.060	08/25/20 16:09	
Sulfate	mg/L	ND	1.0	0.50	08/25/20 16:09	

LABORATORY CONTROL SAMPLE: 2982197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.6	95	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Nitrate as N	mg/L	2.5	2.3	93	90-110	
Sulfate	mg/L	50	48.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2982198 2982199

Parameter	Units	92492170001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	49.3	48.6	99	97	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	98	96	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.4	97	95	90-110	1	10	
Sulfate	mg/L	ND	50	50	49.3	48.6	99	97	90-110	2	10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Sample: MW-11 **Lab ID: 92492169001** Collected: 08/24/20 12:40 Received: 08/24/20 16:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.0937 ± 0.102 (0.189) C:83% T:NA**	pCi/L	09/08/20 18:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.277 ± 0.382 (0.818) C:69% T:83%**	pCi/L	09/11/20 11:45	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.371 ± 0.484 (1.01)**	pCi/L	09/14/20 14:03	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 412359
QC Batch Method: EPA 9315
Analysis Method: EPA 9315
Analysis Description: 9315 Total Radium
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492169001

METHOD BLANK: 1994519 Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0753 ± 0.0856 (0.159) C:96% T:NA	pCi/L	09/08/20 17:44	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

QC Batch: 411839
QC Batch Method: EPA 9320
Analysis Method: EPA 9320
Analysis Description: 9320 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492169001

METHOD BLANK: 1992208
Matrix: Water
Associated Lab Samples: 92492169001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.627 ± 0.369 (0.668) C:69% T:83%	pCi/L	09/11/20 11:43	

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QUALIFIERS

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

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.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (A)-Revised Report
Pace Project No.: 92492169

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492169001	**MW-11**	SM 2540C-2011	562744		
92492169001	**MW-11**	EPA 3010A	563337	EPA 6010D	563346
92492169001	**MW-11**	EPA 3010A	562977	EPA 6020B	562996
92492169001	**MW-11**	EPA 7470A	562246	EPA 7470A	562325
92492169001	**MW-11**	EPA 9315	412359		
92492169001	**MW-11**	EPA 9320	411839		
92492169001	**MW-11**	Total Radium Calculation	413734		
92492169001	**MW-11**	EPA 350.1 Rev 2.0 1993	564668		
92492169001	**MW-11**	EPA 9056A	562274		

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CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorde
M

WO# : 92492169

92492169

ALL SHADED /

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): ~~M. Taylor / C.~~ Joyner MT J. England	Purchase Order # : 20139823 Quote #: / DW PWS ID #: DW Location Code:
Collected By (signature): John England	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U	U	1	2	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 _____ (O1) Other 1 _____

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228			Lab Sample # / Comments
MW-11	GW	G	8/24/2020	1240			N	7	X	X	X	X	X	X	X	X			92492169 001

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ~~X~~ N NA
Custody Signatures Present ~~X~~ N NA
Collector Signature Present ~~X~~ N NA
Bottles Intact ~~X~~ N NA
Correct Bottles ~~X~~ N NA
Sufficient Volume ~~X~~ N NA
Samples Received on Ice ~~X~~ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ~~X~~ N NA
Residual Chlorine Present Y ~~X~~ NA
Cl Strips: _____
Sample pH Acceptable ~~X~~ NNA
pH Strips: _____
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group A for more details.

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 #:

Samples received via: FEDEX UPS Client (Courier) Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 4.9 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 4.9 oC
Comments:

Relinquished by/Company: (Signature) John England / Golder	Date/Time: 8/24/2020 1440	Received by/Company: (Signature)	Date/Time: 8/24/2020 2:24
Relinquished by/Company: (Signature)	Date/Time: 8/24/2020 4:20	Received by/Company: (Signature) Rachel Burruss	Date/Time: 8-24-20 1620
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: 1 of: 1

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, VA 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Analysis Detects Report

Date Issued:

Client Name:

Client Site ID:

Submitted To:

Laboratory Sample ID: **Client Sample ID:**

Parameter	Samp ID	Reference Method	Sample Results	Qual	DL	LOQ	Dil. Factor	Units

There are no reportable results for target analytes in this report.

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

AIR WATER & SOIL
an Enthalpy Analytical Laboratory
1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 20H1169

Client Name:	Golder Associates, Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	Date Received:	August 24, 2020 15:47
		Date Issued:	August 27, 2020 16:21
		Project Number:	20139823
Submitted To:	Amanda Reynolds	Purchase Order:	
Client Site I.D.:	Bremo Power Station		

Enclosed are the results of analyses for samples received by the laboratory on 08/24/2020 15:47. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars
Technical Director

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Air Water & Soil Laboratories, Inc.

ACCREDITED IN ACCORDANCE WITH nelac
Commonwealth of Virginia, DCLS
Accreditation # 460021

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/27/2020 4:21:06PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-11	20H1169-01	Ground Water	08/24/2020 12:40	08/24/2020 15:47

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 8/27/2020 4:21:06PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-11** **Laboratory Sample ID:** **20H1169-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/25/2020 07:53	08/25/2020 11:00	BLOD	U	5	5	1	ug/L	MWL

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Client Name: Golder Associates, Inc.
Date Issued: 8/27/2020 4:21:06PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Wet Chemistry Analysis - Quality Control

Air Water & Soil Laboratories, Inc.

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BDH0793 - No Prep Wet Chem										
Blank (BDH0793-BLK1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0793-BS1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	105	5	ug/L	100		105	80-120			
Matrix Spike (BDH0793-MS1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	96	5	ug/L	100	BLOD	96.0	80-120			
Matrix Spike Dup (BDH0793-MSD1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	97	5	ug/L	100	BLOD	97.0	80-120	1.04	20	

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
20H1169-01	100 mL / 100 mL	SW7196A	BDH0793	SDH0707	AH00108

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/27/2020 4:21:06PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Certified Analyses included in this Report

Analyte	Certifications
SW7196A in Non-Potable Water	
Chromium, Hexavalent	VELAP

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2020
NC	North Carolina DENR	495	12/31/2020
NJDEP	New Jersey DEP	VA015	06/30/2021
NYDOH	New York DOH Drinking Water	12096	04/01/2021
PADEP	NELAC-Pennsylvania Certificate #005	68-03503	10/31/2020
VELAP	NELAC-Virginia Certificate #10886	460021	06/14/2021
WVDEP	West Virginia DEP	350	11/30/2020

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/27/2020 4:21:06PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Qualifiers and Definitions

U	Analyte was not detected and is reported as less than the DL or as defined by the client. The DL has been adjusted for any dilution or concentration of the sample.
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

AIR WATER & SOIL LABORATORIES, INC.
1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: ~~2SA20~~ 3Q2020 Hex Chrome
CONTACT: A. Reynolds	INVOICE CONTACT:	SITE NAME: Bremo Power station
ADDRESS: 2108 W. Laburnum Ave., Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) ~~356~~ 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: amanda_reynolds@golder.com	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): J. England	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: (10) 5 Days Standard or __ Day(s)

PWS I.D. #:

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Hexavalent Chromium (7196)							
1) MW-11	G		N			8/24/2020	1240	1240	GW	1	X							
2)																		
3)																		
4)																		
5)																		
6)																		
7)					MT													
8)																		
9)																		
10)																		

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

* all bottles preserved on ice *

Reporting Group A: MW-11 BKG

RELINQUISHED: John England	DATE / TIME 8/24/2020 1410	RECEIVED: J. Lh	DATE / TIME 8/24/2020 2:20
RELINQUISHED:	DATE / TIME 8/24/2020 3:47	RECEIVED:	DATE / TIME 8/24/20 1547
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 271 COOLER TEMP 6.0 °C
Custody Seals used and intact? (Y)/ N) Received on ice? (Y)/ N)

GA **20H1169**
BPS: North East and West Ponds S
Recd: 08/24/2020 Due: 09/08/2020

v130325002

F1331 AWS COC v181115.xls

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil"), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/27/2020 4:21:06PM

Sample Conditions Checklist

Samples Received at:	**6.00°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

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

September 28, 2020

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

RE: Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on August 25, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville
- Pace Analytical Services - Eden
- Pace Analytical Services - Greensburg

This revision was issued on 9/28/20 to update reporting units, per client request.

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

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, LLC.

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

CERTIFICATIONS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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
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

Pace Analytical Services Asheville
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 Eden
205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738
North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

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SAMPLE SUMMARY

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492358001	**MW-29S**	Water	08/25/20 10:10	08/25/20 15:28
92492358002	**MW-29D**	Water	08/25/20 11:05	08/25/20 15:28

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492358001	**MW-29S**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	KQ	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	KDF1	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492358002	**MW-29D**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	KQ	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	KDF1	1	PASI-A
		EPA 9056A	CDC	4	PASI-A

PASI-A = Pace Analytical Services - Asheville
PASI-E = Pace Analytical Services - Eden
PASI-PA = Pace Analytical Services - Greensburg

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492358001	**MW-29S**					
SM 2540C-2011	Total Dissolved Solids	196	mg/L	25.0	08/27/20 09:45	
EPA 6010D	Arsenic	5.7J	ug/L	10.0	08/31/20 08:35	
EPA 6010D	Barium	40.4	ug/L	5.0	08/31/20 08:35	
EPA 6010D	Calcium	16000	ug/L	100	08/31/20 08:35	
EPA 6010D	Hardness, Total(SM 2340B)	53300	ug/L	662	08/31/20 08:35	
EPA 6020B	Cobalt	0.28	ug/L	0.10	08/31/20 22:53	
EPA 6020B	Iron	268	ug/L	50.0	08/31/20 22:53	
EPA 6020B	Lithium	0.56J	ug/L	2.5	08/31/20 22:53	
EPA 6020B	Manganese	99.2	ug/L	0.50	08/31/20 22:53	
EPA 9315	Radium-226	0.219 ± 0.156 (0.274) C:86% T:NA	pCi/L		09/08/20 18:05	
EPA 9320	Radium-228	0.992 ± 0.468 (0.789) C:70% T:79%	pCi/L		09/11/20 11:45	
Total Radium Calculation	Total Radium	1.21 ± 0.624 (1.06)	pCi/L		09/14/20 14:03	
EPA 9056A	Chloride	27.7	mg/L	1.0	08/26/20 12:49	
EPA 9056A	Nitrate as N	4.7	mg/L	0.10	08/26/20 12:49	
EPA 9056A	Sulfate	27.2	mg/L	1.0	08/26/20 12:49	
92492358002	**MW-29D**					
SM 2540C-2011	Total Dissolved Solids	492	mg/L	50.0	08/27/20 09:45	
EPA 6010D	Arsenic	6.6J	ug/L	10.0	08/31/20 08:38	
EPA 6010D	Barium	39.6	ug/L	5.0	08/31/20 08:38	
EPA 6010D	Boron	46.8J	ug/L	50.0	08/31/20 08:38	
EPA 6010D	Calcium	44400	ug/L	100	08/31/20 08:38	
EPA 6010D	Molybdenum	7.8	ug/L	5.0	08/31/20 08:38	
EPA 6010D	Hardness, Total(SM 2340B)	156000	ug/L	662	08/31/20 08:38	
EPA 6020B	Cobalt	0.26	ug/L	0.10	08/31/20 22:56	
EPA 6020B	Iron	926	ug/L	50.0	08/31/20 22:56	
EPA 6020B	Lead	0.19	ug/L	0.10	08/31/20 22:56	
EPA 6020B	Lithium	1.6J	ug/L	2.5	08/31/20 22:56	
EPA 6020B	Manganese	1300	ug/L	12.5	09/01/20 12:21	
EPA 6020B	Tin	0.65	ug/L	0.50	08/31/20 22:56	
EPA 9315	Radium-226	0.676 ± 0.194 (0.220) C:93% T:NA	pCi/L		09/08/20 18:05	
EPA 9320	Radium-228	1.27 ± 0.515 (0.788) C:68% T:74%	pCi/L		09/11/20 11:45	
Total Radium Calculation	Total Radium	1.95 ± 0.709 (1.01)	pCi/L		09/14/20 14:03	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492358002	**MW-29D**					
EPA 350.1 Rev 2.0 1993	Nitrogen, Ammonia	0.094J	mg/L	0.10	09/02/20 10:50	
EPA 9056A	Chloride	39.5	mg/L	1.0	08/26/20 13:16	
EPA 9056A	Fluoride	0.12	mg/L	0.10	08/26/20 13:16	
EPA 9056A	Sulfate	73.4	mg/L	1.0	08/26/20 13:16	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29S **Lab ID: 92492358001** Collected: 08/25/20 10:10 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**196**	mg/L	25.0	25.0	1		08/27/20 09:45		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/29/20 02:01	08/31/20 08:35	7440-36-0	
Arsenic	**5.7J**	ug/L	10.0	4.7	1	08/29/20 02:01	08/31/20 08:35	7440-38-2	
Barium	**40.4**	ug/L	5.0	3.5	1	08/29/20 02:01	08/31/20 08:35	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/29/20 02:01	08/31/20 08:35	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/29/20 02:01	08/31/20 08:35	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/29/20 02:01	08/31/20 08:35	7440-43-9	
Calcium	**16000**	ug/L	100	94.2	1	08/29/20 02:01	08/31/20 08:35	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/29/20 02:01	08/31/20 08:35	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/29/20 02:01	08/31/20 08:35	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/29/20 02:01	08/31/20 08:35	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/29/20 02:01	08/31/20 08:35	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/29/20 02:01	08/31/20 08:35	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/29/20 02:01	08/31/20 08:35	7440-22-4	
Hardness, Total(SM 2340B)	**53300**	ug/L	662	131	1	08/29/20 02:01	08/31/20 08:35		
Vanadium	ND	ug/L	5.0	3.9	1	08/29/20 02:01	08/31/20 08:35	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/29/20 02:01	08/31/20 08:35	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.28**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:53	7440-48-4	
Iron	**268**	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 22:53	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 22:53	7439-92-1	
Lithium	**0.56J**	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 22:53	7439-93-2	
Manganese	**99.2**	ug/L	0.50	0.47	1	08/28/20 01:18	08/31/20 22:53	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:53	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 22:53	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/02/20 16:40	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		08/31/20 12:48	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**27.7**	mg/L	1.0	0.60	1		08/26/20 12:49	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 12:49	16984-48-8	
Nitrate as N	**4.7**	mg/L	0.10	0.060	1		08/26/20 12:49	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29S **Lab ID: 92492358001** Collected: 08/25/20 10:10 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**27.2**	mg/L	1.0	0.50	1		08/26/20 12:49	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29D **Lab ID: 92492358002** Collected: 08/25/20 11:05 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**492**	mg/L	50.0	50.0	1		08/27/20 09:45		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/29/20 02:01	08/31/20 08:38	7440-36-0	
Arsenic	**6.6J**	ug/L	10.0	4.7	1	08/29/20 02:01	08/31/20 08:38	7440-38-2	
Barium	**39.6**	ug/L	5.0	3.5	1	08/29/20 02:01	08/31/20 08:38	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/29/20 02:01	08/31/20 08:38	7440-41-7	
Boron	**46.8J**	ug/L	50.0	32.4	1	08/29/20 02:01	08/31/20 08:38	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/29/20 02:01	08/31/20 08:38	7440-43-9	
Calcium	**44400**	ug/L	100	94.2	1	08/29/20 02:01	08/31/20 08:38	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/29/20 02:01	08/31/20 08:38	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/29/20 02:01	08/31/20 08:38	7440-50-8	
Molybdenum	**7.8**	ug/L	5.0	3.9	1	08/29/20 02:01	08/31/20 08:38	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/29/20 02:01	08/31/20 08:38	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/29/20 02:01	08/31/20 08:38	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/29/20 02:01	08/31/20 08:38	7440-22-4	
Hardness, Total(SM 2340B)	**156000**	ug/L	662	131	1	08/29/20 02:01	08/31/20 08:38		
Vanadium	ND	ug/L	5.0	3.9	1	08/29/20 02:01	08/31/20 08:38	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/29/20 02:01	08/31/20 08:38	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.26**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:56	7440-48-4	
Iron	**926**	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 22:56	7439-89-6	
Lead	**0.19**	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 22:56	7439-92-1	
Lithium	**1.6J**	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 22:56	7439-93-2	
Manganese	**1300**	ug/L	12.5	11.8	25	08/28/20 01:18	09/01/20 12:21	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:56	7440-28-0	
Tin	**0.65**	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 22:56	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/02/20 16:42	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	**0.094J**	mg/L	0.10	0.070	1		09/02/20 10:50	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**39.5**	mg/L	1.0	0.60	1		08/26/20 13:16	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	0.050	1		08/26/20 13:16	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 13:16	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29D **Lab ID: 92492358002** Collected: 08/25/20 11:05 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**73.4**	mg/L	1.0	0.50	1		08/26/20 13:16	14808-79-8	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 562744
QC Batch Method: SM 2540C-2011
Analysis Method: SM 2540C-2011
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 2984270 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/27/20 09:38	

LABORATORY CONTROL SAMPLE: 2984271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2984272

Parameter	Units	92492617001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	347	336	3	25	

SAMPLE DUPLICATE: 2984273

Parameter	Units	92492363002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	408	5	25	

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.

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 563477
QC Batch Method: EPA 7470A
Analysis Method: EPA 7470A
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 2987706 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.12	09/02/20 16:23	

LABORATORY CONTROL SAMPLE: 2987707

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2987708 2987709

Parameter	Units	92492605003 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	2.4	2.4	93	93	75-125	0	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 563240
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 2986672 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.0	08/31/20 08:28	
Arsenic	ug/L	ND	10.0	4.7	08/31/20 08:28	
Barium	ug/L	ND	5.0	3.5	08/31/20 08:28	
Beryllium	ug/L	ND	1.0	0.70	08/31/20 08:28	
Boron	ug/L	ND	50.0	32.4	08/31/20 08:28	
Cadmium	ug/L	ND	1.0	0.40	08/31/20 08:28	
Calcium	ug/L	ND	100	94.2	08/31/20 08:28	
Chromium	ug/L	ND	5.0	3.7	08/31/20 08:28	
Copper	ug/L	ND	5.0	4.3	08/31/20 08:28	
Hardness, Total(SM 2340B)	ug/L	ND	662	131	08/31/20 08:28	
Molybdenum	ug/L	ND	5.0	3.9	08/31/20 08:28	
Nickel	ug/L	ND	5.0	3.5	08/31/20 08:28	
Selenium	ug/L	ND	10.0	4.7	08/31/20 08:28	
Silver	ug/L	ND	5.0	2.5	08/31/20 08:28	
Vanadium	ug/L	ND	5.0	3.9	08/31/20 08:28	
Zinc	ug/L	ND	10.0	9.5	08/31/20 08:28	

LABORATORY CONTROL SAMPLE: 2986673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	464	93	80-120	
Arsenic	ug/L	500	474	95	80-120	
Barium	ug/L	500	500	100	80-120	
Beryllium	ug/L	500	497	99	80-120	
Boron	ug/L	500	502	100	80-120	
Cadmium	ug/L	500	492	98	80-120	
Calcium	ug/L	5000	4670	93	80-120	
Chromium	ug/L	500	496	99	80-120	
Copper	ug/L	500	489	98	80-120	
Hardness, Total(SM 2340B)	ug/L	33100	31300	95	80-120	
Molybdenum	ug/L	500	494	99	80-120	
Nickel	ug/L	500	501	100	80-120	
Selenium	ug/L	500	475	95	80-120	
Silver	ug/L	250	243	97	80-120	
Vanadium	ug/L	500	505	101	80-120	
Zinc	ug/L	500	496	99	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986674 2986675

Parameter	Units	92492605003 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	497	501	99	100	75-125	1	20	
Arsenic	ug/L	13.1	500	500	521	522	102	102	75-125	0	20	
Barium	ug/L	265	500	500	796	787	106	104	75-125	1	20	
Beryllium	ug/L	ND	500	500	520	512	104	102	75-125	1	20	
Boron	ug/L	2.5 mg/L	500	500	3170	3120	129	119	75-125	2	20	M1
Cadmium	ug/L	ND	500	500	529	524	106	105	75-125	1	20	
Calcium	ug/L	126 mg/L	5000	5000	136000	129000	196	71	75-125	5	20	M1
Chromium	ug/L	ND	500	500	521	509	104	102	75-125	2	20	
Copper	ug/L	ND	500	500	521	520	104	104	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	456000	33100	33100	505000	485000	149	87	75-125	4		
Molybdenum	ug/L	131	500	500	661	653	106	104	75-125	1	20	
Nickel	ug/L	ND	500	500	511	504	102	101	75-125	1	20	
Selenium	ug/L	ND	500	500	528	523	106	105	75-125	1	20	
Silver	ug/L	ND	250	250	259	255	104	102	75-125	1	20	
Vanadium	ug/L	ND	500	500	534	526	107	105	75-125	2	20	
Zinc	ug/L	ND	500	500	511	497	102	99	75-125	3	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	08/31/20 22:26	
Iron	ug/L	ND	50.0	20.9	08/31/20 22:26	
Lead	ug/L	ND	0.10	0.077	08/31/20 22:26	
Lithium	ug/L	ND	2.5	0.39	08/31/20 22:26	
Manganese	ug/L	ND	0.50	0.47	08/31/20 22:26	
Thallium	ug/L	ND	0.10	0.050	08/31/20 22:26	
Tin	ug/L	ND	0.50	0.24	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	
Iron	ug/L	625	660	106	80-120	
Lead	ug/L	50	49.8	100	80-120	
Lithium	ug/L	50	47.3	95	80-120	
Manganese	ug/L	50	51.8	104	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	50.5	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	61.9	10	10	76.5	73.6	146	118	75-125	4	20	M6
Iron	ug/L	17300	625	625	18700	18300	229	157	75-125	2	20	M6
Lead	ug/L	ND	50	50	49.2	50.3	98	101	75-125	2	20	
Lithium	ug/L	2.8	50	50	46.9	46.5	88	87	75-125	1	20	
Manganese	ug/L	3530	50	50	3800	3680	537	298	75-125	3	20	M6
Thallium	ug/L	ND	10	10	10	10.2	100	102	75-125	2	20	
Tin	ug/L	ND	50	50	50.5	51.0	101	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 563330
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358001

METHOD BLANK: 2986901 Matrix: Water
Associated Lab Samples: 92492358001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	08/31/20 12:06	

LABORATORY CONTROL SAMPLE: 2986902

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.8	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986903 2986904

Parameter	Units	92492840002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.22	5	5	5.2	5.2	99	99	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986905 2986906

Parameter	Units	92492843001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.52	5	5	5.2	5.2	94	94	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 563643
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358002

METHOD BLANK: 2988301 Matrix: Water
Associated Lab Samples: 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/02/20 10:31	

LABORATORY CONTROL SAMPLE: 2988302

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2988303 2988304

Parameter	Units	92492988001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	0.70	5	5	5.8	5.8	102	103	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2988305 2988306

Parameter	Units	92492988002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	11.1	5	5	16.1	16.1	100	99	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 562469
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 2983027 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/26/20 12:09	
Fluoride	mg/L	ND	0.10	0.050	08/26/20 12:09	
Nitrate as N	mg/L	ND	0.10	0.060	08/26/20 12:09	
Sulfate	mg/L	ND	1.0	0.50	08/26/20 12:09	

LABORATORY CONTROL SAMPLE: 2983028

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.7	95	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Nitrate as N	mg/L	2.5	2.3	92	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2983029 2983030

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.0	50	50	80.6	81.6	95	97	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.8	2.9	111	113	90-110	2	10	M1
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	97	98	90-110	1	10	
Sulfate	mg/L	42.1	50	50	90.9	91.6	98	99	90-110	1	10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29S **Lab ID: 92492358001** Collected: 08/25/20 10:10 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.219 ± 0.156 (0.274) C:86% T:NA**	pCi/L	09/08/20 18:05	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.992 ± 0.468 (0.789) C:70% T:79%**	pCi/L	09/11/20 11:45	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.21 ± 0.624 (1.06)**	pCi/L	09/14/20 14:03	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Sample: MW-29D **Lab ID: 92492358002** Collected: 08/25/20 11:05 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.676 ± 0.194 (0.220) C:93% T:NA**	pCi/L	09/08/20 18:05	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**1.27 ± 0.515 (0.788) C:68% T:74%**	pCi/L	09/11/20 11:45	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.95 ± 0.709 (1.01)**	pCi/L	09/14/20 14:03	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 412359
QC Batch Method: EPA 9315
Analysis Method: EPA 9315
Analysis Description: 9315 Total Radium
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 1994519 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0753 ± 0.0856 (0.159) C:96% T:NA	pCi/L	09/08/20 17:44	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

QC Batch: 411839
QC Batch Method: EPA 9320
Analysis Method: EPA 9320
Analysis Description: 9320 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492358001, 92492358002

METHOD BLANK: 1992208 Matrix: Water
Associated Lab Samples: 92492358001, 92492358002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.627 ± 0.369 (0.668) C:69% T:83%	pCi/L	09/11/20 11:43	

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QUALIFIERS

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

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 (%)

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TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (B)-Revised Report
Pace Project No.: 92492358

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492358001	**MW-29S**	SM 2540C-2011	562744		
92492358002	**MW-29D**	SM 2540C-2011	562744		
92492358001	**MW-29S**	EPA 3010A	563240	EPA 6010D	563251
92492358002	**MW-29D**	EPA 3010A	563240	EPA 6010D	563251
92492358001	**MW-29S**	EPA 3010A	562977	EPA 6020B	562996
92492358002	**MW-29D**	EPA 3010A	562977	EPA 6020B	562996
92492358001	**MW-29S**	EPA 7470A	563477	EPA 7470A	563586
92492358002	**MW-29D**	EPA 7470A	563477	EPA 7470A	563586
92492358001	**MW-29S**	EPA 9315	412359		
92492358002	**MW-29D**	EPA 9315	412359		
92492358001	**MW-29S**	EPA 9320	411839		
92492358002	**MW-29D**	EPA 9320	411839		
92492358001	**MW-29S**	Total Radium Calculation	413734		
92492358002	**MW-29D**	Total Radium Calculation	413734		
92492358001	**MW-29S**	EPA 350.1 Rev 2.0 1993	563330		
92492358002	**MW-29D**	EPA 350.1 Rev 2.0 1993	563643		
92492358001	**MW-29S**	EPA 9056A	562469		
92492358002	**MW-29D**	EPA 9056A	562469		

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CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder Label

WO# : 92492358

92492358

ALL SHADED

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): M. Taylor ~~/ C. Joyner~~ MT	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Taylor	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply) / Field Filtered (if applicable): [ ] Yes [X] No / Analysis: _____

Container Preservative Type

1	1	U	U	1	2	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 _____ (O1) Other 1 _____

* 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)

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	Analyses: 6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228			Lab Sample # / Comments:
MW-29S	GW	G	8/25/2020	1010			N	7	X	X	X	X	X	X	X	X			*all bottles preserved on ice* 001
MW-29D	GW	G	8/25/2020	1105			N	7	X	X	X	X	X	X	X	X			002

MT

Lab Profile/Line:

Lab Sample Receipt Checklist:
- Custody Seals Present/Intact ✓ N NA
- Custody Signatures Present ✓ N NA
- Collector Signature Present ✓ N NA
- Bottles Intact ✓ N NA
- Correct Bottles ✓ N NA
- Sufficient Volume ✓ N NA
- Samples Received on Ice ✓ N NA
- VOA - Headspace Acceptable Y N ~~NA~~
- USDA Regulated Soils Y N ~~NA~~
- Samples in Holding Time ✓ N NA
- Residual Chlorine Present Y ~~N~~ NA
- Cl Strips: 0205
- Sample pH Acceptable ✓ NNA
- pH Strips: 232518V
- Sulfide Present Y N ~~NA~~
- Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492358

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group B for more details. MW 29S & MW 29D BKG

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 3.8 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.8 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Taylor (Golder)	8/25/2020 1405	Paul Love	8/25/20 1405
Paul Love	8/25/20 1528	Rachel Burruss	8-25-20 1528

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: 1 of: 1

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, VA 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Analysis Detects Report

Date Issued:

Client Name:

Client Site ID:

Submitted To:

Laboratory Sample ID: **Client Sample ID:**

Parameter	Samp ID	Reference Method	Sample Results	Qual	DL	LOQ	Dil. Factor	Units

There are no reportable results for target analytes in this report.

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

AIR WATER & SOIL
an Enthalpy Analytical Laboratory
1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 20H1257

Client Name:	Golder Associates, Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	Date Received:	August 25, 2020 16:05
		Date Issued:	August 31, 2020 10:26
		Project Number:	20139823
Submitted To:	Amanda Reynolds	Purchase Order:	
Client Site I.D.:	Bremo Power Station		

Enclosed are the results of analyses for samples received by the laboratory on 08/25/2020 16:05. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars
Technical Director

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Air Water & Soil Laboratories, Inc.

ACCREDITED IN ACCORDANCE WITH nelac
Commonwealth of Virginia, DCLS
Accreditation # 460021

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/31/2020 10:26:03AM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW -29 S	20H1257-01	Ground Water	08/25/2020 10:10	08/25/2020 16:05
MW -29 D	20H1257-02	Ground Water	08/25/2020 11:05	08/25/2020 16:05

Report re-issued to include corrected analysis time.

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 8/31/2020 10:26:03AM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW -29 S** **Laboratory Sample ID:** **20H1257-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/31/2020 10:26:03AM

Client Sample ID: **MW -29 D** **Laboratory Sample ID:** **20H1257-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	02	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 8/31/2020 10:26:03AM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Wet Chemistry Analysis - Quality Control

Air Water & Soil Laboratories, Inc.

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BDH0881 - No Prep Wet Chem										
Blank (BDH0881-BLK1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0881-BS1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100		102	80-120			
Matrix Spike (BDH0881-MS1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100	BLOD	102	80-120			
Matrix Spike Dup (BDH0881-MSD1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	99	5	ug/L	100	BLOD	99.0	80-120	2.99	20	

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
20H1257-01	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1257-02	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/31/2020 10:26:03AM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Certified Analyses included in this Report

Analyte	Certifications
SW7196A in Non-Potable Water	
Chromium, Hexavalent	VELAP

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2020
NC	North Carolina DENR	495	12/31/2020
NJDEP	New Jersey DEP	VA015	06/30/2021
NYDOH	New York DOH Drinking Water	12096	04/01/2021
PADEP	NELAC-Pennsylvania Certificate #005	68-03503	10/31/2020
VELAP	NELAC-Virginia Certificate #10886	460021	06/14/2021
WVDEP	West Virginia DEP	350	11/30/2020

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Date Issued: 8/31/2020 10:26:03AM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Qualifiers and Definitions

U	Analyte was not detected and is reported as less than the DL or as defined by the client. The DL has been adjusted for any dilution or concentration of the sample.
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

AIR WATER & SOIL LABORATORIES, INC.

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3Q20 Hexavalent Chromium
CONTACT: A. Reynolds, M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: areynolds@golder.com, martha_smith@golder.com	Pretreatment Program:

Is sample for compliance reporting? (YES) NO | **Regulatory State:** VA | Is sample from a chlorinated supply? YES (NO) | PWS I.D. #:

SAMPLER NAME (PRINT): M. Taylor | SAMPLER SIGNATURE: M. Taylor | **Turn Around Time:** Circle: (10) 5 Days (standard) or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE): Hexavalent Chromium (7196) (ice)							
1) MW-29S	X		N			8/25/2020	1010	1010	GW	1	X							
2) MW-29D	X		N			8/25/2020	1105	1105	GW	1	X							
3)																		
4)																		
5)																		
6)																		
7)																		
8)					MT													
9)																		
10)																		

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

* all bottles preserved on ice *

Reporting Group B = MW-29S & MW-29D BKG

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
M. Taylor	8/25/2020 1405	Paul Love	8/25/20 1405
Paul Love	8/25/20 1605	[signature]	8/25/20 1605

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 271 COOLER TEMP 2.5 °C
Custody Seals used and intact? (Y)/ N) Received on ice? (Y) N)

GA 20H1257
BPS: North East and West Ponds S
Recd: 08/25/2020 Due: 09/09/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from those methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/31/2020 10:26:03AM

Sample Conditions Checklist

Samples Received at:	**2.50°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

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

September 28, 2020

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

RE: Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory between August 25, 2020 and August 27, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville
- Pace Analytical Services - Eden
- Pace Analytical Services - Greensburg

This revision was issued on 9/23/20 to remove the out of hold nitrate data, per client request.

This second revision was issued on 9/28/20 to update reporting units, per client request.

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

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CERTIFICATIONS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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
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

Pace Analytical Services Asheville
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 Eden
205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738
North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

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SAMPLE SUMMARY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492363001	**MW-35**	Water	08/24/20 16:30	08/25/20 15:28
92492363002	**MW-24**	Water	08/25/20 12:30	08/25/20 15:28
92492363003	**MW-27D**	Water	08/25/20 15:48	08/26/20 15:45
92492363004	**MW-34**	Water	08/25/20 15:20	08/26/20 15:45
92492363005	**MW-33**	Water	08/25/20 16:37	08/26/20 15:45
92492363006	**NP-Duplicate**	Water	08/25/20 16:10	08/26/20 15:45
92492363007	**MW-33**	Water	08/27/20 10:00	08/27/20 15:25
92492363008	**MW-34**	Water	08/27/20 09:53	08/27/20 15:25

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492363001	**MW-35**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492363002	**MW-24**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492363003	**MW-27D**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A
92492363004	**MW-34**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	3	PASI-A
92492363005	**MW-33**	SM 2540C-2011	SOB	1	PASI-E

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	3	PASI-A
92492363006	**NP-Duplicate**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A
92492363007	**MW-33**	EPA 9056A	CDC	1	PASI-A
92492363008	**MW-34**	EPA 9056A	CDC	1	PASI-A

PASI-A = Pace Analytical Services - Asheville
PASI-E = Pace Analytical Services - Eden
PASI-PA = Pace Analytical Services - Greensburg

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492363001	**MW-35**					
SM 2540C-2011	Total Dissolved Solids	300	mg/L	25.0	08/27/20 09:44	
EPA 6010D	Barium	127	ug/L	5.0	09/01/20 04:45	
EPA 6010D	Boron	533	ug/L	50.0	09/01/20 04:45	
EPA 6010D	Calcium	58000	ug/L	100	09/01/20 04:45	
EPA 6010D	Hardness, Total(SM 2340B)	184000	ug/L	662	09/01/20 04:45	
EPA 6020B	Cobalt	0.65	ug/L	0.10	09/01/20 01:50	
EPA 6020B	Iron	4060	ug/L	1500	09/01/20 12:41	
EPA 6020B	Lithium	13.4	ug/L	2.5	09/01/20 01:50	
EPA 6020B	Manganese	1730	ug/L	15.0	09/01/20 12:41	
EPA 9315	Radium-226	1.53 ± 0.557 (0.526) C:67% T:NA	pCi/L		09/10/20 07:35	
EPA 9320	Radium-228	0.354 ± 0.448 (0.954) C:67% T:87%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	1.88 ± 1.01 (1.48)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	10	mg/L	1.0	08/26/20 12:36	
EPA 9056A	Sulfate	35.5	mg/L	1.0	08/26/20 12:36	
92492363002	**MW-24**					
SM 2540C-2011	Total Dissolved Solids	428	mg/L	50.0	08/27/20 09:48	
EPA 6010D	Arsenic	7.7J	ug/L	10.0	09/01/20 04:49	
EPA 6010D	Barium	98.5	ug/L	5.0	09/01/20 04:49	
EPA 6010D	Boron	205	ug/L	50.0	09/01/20 04:49	
EPA 6010D	Calcium	70300	ug/L	100	09/01/20 04:49	M1
EPA 6010D	Molybdenum	9.3	ug/L	5.0	09/01/20 04:49	
EPA 6010D	Selenium	5.3J	ug/L	10.0	09/01/20 04:49	
EPA 6010D	Hardness, Total(SM 2340B)	222000	ug/L	662	09/01/20 04:49	
EPA 6020B	Cobalt	61.9	ug/L	5.0	09/01/20 12:52	M6
EPA 6020B	Iron	17300	ug/L	2500	09/01/20 12:52	M6
EPA 6020B	Lithium	2.8	ug/L	2.5	09/01/20 01:53	
EPA 6020B	Manganese	3530	ug/L	25.0	09/01/20 12:52	M6
EPA 9315	Radium-226	1.48 ± 0.535 (0.544) C:76% T:NA	pCi/L		09/10/20 07:35	
EPA 9320	Radium-228	2.17 ± 0.715 (0.978) C:72% T:77%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	3.65 ± 1.25 (1.52)	pCi/L		09/16/20 09:19	
EPA 350.1 Rev 2.0 1993	Nitrogen, Ammonia	1.3	mg/L	0.10	09/05/20 12:43	
EPA 9056A	Chloride	33.0	mg/L	1.0	08/26/20 13:43	
EPA 9056A	Sulfate	42.1	mg/L	1.0	08/26/20 13:43	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492363003	**MW-27D**					
SM 2540C-2011	Total Dissolved Solids	860	mg/L	50.0	08/31/20 10:31	
EPA 6010D	Barium	33.2	ug/L	5.0	09/01/20 05:08	
EPA 6010D	Boron	1330	ug/L	50.0	09/01/20 05:08	
EPA 6010D	Calcium	69100	ug/L	100	09/01/20 05:08	
EPA 6010D	Molybdenum	16.8	ug/L	5.0	09/01/20 05:08	
EPA 6010D	Hardness, Total(SM 2340B)	286000	ug/L	662	09/01/20 05:08	
EPA 6020B	Cobalt	0.37	ug/L	0.10	09/01/20 02:24	
EPA 6020B	Iron	557	ug/L	50.0	09/01/20 02:24	
EPA 6020B	Lead	0.11	ug/L	0.10	09/01/20 02:24	
EPA 6020B	Lithium	45.1	ug/L	2.5	09/01/20 02:24	
EPA 6020B	Manganese	244	ug/L	2.5	09/01/20 12:56	
EPA 6020B	Tin	0.69	ug/L	0.50	09/01/20 02:24	
EPA 9315	Radium-226	-0.0657 ± 0.0970 (0.386) C:86% T:NA	pCi/L		09/10/20 07:35	
EPA 9320	Radium-228	0.243 ± 0.375 (0.812) C:74% T:86%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	0.243 ± 0.472 (1.20)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	13.6	mg/L	1.0	08/27/20 13:09	
EPA 9056A	Fluoride	0.15	mg/L	0.10	08/27/20 13:09	
EPA 9056A	Nitrate as N	0.20	mg/L	0.10	08/27/20 13:09	
EPA 9056A	Sulfate	264	mg/L	6.0	08/27/20 14:25	
92492363004	**MW-34**					
SM 2540C-2011	Total Dissolved Solids	255	mg/L	25.0	08/31/20 10:31	
EPA 6010D	Barium	41.9	ug/L	5.0	09/01/20 05:11	
EPA 6010D	Boron	1240	ug/L	50.0	09/01/20 05:11	
EPA 6010D	Calcium	35500	ug/L	100	09/01/20 05:11	
EPA 6010D	Hardness, Total(SM 2340B)	144000	ug/L	662	09/01/20 05:11	
EPA 6020B	Lithium	5.9	ug/L	2.5	09/10/20 00:12	
EPA 6020B	Manganese	5.0	ug/L	0.50	09/10/20 00:12	
EPA 7470A	Mercury	0.32	ug/L	0.20	09/01/20 15:43	
EPA 9315	Radium-226	0.456 ± 0.345 (0.622) C:80% T:NA	pCi/L		09/10/20 07:36	
EPA 9320	Radium-228	0.0165 ± 0.359 (0.832) C:75% T:86%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	0.473 ± 0.704 (1.45)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	12.9	mg/L	1.0	08/28/20 13:03	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492363004	**MW-34**					
EPA 9056A	Fluoride	0.12	mg/L	0.10	08/28/20 13:03	
EPA 9056A	Sulfate	33.3	mg/L	1.0	08/28/20 13:03	
92492363005	**MW-33**					
SM 2540C-2011	Total Dissolved Solids	373	mg/L	25.0	08/31/20 10:32	
EPA 6010D	Barium	21.3	ug/L	5.0	09/01/20 05:15	
EPA 6010D	Boron	256	ug/L	50.0	09/01/20 05:15	
EPA 6010D	Calcium	78000	ug/L	100	09/01/20 05:15	
EPA 6010D	Copper	4.5J	ug/L	5.0	09/01/20 05:15	
EPA 6010D	Molybdenum	6.3	ug/L	5.0	09/01/20 05:15	
EPA 6010D	Nickel	4.7J	ug/L	5.0	09/01/20 05:15	
EPA 6010D	Silver	4.7J	ug/L	5.0	09/01/20 05:15	
EPA 6010D	Hardness, Total(SM 2340B)	257000	ug/L	662	09/01/20 05:15	
EPA 6010D	Zinc	24.2	ug/L	10.0	09/01/20 05:15	
EPA 6020B	Cobalt	0.18	ug/L	0.10	09/08/20 22:59	
EPA 6020B	Iron	247	ug/L	50.0	09/08/20 22:59	
EPA 6020B	Lead	0.15	ug/L	0.10	09/08/20 22:59	
EPA 6020B	Lithium	4.7	ug/L	2.5	09/08/20 00:19	
EPA 6020B	Manganese	56.2	ug/L	0.50	09/08/20 00:19	
EPA 6020B	Tin	0.75	ug/L	0.50	09/08/20 22:59	
EPA 9315	Radium-226	0.273 ± 0.239 (0.419) C:79% T:NA	pCi/L		09/10/20 07:36	
EPA 9320	Radium-228	-0.169 ± 0.428 (1.02) C:67% T:84%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	0.273 ± 0.667 (1.44)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	22.6	mg/L	1.0	08/28/20 13:17	
EPA 9056A	Fluoride	0.085J	mg/L	0.10	08/28/20 13:17	
EPA 9056A	Sulfate	45.1	mg/L	1.0	08/28/20 13:17	
92492363006	**NP-Duplicate**					
SM 2540C-2011	Total Dissolved Solids	892	mg/L	50.0	08/31/20 10:32	
EPA 6010D	Barium	29.3	ug/L	5.0	09/01/20 05:24	
EPA 6010D	Boron	1320	ug/L	50.0	09/01/20 05:24	
EPA 6010D	Calcium	67600	ug/L	100	09/01/20 05:24	
EPA 6010D	Molybdenum	16.1	ug/L	5.0	09/01/20 05:24	
EPA 6010D	Hardness, Total(SM 2340B)	280000	ug/L	662	09/01/20 05:24	
EPA 6020B	Cobalt	0.19	ug/L	0.10	09/01/20 13:00	
EPA 6020B	Iron	339	ug/L	50.0	09/01/20 13:00	
EPA 6020B	Lithium	51.1	ug/L	2.5	09/01/20 13:00	
EPA 6020B	Manganese	179	ug/L	2.5	09/02/20 00:49	
EPA 6020B	Tin	0.53	ug/L	0.50	09/01/20 13:00	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492363006	**NP-Duplicate**					
EPA 9315	Radium-226	0.589 ± 0.336 (0.500) C:87% T:NA	pCi/L		09/10/20 07:36	
EPA 9320	Radium-228	0.372 ± 0.446 (0.945) C:70% T:83%	pCi/L		09/15/20 14:38	
Total Radium Calculation	Total Radium	0.961 ± 0.782 (1.45)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	13.6	mg/L	1.0	08/27/20 13:22	
EPA 9056A	Fluoride	0.16	mg/L	0.10	08/27/20 13:22	
EPA 9056A	Sulfate	261	mg/L	6.0	08/27/20 14:39	
92492363007	**MW-33**					
EPA 9056A	Nitrate as N	0.68	mg/L	0.10	08/28/20 14:11	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-35 **Lab ID: 92492363001** Collected: 08/24/20 16:30 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**300**	mg/L	25.0	25.0	1		08/27/20 09:44		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:45	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:45	7440-38-2	
Barium	**127**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:45	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:45	7440-41-7	
Boron	**533**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:45	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:45	7440-43-9	
Calcium	**58000**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:45	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:45	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:45	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:45	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:45	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:45	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:45	7440-22-4	
Hardness, Total(SM 2340B)	**184000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:45		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:45	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:45	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.65**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 01:50	7440-48-4	
Iron	**4060**	ug/L	1500	628	30	08/28/20 01:18	09/01/20 12:41	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 01:50	7439-92-1	
Lithium	**13.4**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 01:50	7439-93-2	
Manganese	**1730**	ug/L	15.0	14.2	30	08/28/20 01:18	09/01/20 12:41	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 01:50	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 01:50	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:21	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 12:42	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**10**	mg/L	1.0	0.60	1		08/26/20 12:36	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 12:36	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 12:36	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-35 **Lab ID: 92492363001** Collected: 08/24/20 16:30 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**35.5**	mg/L	1.0	0.50	1		08/26/20 12:36	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-24 **Lab ID: 92492363002** Collected: 08/25/20 12:30 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**428**	mg/L	50.0	50.0	1		08/27/20 09:48		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:49	7440-36-0	
Arsenic	**7.7J**	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:49	7440-38-2	
Barium	**98.5**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:49	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:49	7440-41-7	
Boron	**205**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:49	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:49	7440-43-9	
Calcium	**70300**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:49	7440-70-2	M1
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:49	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:49	7440-50-8	
Molybdenum	**9.3**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:49	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:49	7440-02-0	
Selenium	**5.3J**	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:49	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:49	7440-22-4	
Hardness, Total(SM 2340B)	**222000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:49		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:49	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:49	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**61.9**	ug/L	5.0	2.5	50	08/28/20 01:18	09/01/20 12:52	7440-48-4	M6
Iron	**17300**	ug/L	2500	1050	50	08/28/20 01:18	09/01/20 12:52	7439-89-6	M6
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 01:53	7439-92-1	
Lithium	**2.8**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 01:53	7439-93-2	
Manganese	**3530**	ug/L	25.0	23.6	50	08/28/20 01:18	09/01/20 12:52	7439-96-5	M6
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 01:53	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 01:53	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:24	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	**1.3**	mg/L	0.10	0.070	1		09/05/20 12:43	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**33.0**	mg/L	1.0	0.60	1		08/26/20 13:43	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 13:43	16984-48-8	M1
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 13:43	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-24 **Lab ID: 92492363002** Collected: 08/25/20 12:30 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**42.1**	mg/L	1.0	0.50	1		08/26/20 13:43	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-27D **Lab ID: 92492363003** Collected: 08/25/20 15:48 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**860**	mg/L	50.0	50.0	1		08/31/20 10:31		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:08	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:08	7440-38-2	
Barium	**33.2**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:08	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:08	7440-41-7	
Boron	**1330**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:08	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:08	7440-43-9	
Calcium	**69100**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 05:08	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:08	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:08	7440-50-8	
Molybdenum	**16.8**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:08	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:08	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:08	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:08	7440-22-4	
Hardness, Total(SM 2340B)	**286000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 05:08		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:08	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:08	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.37**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:24	7440-48-4	
Iron	**557**	ug/L	50.0	20.9	1	08/28/20 01:18	09/01/20 02:24	7439-89-6	
Lead	**0.11**	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 02:24	7439-92-1	
Lithium	**45.1**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 02:24	7439-93-2	
Manganese	**244**	ug/L	2.5	2.4	5	08/28/20 01:18	09/01/20 12:56	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:24	7440-28-0	
Tin	**0.69**	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 02:24	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:40	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 12:51	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.6**	mg/L	1.0	0.60	1		08/27/20 13:09	16887-00-6	
Fluoride	**0.15**	mg/L	0.10	0.050	1		08/27/20 13:09	16984-48-8	
Nitrate as N	**0.20**	mg/L	0.10	0.060	1		08/27/20 13:09	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-27D **Lab ID: 92492363003** Collected: 08/25/20 15:48 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**264**	mg/L	6.0	3.0	6		08/27/20 14:25	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-34 **Lab ID: 92492363004** Collected: 08/25/20 15:20 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**255**	mg/L	25.0	25.0	1		08/31/20 10:31		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:11	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:11	7440-38-2	
Barium	**41.9**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:11	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:11	7440-41-7	
Boron	**1240**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:11	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:11	7440-43-9	
Calcium	**35500**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 05:11	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:11	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:11	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:11	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:11	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:11	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:11	7440-22-4	
Hardness, Total(SM 2340B)	**144000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 05:11		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:11	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:11	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	ND	ug/L	0.10	0.050	1	09/09/20 16:11	09/10/20 00:12	7440-48-4	
Iron	ND	ug/L	50.0	20.9	1	09/09/20 16:11	09/10/20 00:12	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	09/09/20 16:11	09/10/20 00:12	7439-92-1	
Lithium	**5.9**	ug/L	2.5	0.39	1	09/09/20 16:11	09/10/20 00:12	7439-93-2	
Manganese	**5.0**	ug/L	0.50	0.47	1	09/09/20 16:11	09/10/20 00:12	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	09/09/20 16:11	09/10/20 00:12	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	09/09/20 16:11	09/10/20 00:12	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	**0.32**	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:43	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 12:52	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**12.9**	mg/L	1.0	0.60	1		08/28/20 13:03	16887-00-6	
Fluoride	**0.12**	mg/L	0.10	0.050	1		08/28/20 13:03	16984-48-8	
Sulfate	**33.3**	mg/L	1.0	0.50	1		08/28/20 13:03	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-33 **Lab ID: 92492363005** Collected: 08/25/20 16:37 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**373**	mg/L	25.0	25.0	1		08/31/20 10:32		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:15	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:15	7440-38-2	
Barium	**21.3**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:15	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:15	7440-41-7	
Boron	**256**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:15	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:15	7440-43-9	
Calcium	**78000**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 05:15	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:15	7440-47-3	
Copper	**4.5J**	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:15	7440-50-8	
Molybdenum	**6.3**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:15	7439-98-7	
Nickel	**4.7J**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:15	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:15	7782-49-2	
Silver	**4.7J**	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:15	7440-22-4	
Hardness, Total(SM 2340B)	**257000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 05:15		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:15	7440-62-2	
Zinc	**24.2**	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:15	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.18**	ug/L	0.10	0.050	1	09/04/20 01:11	09/08/20 22:59	7440-48-4	
Iron	**247**	ug/L	50.0	20.9	1	09/04/20 01:11	09/08/20 22:59	7439-89-6	
Lead	**0.15**	ug/L	0.10	0.077	1	09/04/20 01:11	09/08/20 22:59	7439-92-1	
Lithium	**4.7**	ug/L	2.5	0.39	1	09/04/20 01:11	09/08/20 00:19	7439-93-2	
Manganese	**56.2**	ug/L	0.50	0.47	1	09/04/20 01:11	09/08/20 00:19	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	09/04/20 01:11	09/08/20 22:59	7440-28-0	
Tin	**0.75**	ug/L	0.50	0.24	1	09/04/20 01:11	09/08/20 22:59	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:45	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/09/20 11:30	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**22.6**	mg/L	1.0	0.60	1		08/28/20 13:17	16887-00-6	
Fluoride	**0.085J**	mg/L	0.10	0.050	1		08/28/20 13:17	16984-48-8	
Sulfate	**45.1**	mg/L	1.0	0.50	1		08/28/20 13:17	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: NP-Duplicate **Lab ID: 92492363006** Collected: 08/25/20 16:10 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**892**	mg/L	50.0	50.0	1		08/31/20 10:32		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:24	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:24	7440-38-2	
Barium	**29.3**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:24	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:24	7440-41-7	
Boron	**1320**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:24	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:24	7440-43-9	
Calcium	**67600**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 05:24	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:24	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:24	7440-50-8	
Molybdenum	**16.1**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:24	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:24	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:24	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:24	7440-22-4	
Hardness, Total(SM 2340B)	**280000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 05:24		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:24	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:24	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.19**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 13:00	7440-48-4	
Iron	**339**	ug/L	50.0	20.9	1	08/28/20 01:18	09/01/20 13:00	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 13:00	7439-92-1	
Lithium	**51.1**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 13:00	7439-93-2	
Manganese	**179**	ug/L	2.5	2.4	5	08/28/20 01:18	09/02/20 00:49	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 13:00	7440-28-0	
Tin	**0.53**	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 13:00	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:47	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/09/20 11:31	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.6**	mg/L	1.0	0.60	1		08/27/20 13:22	16887-00-6	
Fluoride	**0.16**	mg/L	0.10	0.050	1		08/27/20 13:22	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/27/20 13:22	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: NP-Duplicate **Lab ID: 92492363006** Collected: 08/25/20 16:10 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**261**	mg/L	6.0	3.0	6		08/27/20 14:39	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-33 **Lab ID: 92492363007** Collected: 08/27/20 10:00 Received: 08/27/20 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Nitrate as N	**0.68**	mg/L	0.10	0.060	1		08/28/20 14:11	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-34 **Lab ID: 92492363008** Collected: 08/27/20 09:53 Received: 08/27/20 15:25 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Nitrate as N	ND	mg/L	0.10	0.060	1		08/28/20 13:57	14797-55-8	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 562744
QC Batch Method: SM 2540C-2011
Analysis Method: SM 2540C-2011
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492363001, 92492363002

METHOD BLANK: 2984270 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/27/20 09:38	

LABORATORY CONTROL SAMPLE: 2984271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2984272

Parameter	Units	92492617001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	347	336	3	25	

SAMPLE DUPLICATE: 2984273

Parameter	Units	92492363002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	408	5	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 563387 | Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492363003, 92492363004, 92492363005, 92492363006

METHOD BLANK: 2987203 Matrix: Water
Associated Lab Samples: 92492363003, 92492363004, 92492363005, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/31/20 10:31	

LABORATORY CONTROL SAMPLE: 2987204

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 2987205

Parameter	Units	92492605003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	570	552	3	25	

SAMPLE DUPLICATE: 2987206

Parameter	Units	92492846001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	56.0	54.0	4	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 563522 | Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

METHOD BLANK: 2987909 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.12	09/01/20 14:41	

LABORATORY CONTROL SAMPLE: 2987910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2987911 2987912

Parameter	Units	92492846001 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	2.4	2.4	96	97	75-125	1	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2987913 2987914

Parameter	Units	92492363002 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	2.2	2.3	85	90	75-125	6	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 563337
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

METHOD BLANK: 2986933 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.0	09/01/20 03:34	
Arsenic	ug/L	ND	10.0	4.7	09/01/20 03:34	
Barium	ug/L	ND	5.0	3.5	09/01/20 03:34	
Beryllium	ug/L	ND	1.0	0.70	09/01/20 03:34	
Boron	ug/L	ND	50.0	32.4	09/01/20 03:34	
Cadmium	ug/L	ND	1.0	0.40	09/01/20 03:34	
Calcium	ug/L	ND	100	94.2	09/01/20 03:34	
Chromium	ug/L	ND	5.0	3.7	09/01/20 03:34	
Copper	ug/L	ND	5.0	4.3	09/01/20 03:34	
Hardness, Total(SM 2340B)	ug/L	ND	662	131	09/01/20 03:34	
Molybdenum	ug/L	ND	5.0	3.9	09/01/20 03:34	
Nickel	ug/L	ND	5.0	3.5	09/01/20 03:34	
Selenium	ug/L	ND	10.0	4.7	09/01/20 03:34	
Silver	ug/L	ND	5.0	2.5	09/01/20 03:34	
Vanadium	ug/L	ND	5.0	3.9	09/01/20 03:34	
Zinc	ug/L	ND	10.0	9.5	09/01/20 03:34	

LABORATORY CONTROL SAMPLE: 2986934

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	505	101	80-120	
Arsenic	ug/L	500	507	101	80-120	
Barium	ug/L	500	511	102	80-120	
Beryllium	ug/L	500	519	104	80-120	
Boron	ug/L	500	494	99	80-120	
Cadmium	ug/L	500	506	101	80-120	
Calcium	ug/L	5000	5040	101	80-120	
Chromium	ug/L	500	506	101	80-120	
Copper	ug/L	500	517	103	80-120	
Hardness, Total(SM 2340B)	ug/L	33100	33100	100	80-120	
Molybdenum	ug/L	500	516	103	80-120	
Nickel	ug/L	500	511	102	80-120	
Selenium	ug/L	500	500	100	80-120	
Silver	ug/L	250	251	100	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	492	98	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986935 2986936

Parameter	Units	92492846001 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	513	511	103	102	75-125	0	20	
Arsenic	ug/L	ND	500	500	531	536	106	107	75-125	1	20	
Barium	ug/L	14.4	500	500	534	531	104	103	75-125	1	20	
Beryllium	ug/L	ND	500	500	532	528	106	106	75-125	1	20	
Boron	ug/L	ND	500	500	526	525	104	104	75-125	0	20	
Cadmium	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Calcium	ug/L	2.9 mg/L	5000	5000	8130	8110	104	104	75-125	0	20	
Chromium	ug/L	ND	500	500	521	525	104	105	75-125	1	20	
Copper	ug/L	ND	500	500	524	523	104	104	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	15800	33100	33100	50000	50100	103	104	75-125	0		
Molybdenum	ug/L	ND	500	500	526	524	105	105	75-125	1	20	
Nickel	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Selenium	ug/L	ND	500	500	535	538	107	107	75-125	1	20	
Silver	ug/L	ND	250	250	258	258	103	103	75-125	0	20	
Vanadium	ug/L	ND	500	500	516	520	103	104	75-125	1	20	
Zinc	ug/L	ND	500	500	527	531	105	106	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986937 2986938

Parameter	Units	92492363002 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	518	515	104	103	75-125	1	20	
Arsenic	ug/L	7.7J	500	500	543	538	107	106	75-125	1	20	
Barium	ug/L	98.5	500	500	614	605	103	101	75-125	1	20	
Beryllium	ug/L	ND	500	500	531	518	106	104	75-125	3	20	
Boron	ug/L	205	500	500	735	727	106	104	75-125	1	20	
Cadmium	ug/L	ND	500	500	524	515	105	103	75-125	2	20	
Calcium	ug/L	70300	5000	5000	74400	73200	82	56	75-125	2	20	M1
Chromium	ug/L	ND	500	500	512	498	102	100	75-125	3	20	
Copper	ug/L	ND	500	500	530	528	106	105	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	222000	33100	33100	252000	248000	93	80	75-125	2		
Molybdenum	ug/L	9.3	500	500	540	530	106	104	75-125	2	20	
Nickel	ug/L	ND	500	500	511	500	102	100	75-125	2	20	
Selenium	ug/L	5.3J	500	500	532	533	105	106	75-125	0	20	
Silver	ug/L	ND	250	250	258	253	103	101	75-125	2	20	
Vanadium	ug/L	ND	500	500	523	508	105	102	75-125	3	20	
Zinc	ug/L	ND	500	500	518	501	103	100	75-125	3	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363006

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	08/31/20 22:26	
Iron	ug/L	ND	50.0	20.9	08/31/20 22:26	
Lead	ug/L	ND	0.10	0.077	08/31/20 22:26	
Lithium	ug/L	ND	2.5	0.39	08/31/20 22:26	
Manganese	ug/L	ND	0.50	0.47	08/31/20 22:26	
Thallium	ug/L	ND	0.10	0.050	08/31/20 22:26	
Tin	ug/L	ND	0.50	0.24	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	
Iron	ug/L	625	660	106	80-120	
Lead	ug/L	50	49.8	100	80-120	
Lithium	ug/L	50	47.3	95	80-120	
Manganese	ug/L	50	51.8	104	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	50.5	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	61.9	10	10	76.5	73.6	146	118	75-125	4	20	M6
Iron	ug/L	17300	625	625	18700	18300	229	157	75-125	2	20	M6
Lead	ug/L	ND	50	50	49.2	50.3	98	101	75-125	2	20	
Lithium	ug/L	2.8	50	50	46.9	46.5	88	87	75-125	1	20	
Manganese	ug/L	3530	50	50	3800	3680	537	298	75-125	3	20	M6
Thallium	ug/L	ND	10	10	10	10.2	100	102	75-125	2	20	
Tin	ug/L	ND	50	50	50.5	51.0	101	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 564489
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363005

METHOD BLANK: 2992327 Matrix: Water
Associated Lab Samples: 92492363005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	09/08/20 22:37	
Iron	ug/L	ND	50.0	20.9	09/08/20 22:37	
Lead	ug/L	ND	0.10	0.077	09/08/20 22:37	
Lithium	ug/L	ND	2.5	0.39	09/08/20 00:11	
Manganese	ug/L	ND	0.50	0.47	09/08/20 00:11	
Thallium	ug/L	ND	0.10	0.050	09/08/20 22:37	
Tin	ug/L	ND	0.50	0.24	09/08/20 22:37	

LABORATORY CONTROL SAMPLE: 2992328

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.0	100	80-120	
Iron	ug/L	625	635	102	80-120	
Lead	ug/L	50	51.3	103	80-120	
Lithium	ug/L	50	51.8	104	80-120	
Manganese	ug/L	50	51.9	104	80-120	
Thallium	ug/L	10	10.2	102	80-120	
Tin	ug/L	50	50.7	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2992329 2992330

Parameter	Units	92493443006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	0.15	10	10	10.3	10.2	102	100	75-125	1	20	
Iron	ug/L	16500	625	625	18700	23200	355	1060	75-125	21	20	M6,R1
Lead	ug/L	ND	50	50	51.6	51.8	103	103	75-125	0	20	
Lithium	ug/L	16.6	50	50	66.8	67.1	100	101	75-125	0	20	
Manganese	ug/L	1120	50	50	1280	1580	324	920	75-125	21	20	BC, M6,R1
Thallium	ug/L	ND	10	10	10.4	10.5	104	105	75-125	1	20	
Tin	ug/L	0.72	50	50	52.1	50.8	103	100	75-125	3	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 565305
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363004

METHOD BLANK: 2995907 Matrix: Water
Associated Lab Samples: 92492363004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	09/09/20 23:38	
Iron	ug/L	ND	50.0	20.9	09/09/20 23:38	
Lead	ug/L	ND	0.10	0.077	09/09/20 23:38	
Lithium	ug/L	ND	2.5	0.39	09/09/20 23:38	
Manganese	ug/L	ND	0.50	0.47	09/09/20 23:38	
Thallium	ug/L	ND	0.10	0.050	09/09/20 23:38	
Tin	ug/L	ND	0.50	0.24	09/09/20 23:38	

LABORATORY CONTROL SAMPLE: 2995908

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.2	102	80-120	
Iron	ug/L	625	648	104	80-120	
Lead	ug/L	50	50.3	101	80-120	
Lithium	ug/L	50	47.2	94	80-120	
Manganese	ug/L	50	50.8	102	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	49.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2995909 2995910

Parameter	Units	92493784002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	8.2	10	10	18.4	18.7	102	105	75-125	2	20	
Iron	ug/L	3230	625	625	4360	4440	181	194	75-125	2	20	M6
Lead	ug/L	ND	50	50	51.3	51.1	103	102	75-125	0	20	
Lithium	ug/L	3.1	50	50	47.3	47.5	88	89	75-125	0	20	
Manganese	ug/L	209	50	50	292	297	168	177	75-125	2	20	M6
Thallium	ug/L	ND	10	10	10.2	10.2	101	102	75-125	0	20	
Tin	ug/L	ND	50	50	50.4	49.7	101	99	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2995911 2995912

Parameter	Units	92493444008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	44.0	10	10	52.1	50.0	81	60	75-125	4	20	M6

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2995911 2995912

Parameter	Units	92493444008 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Iron	ug/L	6430	625	625	6730	6390	47	-7	75-125	5	20	M6
Lead	ug/L	0.15	50	50	51.0	50.5	102	101	75-125	1	20	
Lithium	ug/L	14.7	50	50	55.9	55.5	82	82	75-125	1	20	
Manganese	ug/L	983	50	50	962	924	-42	-117	75-125	4	20	M6
Thallium	ug/L	ND	10	10	10.2	10.1	102	101	75-125	1	20	
Tin	ug/L	ND	50	50	48.7	48.5	97	97	75-125	0	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 564677 | Analysis Method: EPA 350.1 Rev 2.0 1993
QC Batch Method: EPA 350.1 Rev 2.0 1993 | Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004

METHOD BLANK: 2993041 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/05/20 12:09	

LABORATORY CONTROL SAMPLE: 2993042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993043 2993044

Parameter	Units	92493679001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	1.1	5	5	6.0	6.0	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993045 2993046

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	1.3	5	5	6.2	6.2	99	99	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 564936
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363005, 92492363006

METHOD BLANK: 2994458 Matrix: Water
Associated Lab Samples: 92492363005, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/09/20 11:12	

LABORATORY CONTROL SAMPLE: 2994459

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	100	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2994460 2994461

Parameter	Units	92494144001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.9	4.9	97	97	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2994462 2994463

Parameter	Units	92494153001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	17.4	5	5	22.4	23.3	99	117	90-110	4	10	M1

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 562469
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363001, 92492363002

METHOD BLANK: 2983027 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/26/20 12:09	
Fluoride	mg/L	ND	0.10	0.050	08/26/20 12:09	
Nitrate as N	mg/L	ND	0.10	0.060	08/26/20 12:09	
Sulfate	mg/L	ND	1.0	0.50	08/26/20 12:09	

LABORATORY CONTROL SAMPLE: 2983028

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.7	95	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Nitrate as N	mg/L	2.5	2.3	92	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2983029 2983030

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.0	50	50	80.6	81.6	95	97	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.8	2.9	111	113	90-110	2	10	M1
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	97	98	90-110	1	10	
Sulfate	mg/L	42.1	50	50	90.9	91.6	98	99	90-110	1	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 562799
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363003, 92492363006

METHOD BLANK: 2984477 Matrix: Water
Associated Lab Samples: 92492363003, 92492363006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/27/20 12:28	
Fluoride	mg/L	ND	0.10	0.050	08/27/20 12:28	
Nitrate as N	mg/L	ND	0.10	0.060	08/27/20 12:28	
Sulfate	mg/L	ND	1.0	0.50	08/27/20 12:28	

LABORATORY CONTROL SAMPLE: 2984478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.0	98	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Nitrate as N	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	50	49.4	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2984479 2984480

Parameter	Units	92492605003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.5	50	50	56.0	56.6	99	100	90-110	1	10	
Fluoride	mg/L	0.14	2.5	2.5	2.7	2.7	101	104	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.5	2.5	98	100	90-110	2	10	
Sulfate	mg/L	71.0	50	50	109	109	75	77	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2984481 2984482

Parameter	Units	92492605007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.5	50	50	55.8	56.7	99	100	90-110	2	10	
Fluoride	mg/L	0.060J	2.5	2.5	2.7	2.8	105	108	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	97	99	90-110	2	10	
Sulfate	mg/L	60.7	50	50	91.2	99.8	61	78	90-110	9	10	M1

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 563062
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492363004, 92492363005, 92492363007, 92492363008

METHOD BLANK: 2985765 Matrix: Water
Associated Lab Samples: 92492363004, 92492363005, 92492363007, 92492363008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/28/20 11:12	
Fluoride	mg/L	ND	0.10	0.050	08/28/20 11:12	
Nitrate as N	mg/L	ND	0.10	0.060	08/28/20 11:12	
Sulfate	mg/L	ND	1.0	0.50	08/28/20 11:12	

LABORATORY CONTROL SAMPLE: 2985766

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	48.0	96	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Nitrate as N	mg/L	2.5	2.3	92	90-110	
Sulfate	mg/L	50	48.3	97	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985767 2985768

Parameter	Units	92492846001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	2.5	50	50	52.3	53.1	100	101	90-110	2	10	
Fluoride	mg/L	0.093J	2.5	2.5	3.7	3.9	146	153	90-110	5	10	M1
Nitrate as N	mg/L	0.079J	2.5	2.5	2.6	2.6	100	102	90-110	2	10	
Sulfate	mg/L	3.0	50	50	54.7	55.5	103	105	90-110	2	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985769 2985770

Parameter	Units	92492844003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	35.5	50	50	84.5	85.5	98	100	90-110	1	10	
Fluoride	mg/L	0.13	2.5	2.5	2.8	2.9	109	112	90-110	3	10	M1
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	98	100	90-110	2	10	
Sulfate	mg/L	54.8	50	50	93.8	94.6	78	80	90-110	1	10	M1

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-35 **Lab ID: 92492363001** Collected: 08/24/20 16:30 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**1.53 ± 0.557 (0.526) C:67% T:NA**	pCi/L	09/10/20 07:35	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.354 ± 0.448 (0.954) C:67% T:87%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.88 ± 1.01 (1.48)**	pCi/L	09/16/20 09:19	7440-14-4	

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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-24 **Lab ID: 92492363002** Collected: 08/25/20 12:30 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**1.48 ± 0.535 (0.544) C:76% T:NA**	pCi/L	09/10/20 07:35	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**2.17 ± 0.715 (0.978) C:72% T:77%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**3.65 ± 1.25 (1.52)**	pCi/L	09/16/20 09:19	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-27D **Lab ID: 92492363003** Collected: 08/25/20 15:48 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**-0.0657 ± 0.0970 (0.386) C:86% T:NA**	pCi/L	09/10/20 07:35	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.243 ± 0.375 (0.812) C:74% T:86%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.243 ± 0.472 (1.20)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-34 **Lab ID: 92492363004** Collected: 08/25/20 15:20 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.456 ± 0.345 (0.622) C:80% T:NA**	pCi/L	09/10/20 07:36	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.0165 ± 0.359 (0.832) C:75% T:86%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.473 ± 0.704 (1.45)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: MW-33 **Lab ID: 92492363005** Collected: 08/25/20 16:37 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.273 ± 0.239 (0.419) C:79% T:NA**	pCi/L	09/10/20 07:36	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**-0.169 ± 0.428 (1.02) C:67% T:84%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.273 ± 0.667 (1.44)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Sample: NP-Duplicate **Lab ID: 92492363006** Collected: 08/25/20 16:10 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.589 ± 0.336 (0.500) C:87% T:NA**	pCi/L	09/10/20 07:36	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.372 ± 0.446 (0.945) C:70% T:83%**	pCi/L	09/15/20 14:38	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.961 ± 0.782 (1.45)**	pCi/L	09/16/20 09:19	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 412342 | Analysis Method: EPA 9320
QC Batch Method: EPA 9320 | Analysis Description: 9320 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

METHOD BLANK: 1994498 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.550 ± 0.369 (0.698) C:73% T:85%	pCi/L	09/15/20 14:39	

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 2SA20 (C)-Revised Report
Pace Project No.: 92492363

QC Batch: 412351 | Analysis Method: EPA 9315
QC Batch Method: EPA 9315 | Analysis Description: 9315 Total Radium
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

METHOD BLANK: 1994513 Matrix: Water
Associated Lab Samples: 92492363001, 92492363002, 92492363003, 92492363004, 92492363005, 92492363006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0558 ± 0.230 (0.577) C:80% T:NA	pCi/L	09/10/20 07:35	

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 2SA20 (C)-Revised Report
Pace Project No.: 92492363

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.

ANALYTE QUALIFIERS

BC	The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the laboratory reporting limit.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492363001	**MW-35**	SM 2540C-2011	562744		
92492363002	**MW-24**	SM 2540C-2011	562744		
92492363003	**MW-27D**	SM 2540C-2011	563387		
92492363004	**MW-34**	SM 2540C-2011	563387		
92492363005	**MW-33**	SM 2540C-2011	563387		
92492363006	**NP-Duplicate**	SM 2540C-2011	563387		
92492363001	**MW-35**	EPA 3010A	563337	EPA 6010D	563346
92492363002	**MW-24**	EPA 3010A	563337	EPA 6010D	563346
92492363003	**MW-27D**	EPA 3010A	563337	EPA 6010D	563346
92492363004	**MW-34**	EPA 3010A	563337	EPA 6010D	563346
92492363005	**MW-33**	EPA 3010A	563337	EPA 6010D	563346
92492363006	**NP-Duplicate**	EPA 3010A	563337	EPA 6010D	563346
92492363001	**MW-35**	EPA 3010A	562977	EPA 6020B	562996
92492363002	**MW-24**	EPA 3010A	562977	EPA 6020B	562996
92492363003	**MW-27D**	EPA 3010A	562977	EPA 6020B	562996
92492363004	**MW-34**	EPA 3010A	565305	EPA 6020B	565362
92492363005	**MW-33**	EPA 3010A	564489	EPA 6020B	564506
92492363006	**NP-Duplicate**	EPA 3010A	562977	EPA 6020B	562996
92492363001	**MW-35**	EPA 7470A	563522	EPA 7470A	563588
92492363002	**MW-24**	EPA 7470A	563522	EPA 7470A	563588
92492363003	**MW-27D**	EPA 7470A	563522	EPA 7470A	563588
92492363004	**MW-34**	EPA 7470A	563522	EPA 7470A	563588
92492363005	**MW-33**	EPA 7470A	563522	EPA 7470A	563588
92492363006	**NP-Duplicate**	EPA 7470A	563522	EPA 7470A	563588
92492363001	**MW-35**	EPA 9315	412351		
92492363002	**MW-24**	EPA 9315	412351		
92492363003	**MW-27D**	EPA 9315	412351		
92492363004	**MW-34**	EPA 9315	412351		
92492363005	**MW-33**	EPA 9315	412351		
92492363006	**NP-Duplicate**	EPA 9315	412351		
92492363001	**MW-35**	EPA 9320	412342		
92492363002	**MW-24**	EPA 9320	412342		
92492363003	**MW-27D**	EPA 9320	412342		
92492363004	**MW-34**	EPA 9320	412342		
92492363005	**MW-33**	EPA 9320	412342		
92492363006	**NP-Duplicate**	EPA 9320	412342		
92492363001	**MW-35**	Total Radium Calculation	414065		
92492363002	**MW-24**	Total Radium Calculation	414065		
92492363003	**MW-27D**	Total Radium Calculation	414065		
92492363004	**MW-34**	Total Radium Calculation	414065		
92492363005	**MW-33**	Total Radium Calculation	414065		
92492363006	**NP-Duplicate**	Total Radium Calculation	414065		
92492363001	**MW-35**	EPA 350.1 Rev 2.0 1993	564677		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (C)-Revised Report
Pace Project No.: 92492363

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492363002	**MW-24**	EPA 350.1 Rev 2.0 1993	564677		
92492363003	**MW-27D**	EPA 350.1 Rev 2.0 1993	564677		
92492363004	**MW-34**	EPA 350.1 Rev 2.0 1993	564677		
92492363005	**MW-33**	EPA 350.1 Rev 2.0 1993	564936		
92492363006	**NP-Duplicate**	EPA 350.1 Rev 2.0 1993	564936		
92492363001	**MW-35**	EPA 9056A	562469		
92492363002	**MW-24**	EPA 9056A	562469		
92492363003	**MW-27D**	EPA 9056A	562799		
92492363004	**MW-34**	EPA 9056A	563062		
92492363005	**MW-33**	EPA 9056A	563062		
92492363006	**NP-Duplicate**	EPA 9056A	562799		
92492363007	**MW-33**	EPA 9056A	563062		
92492363008	**MW-34**	EPA 9056A	563062		

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CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Worl

WO# : 92492363

ALL SHAD

92492363

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #:
Collected By (signature): John Graytland / M Taylor	Turnaround Date Required: Standard
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply)

Compliance Monitoring? [X] Yes [ ] No

DW PWS ID #:

DW Location Code:

Immediately Packed on Ice: [X] Yes [ ] No

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

1	1	U	U	1	2	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 _____ (O1) Other 1 _____

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228		
MW-35	GW	G	8/24/2020	1630			N	7	X	X	X	X	X	X	X	X		
MW-24	GW	G	~~8/24/2020~~ 8/25/2020	1230		MT	N	17	X	X	X	X	X	X	X	X		

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ✓ N NA
Custody Signatures Present ✓ N NA
Collector Signature Present ✓ N NA
Bottles Intact ✓ N NA
Correct Bottles ✓ N NA
Sufficient Volume ✓ N NA
Samples Received on Ice ✓ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ✓ N NA
Residual Chlorine Present Y ✓ NA
Cl Strips: 0205
Sample pH Acceptable ✓ NNA
pH Strips: 232518V
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492363

* all bottles preserved on 001 ice * 002

MS/MSD sampled here

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group C for more details. North Pond Compliance

North Pond MS/MSD @ MW-24

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 3.8 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.8 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Taylor (Golder)	8/25/2020 1405	Paul Love	8/25/20 1405
Paul Love	8/25/20 1528	Rachel Burruss	8-25-20 1528

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: 1 of: 1

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CHAIN-OF-CUSTODY Analytical Request Document

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LAB USE ONLY- Affix Wor

WO# : 92492363

PM: NMG Due Date: 09/18/20

CLIENT: 92-Golder

ALL SHAD

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Taylor	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U	U	1	2	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 _____ (O1) Other 1 _____

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228
MW-27D	GW	G	8/25/2020	1548			N	7	X	X	X	X	X	X	X	X
MW-~~33~~ MT 34	GW	G	8/25/2020	1520			N	7	X	X	X	X	X	X	X	X
MW-~~34~~ MT 33	GW	G	8/25/2020	~~1520~~ 1637 MT			N	7	X	X	X	X	X	X	X	X
NP- Duplicate	GW	G	8/25/2020	1610		MT	N	7	X	X	X	X	X	X	X	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
Cl Strips: 0205
Sample pH Acceptable Y N NA
pH Strips: 232518V
Sulfide Present Y N NA
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492363

* all bottles preserved on ice *	003
	004
	005
	006

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group C North Pond Compliance for more details.

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 4.3 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 4.3 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Taylor / Golder	8/26/2020 1405	Charlie Trent	8/26 1405
Charlie Trent 3:45	8/26	Rachel Burruss	8-26-20 1545

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: 1 of: 1

Pace Analytical®

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix W

WO# : 92492363

PM: NMG Due Date: 09/18/20

CLIENT: 92-Golder

ALL SHA

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Taylor / C. Joyner	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U	U	1	2	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 _____ (O1) Other 1 _____

Lab Project Manager:

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Time	Composite End Date	Time	Res Cl	# of Ctns	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate) MT Nitrate	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228	9056 - Nitrate MT		Lab Profile/Line:
MW-33	GW	G	8/25/2020	1637			N	7	X	X	X	X	X	X	X	X			92492363 (005)
MW-33	GW	G	8/27/2020	1000			N	1			X								* Nitrate ONLY * 007
MW-34	GW	G	8/25/2020	1520		MT	N	7	X	X	X	X	X	X	X	X			(004)
MW-34	GW	G	8/27/2020	0953			N	1			X								* Nitrate ONLY * 008
																			* all bottles preserved on ice *

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	✓	N	NA
Custody Signatures Present	✓	N	NA
Collector Signature Present	✓	N	NA
Bottles Intact	✓	N	NA
Correct Bottles	✓	N	NA
Sufficient Volume	✓	N	NA
Samples Received on Ice	✓	N	NA
VOA - Headspace Acceptable	Y	N	✓
USDA Regulated Soils	Y	N	✓
Samples in Holding Time	✓	N	NA
Residual Chlorine Present	Y	✓	NA
Cl Strips: 0205			
Sample pH Acceptable	✓	N	NA
pH Strips: 232518V			
Sulfide Present	Y	N	✓
Lead Acetate Strips:			

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group C for more details. North Pond Compliance

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 2.7 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 2.7 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Golder	8-27-2020 1700	Paul Love	8/27/20 1400
Paul Love	8/27/20 1525	Rachel Burruss	8-27-20 1525

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: 1 of: 1

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Analysis Detects Report

Client Name: Golder Associates, Inc.
Client Site ID: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 9/9/2020 2:39:36PM

Laboratory Sample ID: **20H1256-01** **Client Sample ID:** **MW-24**

Parameter	Samp ID	Reference Method	Sample Results	Qual	DL	LOQ	Dil. Factor	Units
Chromium, Hexavalent	01	SW7196A	7		5	5	1	ug/L

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

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Certificate of Analysis

Final Report

Sample Delivery Group ID Bremo C 200825

Client Name:	Golder Associates, Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	Date Issued:	9/9/2020 2:39:36PM
Submitted To:	Amanda Reynolds		
Client Site I.D.:	Bremo Power Station	Purchase Order:	

Enclosed are the results of analyses for samples received by the laboratory in sample delivery group Bremo C 200825 . Work orders included in the sample delivery group:

Work Order	Receive Date	Project Number
20H1183	8/25/2020 10:00:00AM	20139823
20H1256	8/25/2020 4:05:00PM	20139823
20H1289	8/26/2020 10:28:00AM	20139823

Ted Soyars

Technical Director

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Air Water & Soil Laboratories, Inc.

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 9/9/2020 2:39:36PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-35	20H1183-01	Ground Water	08/24/2020 16:30	08/25/2020 10:00
MW-24	20H1256-01	Ground Water	08/25/2020 12:30	08/25/2020 16:05
MW-27D	20H1289-01	Ground Water	08/25/2020 15:48	08/26/2020 10:28
Duplicate- NAP	20H1289-02	Ground Water	08/25/2020 16:10	08/26/2020 10:28
MW-34	20H1289-03	Ground Water	08/25/2020 15:20	08/26/2020 10:28
MW-33	20H1289-04	Ground Water	08/25/2020 16:37	08/26/2020 10:28

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-35** **Laboratory Sample ID:** **20H1183-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/25/2020 10:30	08/25/2020 11:00	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-24** **Laboratory Sample ID:** **20H1256-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	7		5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-27D** **Laboratory Sample ID:** **20H1289-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/26/2020 10:30	08/26/2020 10:30	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **Duplicate- NAP** **Laboratory Sample ID:** **20H1289-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	02	18540-29-9	SW7196A	08/26/2020 10:30	08/26/2020 10:30	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-34** **Laboratory Sample ID:** **20H1289-03**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	03	18540-29-9	SW7196A	08/26/2020 10:30	08/26/2020 10:30	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-33** **Laboratory Sample ID:** **20H1289-04**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	04	18540-29-9	SW7196A	08/26/2020 10:30	08/26/2020 10:30	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Wet Chemistry Analysis - Quality Control

Air Water & Soil Laboratories, Inc.

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BDH0793 - No Prep Wet Chem										
Blank (BDH0793-BLK1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0793-BS1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	105	5	ug/L	100		105	80-120			
Matrix Spike (BDH0793-MS1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	96	5	ug/L	100	BLOD	96.0	80-120			
Matrix Spike Dup (BDH0793-MSD1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	97	5	ug/L	100	BLOD	97.0	80-120	1.04	20	
Batch BDH0881 - No Prep Wet Chem										
Blank (BDH0881-BLK1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0881-BS1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100		102	80-120			
Matrix Spike (BDH0881-MS1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100	BLOD	102	80-120			
Matrix Spike Dup (BDH0881-MSD1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	99	5	ug/L	100	BLOD	99.0	80-120	2.99	20	

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:39:36PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
20H1183-01	100 mL / 100 mL	SW7196A	BDH0793	SDH0707	AH00108
20H1256-01	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1289-01	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1289-02	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1289-03	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1289-04	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Certified Analyses included in this Report

Analyte	Certifications
SW7196A in Non-Potable Water	
Chromium, Hexavalent	VELAP

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2020
NC	North Carolina DENR	495	12/31/2020
NJDEP	New Jersey DEP	VA015	06/30/2021
NYDOH	New York DOH Drinking Water	12096	04/01/2021
PADEP	NELAC-Pennsylvania Certificate #005	68-03503	10/31/2020
VELAP	NELAC-Virginia Certificate #10886	460021	06/14/2021
WVDEP	West Virginia DEP	350	11/30/2020

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Qualifiers and Definitions

U	Analyte was not detected and is reported as less than the DL or as defined by the client. The DL has been adjusted for any dilution or concentration of the sample.
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

AIR WATER & SOIL LABORATORIES, INC.
1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3920 Hexavalent Chrom
CONTACT: A. Reynolds, M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: amanda_reynolds@golder.com	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): J. England ~~M. Taylor~~ MT	SAMPLER SIGNATURE: John England	**Turn Around Time:** Circle: (10) 5 Days Standard or __ Day(s)

PWS I.D. #:

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE): Hexavalent Chromium (7196) Ice)							
1) MW-35	X		N			8/24/2020	1630	1630	GW	1	X							
2)																		
3)																		
4)																		
5)					MT													
6)																		
7)																		
8)																		
9)																		
10)																		

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

all bottles preserved on ice

Reporting Group C North Pond

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
M. Jaynes	8/25/2020 0835	Cat Rupp	8/25/2020 0835
Cate Rupp	8/25/2020 10:00		8/24/20 1000
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 271 COOLER TEMP 1.1 °C
Custody Seals used and intact? (Y / N) Received on ice? (Y / N)

GA 20H1183
BPS: North East and West Ponds S
Recd: 08/25/2020 Due: 09/09/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples: 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

AIR WATER & SOIL LABORATORIES, INC.

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3020 Hexavalent Chromium
CONTACT: A. Reynolds, M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: areynolds@golder.com, martha_smith@golder.com	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): M. Taylor	SAMPLER SIGNATURE: M. Taylor	**Turn Around Time:** Circle: (10) 5 Days Standard or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Hexavalent Chromium (7196) Cice)								COMMENTS
1) MW-24	X		N			8/25/2020	1230	1230	GW	1	X								
2)																			
3)																			
4)																			
5)					NT														Reporting Group C- North Pond
6)																			
7)																			
8)																			
9)																			
10)																			

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
M. Taylor	8/25/2020 1405	Paul Love	8/25/20 1405
Paul Love	8/25/20 1605	CC	8/25/20 1605

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 221 COOLER TEMP 2.1 °C
Custody Seals used and intact? (Y)/ N) Received on ice? (Y)/ N)

GA 20H1256
BPS: North East and West Ponds S
Recd: 08/25/2020 Due: 09/09/2020

v130325002

F1331 AWS COC_v181115.xls

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

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4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

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5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

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5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

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6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

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8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision; term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

AIR WATER & SOIL LABORATORIES, INC.
1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3020 Hexavalent Chromium
CONTACT: A. Reynolds, M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: areynolds@golder.com, martha_smith@golder.com	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES NO — PWS I.D. #:
SAMPLER NAME (PRINT): M. Taylor / C. Joyner	SAMPLER SIGNATURE: M. Taylor / [signature]	**Turn Around Time:** Circle: (10) 5 Days Standard or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE): Hexavalent Chromium (7196) (ue)								COMMENTS
1) MW-27D	X					8/25/2020	1548	1548	GW	1	X								Reporting Group C-North Pond
2) Duplicate - NAP	X					8/25/2020	1610	1610	GW	1	X								
3) MW-~~33~~MI-34	X					8/25/2020	1520	1520	GW	1	X								
4) MW-~~34~~MI-33	X					8/25/2020	1637	1637	GW	1	X								
5)																			
6)					MT														
7)																			
8)																			
9)																			
10)																			

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
M. Taylor	8/26/2020 / 0852	Cate Rupp	8/26/2020 0852
Cate Rupp	8/26/2020 10:17	[signature]	8/26/20 852

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 177 **COOLER TEMP** 3.5 °C
Custody Seals used and intact? (Y / N) Received on ice? (Y / N)

GA 20H1289
BPS: North East and West Ponds S
Recd: 08/26/2020 **Due:** 09/10/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone (hon subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed: contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples: 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Sample Conditions Checklist

Samples Received at:	**1.10°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Sample Conditions Checklist

Samples Received at:	**2.50°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:39:36PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Sample Conditions Checklist

Samples Received at:	**3.50°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

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

September 28, 2020

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

RE: Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory between August 25, 2020 and August 26, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville
- Pace Analytical Services - Eden
- Pace Analytical Services - Greensburg

This revision was issued on 9/28/20 to update reporting units, per client request.

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

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Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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
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

Pace Analytical Services Asheville
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 Eden
205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738
North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

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SAMPLE SUMMARY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492361001	**MW-26S**	Water	08/25/20 10:11	08/25/20 15:28
92492361002	**MW-26D**	Water	08/25/20 11:35	08/25/20 15:28
92492361003	**MW-25S**	Water	08/25/20 12:45	08/25/20 15:28
92492361004	**MW-25D**	Water	08/25/20 13:32	08/25/20 15:28
92492361005	**MW-27S**	Water	08/25/20 15:01	08/26/20 15:45
92492361006	**MW-28**	Water	08/26/20 10:10	08/26/20 15:45

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492361001	**MW-26S**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492361002	**MW-26D**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492361003	**MW-25S**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492361004	**MW-25D**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	CDC	4	PASI-A
92492361005	**MW-27S**	SM 2540C-2011	SOB	1	PASI-E

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SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6010D	DS, SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A
92492361006	**MW-28**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	BG2, JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A

PASI-A = Pace Analytical Services - Asheville
PASI-E = Pace Analytical Services - Eden
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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9800 Kincey Ave. Suite 100
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(704)875-9092

SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492361001	**MW-26S**					
SM 2540C-2011	Total Dissolved Solids	130	mg/L	25.0	08/27/20 09:46	
EPA 6010D	Barium	28.0	ug/L	5.0	09/01/20 04:19	
EPA 6010D	Calcium	12000	ug/L	100	09/01/20 04:19	
EPA 6010D	Selenium	5.7J	ug/L	10.0	09/01/20 04:19	
EPA 6010D	Hardness, Total(SM 2340B)	38600	ug/L	662	09/01/20 04:19	
EPA 6020B	Cobalt	0.058J	ug/L	0.10	08/31/20 23:00	
EPA 6020B	Iron	132	ug/L	50.0	08/31/20 23:00	
EPA 6020B	Lithium	0.82J	ug/L	2.5	08/31/20 23:00	
EPA 6020B	Manganese	25.8	ug/L	0.50	08/31/20 23:00	
EPA 6020B	Tin	0.33J	ug/L	0.50	08/31/20 23:00	
EPA 9315	Radium-226	0.0527 ± 0.177 (0.446) C:86% T:NA	pCi/L		09/10/20 07:34	
EPA 9320	Radium-228	0.574 ± 0.499 (1.02) C:71% T:83%	pCi/L		09/15/20 14:39	
Total Radium Calculation	Total Radium	0.627 ± 0.676 (1.47)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	3.2	mg/L	1.0	08/26/20 13:03	
EPA 9056A	Sulfate	10.6	mg/L	1.0	08/26/20 13:03	
92492361002	**MW-26D**					
SM 2540C-2011	Total Dissolved Solids	302	mg/L	25.0	08/27/20 09:47	
EPA 6010D	Barium	196	ug/L	5.0	09/01/20 04:23	
EPA 6010D	Calcium	46000	ug/L	100	09/01/20 04:23	
EPA 6010D	Molybdenum	6.9	ug/L	5.0	09/01/20 04:23	
EPA 6010D	Selenium	5.2J	ug/L	10.0	09/01/20 04:23	
EPA 6010D	Hardness, Total(SM 2340B)	154000	ug/L	662	09/01/20 04:23	
EPA 6020B	Cobalt	1.8	ug/L	0.10	08/31/20 23:11	
EPA 6020B	Iron	4010	ug/L	1250	09/01/20 12:25	
EPA 6020B	Lithium	4.6	ug/L	2.5	08/31/20 23:11	
EPA 6020B	Manganese	2140	ug/L	12.5	09/01/20 12:25	
EPA 6020B	Tin	0.32J	ug/L	0.50	08/31/20 23:11	
EPA 9315	Radium-226	0.186 ± 0.192 (0.349) C:85% T:NA	pCi/L		09/10/20 07:34	
EPA 9320	Radium-228	0.402 ± 0.393 (0.806) C:72% T:81%	pCi/L		09/15/20 14:39	
Total Radium Calculation	Total Radium	0.588 ± 0.585 (1.16)	pCi/L		09/16/20 09:19	
EPA 350.1 Rev 2.0 1993	Nitrogen, Ammonia	0.080J	mg/L	0.10	09/05/20 11:18	
EPA 9056A	Chloride	8.8	mg/L	1.0	08/26/20 13:30	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492361002	**MW-26D**					
EPA 9056A	Sulfate	51.5	mg/L	1.0	08/26/20 13:30	
92492361003	**MW-25S**					
SM 2540C-2011	Total Dissolved Solids	268	mg/L	25.0	08/27/20 09:47	
EPA 6010D	Barium	24.4	ug/L	5.0	09/01/20 04:26	
EPA 6010D	Calcium	45300	ug/L	100	09/01/20 04:26	
EPA 6010D	Hardness, Total(SM 2340B)	158000	ug/L	662	09/01/20 04:26	
EPA 6020B	Cobalt	0.96	ug/L	0.10	08/31/20 23:19	
EPA 6020B	Iron	958	ug/L	50.0	08/31/20 23:19	
EPA 6020B	Lead	0.091J	ug/L	0.10	08/31/20 23:19	
EPA 6020B	Lithium	0.74J	ug/L	2.5	08/31/20 23:19	
EPA 6020B	Manganese	264	ug/L	2.5	09/01/20 12:29	
EPA 9315	Radium-226	0.229 ± 0.215 (0.381) C:84% T:NA	pCi/L		09/10/20 08:27	
EPA 9320	Radium-228	0.311 ± 0.333 (0.691) C:72% T:92%	pCi/L		09/15/20 14:39	
Total Radium Calculation	Total Radium	0.540 ± 0.548 (1.07)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	8.9	mg/L	1.0	08/26/20 14:51	
EPA 9056A	Fluoride	0.095J	mg/L	0.10	08/26/20 14:51	
EPA 9056A	Nitrate as N	0.084J	mg/L	0.10	08/26/20 14:51	
EPA 9056A	Sulfate	28.1	mg/L	1.0	08/26/20 14:51	
92492361004	**MW-25D**					
SM 2540C-2011	Total Dissolved Solids	222	mg/L	25.0	08/27/20 09:47	
EPA 6010D	Barium	25.6	ug/L	5.0	09/01/20 04:29	
EPA 6010D	Boron	34.6J	ug/L	50.0	09/01/20 04:29	
EPA 6010D	Calcium	35900	ug/L	100	09/01/20 04:29	
EPA 6010D	Molybdenum	4.0J	ug/L	5.0	09/01/20 04:29	
EPA 6010D	Hardness, Total(SM 2340B)	117000	ug/L	662	09/01/20 04:29	
EPA 6020B	Cobalt	0.74	ug/L	0.10	09/01/20 01:46	
EPA 6020B	Iron	1440	ug/L	250	09/01/20 12:33	
EPA 6020B	Lithium	3.1	ug/L	2.5	09/01/20 01:46	
EPA 6020B	Manganese	224	ug/L	2.5	09/01/20 12:33	
EPA 9315	Radium-226	1.84 ± 0.562 (0.420) C:88% T:NA	pCi/L		09/10/20 07:34	
EPA 9320	Radium-228	0.811 ± 0.522 (0.996) C:68% T:78%	pCi/L		09/15/20 14:39	
Total Radium Calculation	Total Radium	2.65 ± 1.08 (1.42)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	7.4	mg/L	1.0	08/26/20 15:04	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492361004	**MW-25D**					
EPA 9056A	Sulfate	21.3	mg/L	1.0	08/26/20 15:04	
92492361005	**MW-27S**					
SM 2540C-2011	Total Dissolved Solids	624	mg/L	50.0	08/31/20 10:31	
EPA 6010D	Barium	96.2	ug/L	5.0	09/01/20 05:02	
EPA 6010D	Boron	1580	ug/L	50.0	09/01/20 05:02	
EPA 6010D	Calcium	101000	ug/L	500	09/01/20 17:30	
EPA 6010D	Hardness, Total(SM 2340B)	448000	ug/L	3310	09/01/20 17:30	
EPA 6020B	Cobalt	0.28	ug/L	0.10	09/01/20 02:09	
EPA 6020B	Iron	77.9	ug/L	50.0	09/01/20 02:09	
EPA 6020B	Lithium	4.1	ug/L	2.5	09/01/20 02:09	
EPA 6020B	Manganese	52.1	ug/L	0.50	09/01/20 02:09	
EPA 9315	Radium-226	0.448 ± 0.270 (0.348) C:88% T:NA	pCi/L		09/10/20 07:35	
EPA 9320	Radium-228	0.452 ± 0.462 (0.959) C:70% T:77%	pCi/L		09/15/20 14:40	
Total Radium Calculation	Total Radium	0.900 ± 0.732 (1.31)	pCi/L		09/16/20 09:19	
EPA 9056A	Chloride	12.4	mg/L	1.0	08/27/20 12:55	
EPA 9056A	Nitrate as N	0.18	mg/L	0.10	08/27/20 12:55	
EPA 9056A	Sulfate	126	mg/L	3.0	08/27/20 14:03	
92492361006	**MW-28**					
SM 2540C-2011	Total Dissolved Solids	419	mg/L	25.0	08/31/20 10:33	
EPA 6010D	Barium	55.6	ug/L	5.0	09/01/20 05:05	
EPA 6010D	Boron	512	ug/L	50.0	09/01/20 05:05	
EPA 6010D	Calcium	66700	ug/L	100	09/01/20 05:05	
EPA 6010D	Nickel	13.3	ug/L	5.0	09/01/20 05:05	
EPA 6010D	Hardness, Total(SM 2340B)	270000	ug/L	662	09/01/20 05:05	
EPA 6020B	Cobalt	0.26	ug/L	0.10	09/01/20 02:12	
EPA 6020B	Iron	329	ug/L	50.0	09/01/20 02:12	
EPA 6020B	Lithium	44.9	ug/L	2.5	09/01/20 02:12	
EPA 6020B	Manganese	7.9	ug/L	2.5	09/01/20 12:37	
EPA 6020B	Tin	0.47J	ug/L	0.50	09/01/20 02:12	
EPA 9315	Radium-226	0.261 ± 0.215 (0.359) C:92% T:NA	pCi/L		09/10/20 07:35	
EPA 9320	Radium-228	0.172 ± 0.397 (0.882) C:68% T:87%	pCi/L		09/15/20 14:40	
Total Radium Calculation	Total Radium	0.433 ± 0.612 (1.24)	pCi/L		09/16/20 09:19	

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SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492361006	**MW-28**					
EPA 9056A	Chloride	10.2	mg/L	1.0	08/27/20 13:36	
EPA 9056A	Nitrate as N	0.18	mg/L	0.10	08/27/20 13:36	
EPA 9056A	Sulfate	111	mg/L	2.0	08/27/20 15:25	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26S **Lab ID: 92492361001** Collected: 08/25/20 10:11 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**130**	mg/L	25.0	25.0	1		08/27/20 09:46		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:19	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:19	7440-38-2	
Barium	**28.0**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:19	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:19	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:19	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:19	7440-43-9	
Calcium	**12000**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:19	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:19	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:19	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:19	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:19	7440-02-0	
Selenium	**5.7J**	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:19	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:19	7440-22-4	
Hardness, Total(SM 2340B)	**38600**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:19		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:19	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:19	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.058J**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:00	7440-48-4	
Iron	**132**	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 23:00	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 23:00	7439-92-1	
Lithium	**0.82J**	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 23:00	7439-93-2	
Manganese	**25.8**	ug/L	0.50	0.47	1	08/28/20 01:18	08/31/20 23:00	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:00	7440-28-0	
Tin	**0.33J**	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 23:00	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:12	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 11:16	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**3.2**	mg/L	1.0	0.60	1		08/26/20 13:03	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 13:03	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 13:03	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26S **Lab ID: 92492361001** Collected: 08/25/20 10:11 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**10.6**	mg/L	1.0	0.50	1		08/26/20 13:03	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26D **Lab ID: 92492361002** Collected: 08/25/20 11:35 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**302**	mg/L	25.0	25.0	1		08/27/20 09:47		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:23	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:23	7440-38-2	
Barium	**196**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:23	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:23	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:23	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:23	7440-43-9	
Calcium	**46000**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:23	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:23	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:23	7440-50-8	
Molybdenum	**6.9**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:23	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:23	7440-02-0	
Selenium	**5.2J**	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:23	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:23	7440-22-4	
Hardness, Total(SM 2340B)	**154000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:23		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:23	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:23	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**1.8**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:11	7440-48-4	
Iron	**4010**	ug/L	1250	523	25	08/28/20 01:18	09/01/20 12:25	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 23:11	7439-92-1	
Lithium	**4.6**	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 23:11	7439-93-2	
Manganese	**2140**	ug/L	12.5	11.8	25	08/28/20 01:18	09/01/20 12:25	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:11	7440-28-0	
Tin	**0.32J**	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 23:11	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:14	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	**0.080J**	mg/L	0.10	0.070	1		09/05/20 11:18	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**8.8**	mg/L	1.0	0.60	1		08/26/20 13:30	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 13:30	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 13:30	14797-55-8	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26D **Lab ID: 92492361002** Collected: 08/25/20 11:35 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**51.5**	mg/L	1.0	0.50	1		08/26/20 13:30	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25S **Lab ID: 92492361003** Collected: 08/25/20 12:45 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**268**	mg/L	25.0	25.0	1		08/27/20 09:47		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:26	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:26	7440-38-2	
Barium	**24.4**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:26	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:26	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:26	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:26	7440-43-9	
Calcium	**45300**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:26	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:26	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:26	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:26	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:26	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:26	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:26	7440-22-4	
Hardness, Total(SM 2340B)	**158000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:26		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:26	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:26	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.96**	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:19	7440-48-4	
Iron	**958**	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 23:19	7439-89-6	
Lead	**0.091J**	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 23:19	7439-92-1	
Lithium	**0.74J**	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 23:19	7439-93-2	
Manganese	**264**	ug/L	2.5	2.4	5	08/28/20 01:18	09/01/20 12:29	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 23:19	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 23:19	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:17	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 11:19	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**8.9**	mg/L	1.0	0.60	1		08/26/20 14:51	16887-00-6	
Fluoride	**0.095J**	mg/L	0.10	0.050	1		08/26/20 14:51	16984-48-8	
Nitrate as N	**0.084J**	mg/L	0.10	0.060	1		08/26/20 14:51	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25S **Lab ID: 92492361003** Collected: 08/25/20 12:45 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**28.1**	mg/L	1.0	0.50	1		08/26/20 14:51	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25D **Lab ID: 92492361004** Collected: 08/25/20 13:32 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**222**	mg/L	25.0	25.0	1		08/27/20 09:47		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:29	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:29	7440-38-2	
Barium	**25.6**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:29	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:29	7440-41-7	
Boron	**34.6J**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:29	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:29	7440-43-9	
Calcium	**35900**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:29	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:29	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:29	7440-50-8	
Molybdenum	**4.0J**	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:29	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:29	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:29	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:29	7440-22-4	
Hardness, Total(SM 2340B)	**117000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:29		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:29	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:29	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.74**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 01:46	7440-48-4	
Iron	**1440**	ug/L	250	105	5	08/28/20 01:18	09/01/20 12:33	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 01:46	7439-92-1	
Lithium	**3.1**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 01:46	7439-93-2	
Manganese	**224**	ug/L	2.5	2.4	5	08/28/20 01:18	09/01/20 12:33	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 01:46	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 01:46	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:19	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 11:21	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**7.4**	mg/L	1.0	0.60	1		08/26/20 15:04	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/26/20 15:04	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/26/20 15:04	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25D **Lab ID: 92492361004** Collected: 08/25/20 13:32 Received: 08/25/20 15:28 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**21.3**	mg/L	1.0	0.50	1		08/26/20 15:04	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-27S **Lab ID: 92492361005** Collected: 08/25/20 15:01 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**624**	mg/L	50.0	50.0	1		08/31/20 10:31		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:02	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:02	7440-38-2	
Barium	**96.2**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:02	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:02	7440-41-7	
Boron	**1580**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:02	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:02	7440-43-9	
Calcium	**101000**	ug/L	500	471	5	08/30/20 17:58	09/01/20 17:30	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:02	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:02	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:02	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:02	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:02	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:02	7440-22-4	
Hardness, Total(SM 2340B)	**448000**	ug/L	3310	655	5	08/30/20 17:58	09/01/20 17:30		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:02	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:02	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.28**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:09	7440-48-4	
Iron	**77.9**	ug/L	50.0	20.9	1	08/28/20 01:18	09/01/20 02:09	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 02:09	7439-92-1	
Lithium	**4.1**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 02:09	7439-93-2	
Manganese	**52.1**	ug/L	0.50	0.47	1	08/28/20 01:18	09/01/20 02:09	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:09	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 02:09	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:31	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 12:48	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**12.4**	mg/L	1.0	0.60	1		08/27/20 12:55	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/27/20 12:55	16984-48-8	
Nitrate as N	**0.18**	mg/L	0.10	0.060	1		08/27/20 12:55	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-27S **Lab ID: 92492361005** Collected: 08/25/20 15:01 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**126**	mg/L	3.0	1.5	3		08/27/20 14:03	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-28 **Lab ID: 92492361006** Collected: 08/26/20 10:10 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**419**	mg/L	25.0	25.0	1		08/31/20 10:33		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 05:05	7440-36-0	
Arsenic	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:05	7440-38-2	
Barium	**55.6**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:05	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 05:05	7440-41-7	
Boron	**512**	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 05:05	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 05:05	7440-43-9	
Calcium	**66700**	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 05:05	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 05:05	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 05:05	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:05	7439-98-7	
Nickel	**13.3**	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 05:05	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 05:05	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 05:05	7440-22-4	
Hardness, Total(SM 2340B)	**270000**	ug/L	662	131	1	08/30/20 17:58	09/01/20 05:05		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 05:05	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 05:05	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.26**	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:12	7440-48-4	
Iron	**329**	ug/L	50.0	20.9	1	08/28/20 01:18	09/01/20 02:12	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	09/01/20 02:12	7439-92-1	
Lithium	**44.9**	ug/L	2.5	0.39	1	08/28/20 01:18	09/01/20 02:12	7439-93-2	
Manganese	**7.9**	ug/L	2.5	2.4	5	08/28/20 01:18	09/01/20 12:37	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	09/01/20 02:12	7440-28-0	
Tin	**0.47J**	ug/L	0.50	0.24	1	08/28/20 01:18	09/01/20 02:12	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/31/20 20:46	09/01/20 15:38	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 12:49	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**10.2**	mg/L	1.0	0.60	1		08/27/20 13:36	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/27/20 13:36	16984-48-8	
Nitrate as N	**0.18**	mg/L	0.10	0.060	1		08/27/20 13:36	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-28 **Lab ID: 92492361006** Collected: 08/26/20 10:10 Received: 08/26/20 15:45 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	**111**	mg/L	2.0	1.0	2		08/27/20 15:25	14808-79-8	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 562744 | Analysis Method: SM 2540C-2011
QC Batch Method: SM 2540C-2011 | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

METHOD BLANK: 2984270 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/27/20 09:38	

LABORATORY CONTROL SAMPLE: 2984271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2984272

Parameter	Units	92492617001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	347	336	3	25	

SAMPLE DUPLICATE: 2984273

Parameter	Units	92492363002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	408	5	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 563387
QC Batch Method: SM 2540C-2011
Analysis Method: SM 2540C-2011
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492361005, 92492361006

METHOD BLANK: 2987203 Matrix: Water
Associated Lab Samples: 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/31/20 10:31	

LABORATORY CONTROL SAMPLE: 2987204

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	260	104	90-110	

SAMPLE DUPLICATE: 2987205

Parameter	Units	92492605003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	570	552	3	25	

SAMPLE DUPLICATE: 2987206

Parameter	Units	92492846001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	56.0	54.0	4	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 563522 | Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

METHOD BLANK: 2987909 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.12	09/01/20 14:41	

LABORATORY CONTROL SAMPLE: 2987910

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2987911 2987912

Parameter	Units	92492846001 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	2.4	2.4	96	97	75-125	1	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2987913 2987914

Parameter	Units	92492363002 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	2.2	2.3	85	90	75-125	6	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 563337
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

METHOD BLANK: 2986933 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.0	09/01/20 03:34	
Arsenic	ug/L	ND	10.0	4.7	09/01/20 03:34	
Barium	ug/L	ND	5.0	3.5	09/01/20 03:34	
Beryllium	ug/L	ND	1.0	0.70	09/01/20 03:34	
Boron	ug/L	ND	50.0	32.4	09/01/20 03:34	
Cadmium	ug/L	ND	1.0	0.40	09/01/20 03:34	
Calcium	ug/L	ND	100	94.2	09/01/20 03:34	
Chromium	ug/L	ND	5.0	3.7	09/01/20 03:34	
Copper	ug/L	ND	5.0	4.3	09/01/20 03:34	
Hardness, Total(SM 2340B)	ug/L	ND	662	131	09/01/20 03:34	
Molybdenum	ug/L	ND	5.0	3.9	09/01/20 03:34	
Nickel	ug/L	ND	5.0	3.5	09/01/20 03:34	
Selenium	ug/L	ND	10.0	4.7	09/01/20 03:34	
Silver	ug/L	ND	5.0	2.5	09/01/20 03:34	
Vanadium	ug/L	ND	5.0	3.9	09/01/20 03:34	
Zinc	ug/L	ND	10.0	9.5	09/01/20 03:34	

LABORATORY CONTROL SAMPLE: 2986934

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	505	101	80-120	
Arsenic	ug/L	500	507	101	80-120	
Barium	ug/L	500	511	102	80-120	
Beryllium	ug/L	500	519	104	80-120	
Boron	ug/L	500	494	99	80-120	
Cadmium	ug/L	500	506	101	80-120	
Calcium	ug/L	5000	5040	101	80-120	
Chromium	ug/L	500	506	101	80-120	
Copper	ug/L	500	517	103	80-120	
Hardness, Total(SM 2340B)	ug/L	33100	33100	100	80-120	
Molybdenum	ug/L	500	516	103	80-120	
Nickel	ug/L	500	511	102	80-120	
Selenium	ug/L	500	500	100	80-120	
Silver	ug/L	250	251	100	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	492	98	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986935 2986936

Parameter	Units	92492846001 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	513	511	103	102	75-125	0	20	
Arsenic	ug/L	ND	500	500	531	536	106	107	75-125	1	20	
Barium	ug/L	14.4	500	500	534	531	104	103	75-125	1	20	
Beryllium	ug/L	ND	500	500	532	528	106	106	75-125	1	20	
Boron	ug/L	ND	500	500	526	525	104	104	75-125	0	20	
Cadmium	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Calcium	ug/L	2.9 mg/L	5000	5000	8130	8110	104	104	75-125	0	20	
Chromium	ug/L	ND	500	500	521	525	104	105	75-125	1	20	
Copper	ug/L	ND	500	500	524	523	104	104	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	15800	33100	33100	50000	50100	103	104	75-125	0		
Molybdenum	ug/L	ND	500	500	526	524	105	105	75-125	1	20	
Nickel	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Selenium	ug/L	ND	500	500	535	538	107	107	75-125	1	20	
Silver	ug/L	ND	250	250	258	258	103	103	75-125	0	20	
Vanadium	ug/L	ND	500	500	516	520	103	104	75-125	1	20	
Zinc	ug/L	ND	500	500	527	531	105	106	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986937 2986938

Parameter	Units	92492363002 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	518	515	104	103	75-125	1	20	
Arsenic	ug/L	7.7J	500	500	543	538	107	106	75-125	1	20	
Barium	ug/L	98.5	500	500	614	605	103	101	75-125	1	20	
Beryllium	ug/L	ND	500	500	531	518	106	104	75-125	3	20	
Boron	ug/L	0.21 mg/L	500	500	735	727	106	104	75-125	1	20	
Cadmium	ug/L	ND	500	500	524	515	105	103	75-125	2	20	
Calcium	ug/L	70.3 mg/L	5000	5000	74400	73200	82	56	75-125	2	20	M1
Chromium	ug/L	ND	500	500	512	498	102	100	75-125	3	20	
Copper	ug/L	ND	500	500	530	528	106	105	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	222000	33100	33100	252000	248000	93	80	75-125	2		
Molybdenum	ug/L	9.3	500	500	540	530	106	104	75-125	2	20	
Nickel	ug/L	ND	500	500	511	500	102	100	75-125	2	20	
Selenium	ug/L	5.3J	500	500	532	533	105	106	75-125	0	20	
Silver	ug/L	ND	250	250	258	253	103	101	75-125	2	20	
Vanadium	ug/L	ND	500	500	523	508	105	102	75-125	3	20	
Zinc	ug/L	ND	500	500	518	501	103	100	75-125	3	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	08/31/20 22:26	
Iron	ug/L	ND	50.0	20.9	08/31/20 22:26	
Lead	ug/L	ND	0.10	0.077	08/31/20 22:26	
Lithium	ug/L	ND	2.5	0.39	08/31/20 22:26	
Manganese	ug/L	ND	0.50	0.47	08/31/20 22:26	
Thallium	ug/L	ND	0.10	0.050	08/31/20 22:26	
Tin	ug/L	ND	0.50	0.24	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	
Iron	ug/L	625	660	106	80-120	
Lead	ug/L	50	49.8	100	80-120	
Lithium	ug/L	50	47.3	95	80-120	
Manganese	ug/L	50	51.8	104	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	50.5	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	61.9	10	10	76.5	73.6	146	118	75-125	4	20	M6
Iron	ug/L	17300	625	625	18700	18300	229	157	75-125	2	20	M6
Lead	ug/L	ND	50	50	49.2	50.3	98	101	75-125	2	20	
Lithium	ug/L	2.8	50	50	46.9	46.5	88	87	75-125	1	20	
Manganese	ug/L	3530	50	50	3800	3680	537	298	75-125	3	20	M6
Thallium	ug/L	ND	10	10	10	10.2	100	102	75-125	2	20	
Tin	ug/L	ND	50	50	50.5	51.0	101	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 564672
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

METHOD BLANK: 2993029 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/05/20 10:40	

LABORATORY CONTROL SAMPLE: 2993030

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993031 2993032

Parameter	Units	92493344001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.8	4.9	97	97	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993708 2993709

Parameter	Units	92493364001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	5.0	4.9	98	98	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 564677
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361005, 92492361006

METHOD BLANK: 2993041 Matrix: Water
Associated Lab Samples: 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/05/20 12:09	

LABORATORY CONTROL SAMPLE: 2993042

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	5.0	101	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993043 2993044

Parameter	Units	92493679001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	1.1	5	5	6.0	6.0	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993045 2993046

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	1.3	5	5	6.2	6.2	99	99	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 562469 | Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A | Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

METHOD BLANK: 2983027 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/26/20 12:09	
Fluoride	mg/L	ND	0.10	0.050	08/26/20 12:09	
Nitrate as N	mg/L	ND	0.10	0.060	08/26/20 12:09	
Sulfate	mg/L	ND	1.0	0.50	08/26/20 12:09	

LABORATORY CONTROL SAMPLE: 2983028

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.7	95	90-110	
Fluoride	mg/L	2.5	2.4	98	90-110	
Nitrate as N	mg/L	2.5	2.3	92	90-110	
Sulfate	mg/L	50	48.1	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2983029 2983030

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	33.0	50	50	80.6	81.6	95	97	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.8	2.9	111	113	90-110	2	10	M1
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	97	98	90-110	1	10	
Sulfate	mg/L	42.1	50	50	90.9	91.6	98	99	90-110	1	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 562799
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492361005, 92492361006

METHOD BLANK: 2984477 Matrix: Water
Associated Lab Samples: 92492361005, 92492361006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/27/20 12:28	
Fluoride	mg/L	ND	0.10	0.050	08/27/20 12:28	
Nitrate as N	mg/L	ND	0.10	0.060	08/27/20 12:28	
Sulfate	mg/L	ND	1.0	0.50	08/27/20 12:28	

LABORATORY CONTROL SAMPLE: 2984478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	49.0	98	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Nitrate as N	mg/L	2.5	2.4	97	90-110	
Sulfate	mg/L	50	49.4	99	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2984479 2984480

Parameter	Units	92492605003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.5	50	50	56.0	56.6	99	100	90-110	1	10	
Fluoride	mg/L	0.14	2.5	2.5	2.7	2.7	101	104	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.5	2.5	98	100	90-110	2	10	
Sulfate	mg/L	71.0	50	50	109	109	75	77	90-110	1	10	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2984481 2984482

Parameter	Units	92492605007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.5	50	50	55.8	56.7	99	100	90-110	2	10	
Fluoride	mg/L	0.060J	2.5	2.5	2.7	2.8	105	108	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.5	97	99	90-110	2	10	
Sulfate	mg/L	60.7	50	50	91.2	99.8	61	78	90-110	9	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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Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26S **Lab ID: 92492361001** Collected: 08/25/20 10:11 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.0527 ± 0.177 (0.446) C:86% T:NA**	pCi/L	09/10/20 07:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.574 ± 0.499 (1.02) C:71% T:83%**	pCi/L	09/15/20 14:39	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.627 ± 0.676 (1.47)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-26D **Lab ID: 92492361002** Collected: 08/25/20 11:35 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.186 ± 0.192 (0.349) C:85% T:NA**	pCi/L	09/10/20 07:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.402 ± 0.393 (0.806) C:72% T:81%**	pCi/L	09/15/20 14:39	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.588 ± 0.585 (1.16)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25S **Lab ID: 92492361003** Collected: 08/25/20 12:45 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.229 ± 0.215 (0.381) C:84% T:NA**	pCi/L	09/10/20 08:27	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.311 ± 0.333 (0.691) C:72% T:92%**	pCi/L	09/15/20 14:39	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.540 ± 0.548 (1.07)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-25D **Lab ID: 92492361004** Collected: 08/25/20 13:32 Received: 08/25/20 15:28 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**1.84 ± 0.562 (0.420) C:88% T:NA**	pCi/L	09/10/20 07:34	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.811 ± 0.522 (0.996) C:68% T:78%**	pCi/L	09/15/20 14:39	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**2.65 ± 1.08 (1.42)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-27S **Lab ID: 92492361005** Collected: 08/25/20 15:01 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.448 ± 0.270 (0.348) C:88% T:NA**	pCi/L	09/10/20 07:35	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.452 ± 0.462 (0.959) C:70% T:77%**	pCi/L	09/15/20 14:40	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.900 ± 0.732 (1.31)**	pCi/L	09/16/20 09:19	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Sample: MW-28 **Lab ID: 92492361006** Collected: 08/26/20 10:10 Received: 08/26/20 15:45 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.261 ± 0.215 (0.359) C:92% T:NA**	pCi/L	09/10/20 07:35	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.172 ± 0.397 (0.882) C:68% T:87%**	pCi/L	09/15/20 14:40	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.433 ± 0.612 (1.24)**	pCi/L	09/16/20 09:19	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch:	412342	Analysis Method:	EPA 9320
QC Batch Method:	EPA 9320	Analysis Description:	9320 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

METHOD BLANK: 1994498 Matrix: Water

Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.550 ± 0.369 (0.698) C:73% T:85%	pCi/L	09/15/20 14:39	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

QC Batch: 412351 | Analysis Method: EPA 9315
QC Batch Method: EPA 9315 | Analysis Description: 9315 Total Radium
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

METHOD BLANK: 1994513 Matrix: Water
Associated Lab Samples: 92492361001, 92492361002, 92492361003, 92492361004, 92492361005, 92492361006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0558 ± 0.230 (0.577) C:80% T:NA	pCi/L	09/10/20 07:35	

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QUALIFIERS

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

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.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492361001	**MW-26S**	SM 2540C-2011	562744		
92492361002	**MW-26D**	SM 2540C-2011	562744		
92492361003	**MW-25S**	SM 2540C-2011	562744		
92492361004	**MW-25D**	SM 2540C-2011	562744		
92492361005	**MW-27S**	SM 2540C-2011	563387		
92492361006	**MW-28**	SM 2540C-2011	563387		
92492361001	**MW-26S**	EPA 3010A	563337	EPA 6010D	563346
92492361002	**MW-26D**	EPA 3010A	563337	EPA 6010D	563346
92492361003	**MW-25S**	EPA 3010A	563337	EPA 6010D	563346
92492361004	**MW-25D**	EPA 3010A	563337	EPA 6010D	563346
92492361005	**MW-27S**	EPA 3010A	563337	EPA 6010D	563346
92492361006	**MW-28**	EPA 3010A	563337	EPA 6010D	563346
92492361001	**MW-26S**	EPA 3010A	562977	EPA 6020B	562996
92492361002	**MW-26D**	EPA 3010A	562977	EPA 6020B	562996
92492361003	**MW-25S**	EPA 3010A	562977	EPA 6020B	562996
92492361004	**MW-25D**	EPA 3010A	562977	EPA 6020B	562996
92492361005	**MW-27S**	EPA 3010A	562977	EPA 6020B	562996
92492361006	**MW-28**	EPA 3010A	562977	EPA 6020B	562996
92492361001	**MW-26S**	EPA 7470A	563522	EPA 7470A	563588
92492361002	**MW-26D**	EPA 7470A	563522	EPA 7470A	563588
92492361003	**MW-25S**	EPA 7470A	563522	EPA 7470A	563588
92492361004	**MW-25D**	EPA 7470A	563522	EPA 7470A	563588
92492361005	**MW-27S**	EPA 7470A	563522	EPA 7470A	563588
92492361006	**MW-28**	EPA 7470A	563522	EPA 7470A	563588
92492361001	**MW-26S**	EPA 9315	412351		
92492361002	**MW-26D**	EPA 9315	412351		
92492361003	**MW-25S**	EPA 9315	412351		
92492361004	**MW-25D**	EPA 9315	412351		
92492361005	**MW-27S**	EPA 9315	412351		
92492361006	**MW-28**	EPA 9315	412351		
92492361001	**MW-26S**	EPA 9320	412342		
92492361002	**MW-26D**	EPA 9320	412342		
92492361003	**MW-25S**	EPA 9320	412342		
92492361004	**MW-25D**	EPA 9320	412342		
92492361005	**MW-27S**	EPA 9320	412342		
92492361006	**MW-28**	EPA 9320	412342		
92492361001	**MW-26S**	Total Radium Calculation	414065		
92492361002	**MW-26D**	Total Radium Calculation	414065		
92492361003	**MW-25S**	Total Radium Calculation	414065		
92492361004	**MW-25D**	Total Radium Calculation	414065		
92492361005	**MW-27S**	Total Radium Calculation	414065		
92492361006	**MW-28**	Total Radium Calculation	414065		
92492361001	**MW-26S**	EPA 350.1 Rev 2.0 1993	564672		
92492361002	**MW-26D**	EPA 350.1 Rev 2.0 1993	564672		
92492361003	**MW-25S**	EPA 350.1 Rev 2.0 1993	564672		

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (D)-Revised Report
Pace Project No.: 92492361

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492361004	**MW-25D**	EPA 350.1 Rev 2.0 1993	564672		
92492361005	**MW-27S**	EPA 350.1 Rev 2.0 1993	564677		
92492361006	**MW-28**	EPA 350.1 Rev 2.0 1993	564677		
92492361001	**MW-26S**	EPA 9056A	562469		
92492361002	**MW-26D**	EPA 9056A	562469		
92492361003	**MW-25S**	EPA 9056A	562469		
92492361004	**MW-25D**	EPA 9056A	562469		
92492361005	**MW-27S**	EPA 9056A	562799		
92492361006	**MW-28**	EPA 9056A	562799		

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CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorde

WO# : 92492361

92492361

ALL SHADED

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment Report D Sentinel NAP	State: VA / County/City: Bremo Bluff Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #:
Collected By (print): ~~M. Taylor~~ / C. Joyner CJ	Purchase Order # : 20139823 Quote #:
Collected By (signature):	Turnaround Date Required: Standard
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply)

Compliance Monitoring? [X] Yes [ ] No

DW PWS ID #:

DW Location Code:

Immediately Packed on Ice: [X] Yes [ ] No

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	U	U	1	2	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 _____ (O1) Other 1 _____

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228			Lab Sample # / Comments:
MW-26S	GW	G	8-25-2020	1011			N	7	X	X	X	X	X	X	X	X			001
MW-26D	GW	G	8-25-2020	1135			N	7	X	X	X	X	X	X	X	X			002
MW-25S	GW	G	8-25-2020	1245			N	7	X	X	X	X	X	X	X	X			003
MW-25D	GW	G	8-25-2020	1332			N	7	X	X	X	X	X	X	X	X			004

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
Cl Strips: D205
Sample pH Acceptable: Y N NA
pH Strips: 232518V
Sulfide Present: Y N NA
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492361

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group D for more details.

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 3.2 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.8 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Golder	8/25/2020 1405	Paul Jones	8/25/20 1405
Paul Jones	8/25/20 1528	Rachel Burruss	8-25-20 1528

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: 1 of: 1

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LAB USE ONLY- Affix Workord

WO# : 92492361

PM: NMG Due Date: 09/17/20

CLIENT: 92-Golder

ALL SHADED

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #:
Collected By (signature): M Taylor / C Joyner	Turnaround Date Required: Standard
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply)
	Compliance Monitoring? [X] Yes [ ] No
	DW PWS ID #: DW Location Code:
	Immediately Packed on Ice: [X] Yes [ ] No
	Field Filtered (if applicable): [ ] Yes [X] No Analysis: _____

Container Preservative Type

1	1	U	U	1	2	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 _____ (O1) Other 1 _____

* 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)

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228			Lab Profile/Line:
mw-27s	GW	G	8/25/2020	1501			N	7	X	X	X	X	X	X	X	X			* all bottles preserved 005
mw-28	GW	G	8/26/2020	1010			N	7	X	X	X	X	X	X	X	X			on ice * 006
						MT													

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ✓ N NA
Custody Signatures Present ✓ N NA
Collector Signature Present ✓ N NA
Bottles Intact ✓ N NA
Correct Bottles ✓ N NA
Sufficient Volume ✓ N NA
Samples Received on Ice ✓ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ✓ N NA
Residual Chlorine Present Y ✓ NA
Cl Strips: 0205
Sample pH Acceptable ✓ NNA
pH Strips: 232518V
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492361

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group D for more details. North Pond Sentinel	Type of Ice Used: (Wet) Blue Dry None	SHORT HOLDS PRESENT (<72 hours): (Y) N N/A	LAB Sample Temperature Info: Temp Blank Received: Y N NA; Therm ID#: 1-3; Cooler 1 Temp Upon Receipt: 4.3 oC; Cooler 1 Therm Corr. Factor 0.0 oC; Cooler 1 Corrected Temp: 4.3 oC; Comments:
	Packing Material Used:	Lab Tracking #:	
	Radchem sample(s) screened (<500 cpm): Y N NA	Samples received via: FEDEX UPS Client Courier Pace Courier	

Relinquished by/Company: (Signature) M Taylor / Golder	Date/Time: 8/26/2020 1405	Received by/Company: (Signature) Charlie Trent	Date/Time: 8/26 14:05	MTJL LAB USE ONLY Table #:
Relinquished by/Company: (Signature) Charlie Trent	Date/Time: 8/26 3:45	Received by/Company: (Signature) Rachel Burruss	Date/Time: 8-26-20 1545	Acctnum: Template: Prelogin: PM: PB:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Trip Blank Received: Y N NA HCL MeOH TSP Other; Non Conformance(s): YES / NO; Page: 1 of: 1

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Enthalpy Analytical
1941 Reymet Road
Richmond, VA 23237
(804)-358-8295 - Telephone
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Analysis Detects Report

Date Issued:

Client Name:

Client Site ID:

Submitted To:

Laboratory Sample ID: **Client Sample ID:**

Parameter	Samp ID	Reference Method	Sample Results	Qual	DL	LOQ	Dil. Factor	Units

There are no reportable results for target analytes in this report.

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

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Certificate of Analysis

Final Report

Sample Delivery Group ID Bremo D 200825

Client Name:	Golder Associates, Inc.	Date Issued:	9/9/2020 2:50:51PM
	2108 W. Laburnum Ave. Suite 200		
	Richmond, VA 23227		
Submitted To:	Amanda Reynolds		
Client Site I.D.:	Bremo Power Station	Purchase Order:	

Enclosed are the results of analyses for samples received by the laboratory in sample delivery group Bremo D 200825 . Work orders included in the sample delivery group:

Work Order	Receive Date	Project Number
20H1255	8/25/2020 4:05:00PM	20139823
20H1288	8/26/2020 8:52:00AM	20139823
20H1338	8/26/2020 4:21:00PM	20139823

Ted Soyars

Technical Director

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

This report shall not be reproduced except in full without the expressed and written approval of an authorized representative of Air Water & Soil Laboratories, Inc.

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 9/9/2020 2:50:51PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-26S	20H1255-01	Ground Water	08/25/2020 10:11	08/25/2020 16:05
MW-26D	20H1255-02	Ground Water	08/25/2020 11:35	08/25/2020 16:05
MW-25S	20H1255-03	Ground Water	08/25/2020 12:45	08/25/2020 16:05
MW-25D	20H1255-04	Ground Water	08/25/2020 13:32	08/25/2020 16:05
MW-27S	20H1288-01	Ground Water	08/25/2020 15:01	08/26/2020 08:52
MW-28	20H1338-01	Ground Water	08/26/2020 10:10	08/26/2020 16:21

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-26S** **Laboratory Sample ID:** **20H1255-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-26D** **Laboratory Sample ID:** **20H1255-02**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	02	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-25S** **Laboratory Sample ID:** **20H1255-03**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	03	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-25D** **Laboratory Sample ID:** **20H1255-04**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	04	18540-29-9	SW7196A	08/26/2020 07:53	08/26/2020 07:53	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-27S** **Laboratory Sample ID:** **20H1288-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/26/2020 10:30	08/26/2020 10:30	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **MW-28** **Laboratory Sample ID:** **20H1338-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/27/2020 08:00	08/27/2020 10:00	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Wet Chemistry Analysis - Quality Control

Air Water & Soil Laboratories, Inc.

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BDH0881 - No Prep Wet Chem										
Blank (BDH0881-BLK1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0881-BS1)				Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100		102	80-120			
Matrix Spike (BDH0881-MS1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	102	5	ug/L	100	BLOD	102	80-120			
Matrix Spike Dup (BDH0881-MSD1)	**Source: 20H1255-01**			Prepared & Analyzed: 08/26/2020						
Chromium, Hexavalent	99	5	ug/L	100	BLOD	99.0	80-120	2.99	20	
Batch BDH0913 - No Prep Wet Chem										
Blank (BDH0913-BLK1)				Prepared & Analyzed: 08/27/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0913-BS1)				Prepared & Analyzed: 08/27/2020						
Chromium, Hexavalent	102	5	ug/L	100		102	80-120			
Matrix Spike (BDH0913-MS1)	**Source: 20H1340-07**			Prepared & Analyzed: 08/27/2020						
Chromium, Hexavalent	55	5	ug/L	100	BLOD	55.0	80-120			*M*
Matrix Spike Dup (BDH0913-MSD1)	**Source: 20H1340-07**			Prepared & Analyzed: 08/27/2020						
Chromium, Hexavalent	49	5	ug/L	100	BLOD	49.0	80-120	11.5	20	*M*

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Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 9/9/2020 2:50:51PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
20H1255-01	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1255-02	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1255-03	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1255-04	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1288-01	100 mL / 100 mL	SW7196A	BDH0881	SDH0789	AH00120
20H1338-01	100 mL / 100 mL	SW7196A	BDH0913	SDH0830	AH00121

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:50:51PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Certified Analyses included in this Report

Analyte	Certifications
SW7196A in Non-Potable Water	
Chromium, Hexavalent	VELAP

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2020
NC	North Carolina DENR	495	12/31/2020
NJDEP	New Jersey DEP	VA015	06/30/2021
NYDOH	New York DOH Drinking Water	12096	04/01/2021
PADEP	NELAC-Pennsylvania Certificate #005	68-03503	10/31/2020
VELAP	NELAC-Virginia Certificate #10886	460021	06/14/2021
WVDEP	West Virginia DEP	350	11/30/2020

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:50:51PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Qualifiers and Definitions

M	Matrix spike recovery is outside established acceptance limits
U	Analyte was not detected and is reported as less than the DL or as defined by the client. The DL has been adjusted for any dilution or concentration of the sample.
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

AIR WATER & SOIL LABORATORIES, INC.

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates Inc	INVOICE TO: Golder	PROJECT NAME/Quote #: Bremo Power Station St
CONTACT: Amanda Reynolds	INVOICE CONTACT:	SITE NAME: Bremo P.S.
ADDRESS: 2108 W Laburnum Ave Ste 200 Richmond VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: 804-358-7900	INVOICE PHONE #:	P.O. #:
FAX #: 804-358-2900	EMAIL: areynolds@golder.com	Pretreatment Program:
Is sample for compliance reporting? YES NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES NO
SAMPLER NAME (PRINT): Catelyn Joyner	SAMPLER SIGNATURE:	PWS I.D. #:
		Turn Around Time: Circle: 10 5 Days or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) HEX CR by 7196							COMMENTS
1) MW-26S	X			—	—	8-25-2020	1011	1011	GW	1	X							*All samples preserved on ice*
2) MW-26D	X			—	—	8-25-2020	1135	1135	GW	1	X							
3) MW-25S	X			—	—	8-25-2020	1245	1245	GW	1	X							
4) MW-25D	X			—	—	8-25-2020	1332	1332	GW	1	X							Report Group D
5)																		
6)																		
7)																		
8)																		
9)																		
10)																		

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
	8/25/2020 1405	Paul Love	8/25/20 1405
Paul Love	8/25/20 1605		8/25/20 1605

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 221 Custody Seals used and intact? (Y/N)

COOLER TEMP 2.5 °C Received on ice? (Y/N)

GA 20H1255
BPS: North East and West Ponds S
Recd: 08/25/2020 Due: 09/01/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

AIR WATER & SOIL LABORATORIES, INC.

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF __

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3Q20 Hexavalent Chromium
CONTACT: A. Reynolds M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804)-358-2900 EMAIL: areynolds@golder.com / martha_smith@golder.com		Pretreatment Program:
Is sample for compliance reporting? YES (NO)	**Regulatory State:** VA Is sample from a chlorinated supply? YES (NO)	PWS I.D. #:
SAMPLER NAME (PRINT): C. Joyner	SAMPLER SIGNATURE:	**Turn Around Time:** Circle: (10) 5 Days Standard or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Hexavalent Chromium (7196) (ICC)								COMMENTS
1) MW-27S	X		N			8/25/2020	1501	1501	GW	1	X								Reporting Group D - North Pond Sentinel
2)																			
3)																			
4)																			
5)																			
6)																			
7)					MT														
8)																			
9)																			
10)																			

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
	8/26/2020 0852	Cate Ruff	8/26/2020 0852
RELINQUISHED: Cate Ruff	DATE / TIME 8/26/2020 10:17	RECEIVED:	DATE / TIME 8/26/20 852
RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 777 COOLER TEMP 3.5 °C
Custody Seals used and intact? (Y) / N) Received on ice? (Y) / N)

GA 20H1288
BPS: North East and West Ponds
Recd: 08/26/2020 Due: 09/10/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

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4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

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5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

AIR WATER & SOIL LABORATORIES, INC.
1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3020 Hexavalent Chrom
CONTACT: A. Reynolds, M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave, Ste 200 Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900	EMAIL: areynolds@golder.com, martha-smith@golder.com	Pretreatment Program:
Is sample for compliance reporting? (YES) NO	**Regulatory State:** VA	Is sample from a chlorinated supply? YES (NO)
SAMPLER NAME (PRINT): M. Taylor	SAMPLER SIGNATURE: M. Taylor	**Turn Around Time:** Circle: (10) 5 Days or __ Day(s) standard

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Hexavalent Chromium (7196) / (ice)							
1) MW-28	X		N			8/26/2020	1010	1010	GW	1	X							
2)																		
3)																		
4)																		
5)					MT													
6)																		
7)																		
8)																		
9)																		
10)																		

COMMENTS

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

Reporting Group D - North Pond Sentinel

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
M. Taylor	8/26/2020 1405	Charlie Trent	8/26/20 2:05
Charlie Trent	8/26 4:21	CS	8/26/20 1621

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 177 **COOLER TEMP** 1.4 °C
Custody Seals used and intact? (Y / N)
Received on ice? (Y / N)

GA **20H1338**
BPS: North East and West Ponds S
Recd: 08/26/2020 Due: 09/10/2020

v130325002

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone then subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repealed to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples: 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 9/9/2020 2:50:51PM

Sample Conditions Checklist

Samples Received at:	**2.50°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

Work Order Comments

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 9/9/2020 2:50:51PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Sample Conditions Checklist

Samples Received at:	**3.50°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 9/9/2020 2:50:51PM

Sample Conditions Checklist

Samples Received at:	**1.40°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

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

September 28, 2020

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

RE: Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on August 24, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville
- Pace Analytical Services - Eden
- Pace Analytical Services - Greensburg

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.

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Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Pace Analytical Services Pennsylvania
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
Florida: Cert E871149 SEKS WET
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
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

Pace Analytical Services Asheville
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 Eden
205 East Meadow Road Suite A, Eden, NC 27288
North Carolina Drinking Water Certification #: 37738
North Carolina Wastewater Certification #: 633
Virginia/VELAP Certification #: 460025

REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492170001	**Field Blank**	Water	08/24/20 13:30	08/24/20 16:20

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

SAMPLE ANALYTE COUNT

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492170001	**Field Blank**	SM 2540C-2011	SOB	1	PASI-E
		EPA 6010D	SH1	16	PASI-A
		EPA 6020B	JOR	7	PASI-A
		EPA 7470A	SOO	1	PASI-A
		EPA 9315	LAL	1	PASI-PA
		EPA 9320	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
		EPA 350.1 Rev 2.0 1993	JKG	1	PASI-A
		EPA 9056A	BRJ	4	PASI-A

PASI-A = Pace Analytical Services - Asheville
PASI-E = Pace Analytical Services - Eden
PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492170001	**Field Blank**					
SM 2540C-2011	Total Dissolved Solids	27.0	mg/L	25.0	08/27/20 09:44	
EPA 6010D	Arsenic	4.9J	ug/L	10.0	09/01/20 04:03	
EPA 9315	Radium-226	0.119 ± 0.106 (0.189) C:84% T:NA	pCi/L		09/08/20 18:04	
EPA 9320	Radium-228	0.330 ± 0.384 (0.809) C:66% T:90%	pCi/L		09/11/20 11:45	
Total Radium Calculation	Total Radium	0.449 ± 0.490 (0.998)	pCi/L		09/14/20 14:03	

REPORT OF LABORATORY ANALYSIS

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

ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Sample: Field Blank **Lab ID: 92492170001** Collected: 08/24/20 13:30 Received: 08/24/20 16:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C-2011 Pace Analytical Services - Eden								
Total Dissolved Solids	**27.0**	mg/L	25.0	25.0	1		08/27/20 09:44		
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Antimony	ND	ug/L	5.0	3.0	1	08/30/20 17:58	09/01/20 04:03	7440-36-0	
Arsenic	**4.9J**	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:03	7440-38-2	
Barium	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:03	7440-39-3	
Beryllium	ND	ug/L	1.0	0.70	1	08/30/20 17:58	09/01/20 04:03	7440-41-7	
Boron	ND	ug/L	50.0	32.4	1	08/30/20 17:58	09/01/20 04:03	7440-42-8	
Cadmium	ND	ug/L	1.0	0.40	1	08/30/20 17:58	09/01/20 04:03	7440-43-9	
Calcium	ND	ug/L	100	94.2	1	08/30/20 17:58	09/01/20 04:03	7440-70-2	
Chromium	ND	ug/L	5.0	3.7	1	08/30/20 17:58	09/01/20 04:03	7440-47-3	
Copper	ND	ug/L	5.0	4.3	1	08/30/20 17:58	09/01/20 04:03	7440-50-8	
Molybdenum	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:03	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	08/30/20 17:58	09/01/20 04:03	7440-02-0	
Selenium	ND	ug/L	10.0	4.7	1	08/30/20 17:58	09/01/20 04:03	7782-49-2	
Silver	ND	ug/L	5.0	2.5	1	08/30/20 17:58	09/01/20 04:03	7440-22-4	
Hardness, Total(SM 2340B)	ND	ug/L	662	131	1	08/30/20 17:58	09/01/20 04:03		
Vanadium	ND	ug/L	5.0	3.9	1	08/30/20 17:58	09/01/20 04:03	7440-62-2	
Zinc	ND	ug/L	10.0	9.5	1	08/30/20 17:58	09/01/20 04:03	7440-66-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:49	7440-48-4	
Iron	ND	ug/L	50.0	20.9	1	08/28/20 01:18	08/31/20 22:49	7439-89-6	
Lead	ND	ug/L	0.10	0.077	1	08/28/20 01:18	08/31/20 22:49	7439-92-1	
Lithium	ND	ug/L	2.5	0.39	1	08/28/20 01:18	08/31/20 22:49	7439-93-2	
Manganese	ND	ug/L	0.50	0.47	1	08/28/20 01:18	08/31/20 22:49	7439-96-5	
Thallium	ND	ug/L	0.10	0.050	1	08/28/20 01:18	08/31/20 22:49	7440-28-0	
Tin	ND	ug/L	0.50	0.24	1	08/28/20 01:18	08/31/20 22:49	7440-31-5	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Pace Analytical Services - Asheville								
Mercury	ND	ug/L	0.20	0.12	1	08/25/20 16:14	08/26/20 13:21	7439-97-6	
350.1 Ammonia	Analytical Method: EPA 350.1 Rev 2.0 1993 Pace Analytical Services - Asheville								
Nitrogen, Ammonia	ND	mg/L	0.10	0.070	1		09/05/20 10:31	7664-41-7	
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	ND	mg/L	1.0	0.60	1		08/25/20 16:49	16887-00-6	
Fluoride	ND	mg/L	0.10	0.050	1		08/25/20 16:49	16984-48-8	
Nitrate as N	ND	mg/L	0.10	0.060	1		08/25/20 16:49	14797-55-8	

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ANALYTICAL RESULTS

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Sample: Field Blank **Lab ID: 92492170001** Collected: 08/24/20 13:30 Received: 08/24/20 16:20 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
9056 IC Anions 48hr	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Sulfate	ND	mg/L	1.0	0.50	1		08/25/20 16:49	14808-79-8	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 562744
QC Batch Method: SM 2540C-2011
Analysis Method: SM 2540C-2011
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Eden
Associated Lab Samples: 92492170001

METHOD BLANK: 2984270 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	25.0	25.0	08/27/20 09:38	

LABORATORY CONTROL SAMPLE: 2984271

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	250	236	94	90-110	

SAMPLE DUPLICATE: 2984272

Parameter	Units	92492617001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	347	336	3	25	

SAMPLE DUPLICATE: 2984273

Parameter	Units	92492363002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	428	408	5	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 562246
QC Batch Method: EPA 7470A
Analysis Method: EPA 7470A
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492170001

METHOD BLANK: 2982034 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.12	08/26/20 12:50	

LABORATORY CONTROL SAMPLE: 2982035

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.4	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2982036 2982037

Parameter	Units	92491985011 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	2.2	90	88	75-125	3	25	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 563337
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492170001

METHOD BLANK: 2986933 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Antimony	ug/L	ND	5.0	3.0	09/01/20 03:34	
Arsenic	ug/L	ND	10.0	4.7	09/01/20 03:34	
Barium	ug/L	ND	5.0	3.5	09/01/20 03:34	
Beryllium	ug/L	ND	1.0	0.70	09/01/20 03:34	
Boron	ug/L	ND	50.0	32.4	09/01/20 03:34	
Cadmium	ug/L	ND	1.0	0.40	09/01/20 03:34	
Calcium	ug/L	ND	100	94.2	09/01/20 03:34	
Chromium	ug/L	ND	5.0	3.7	09/01/20 03:34	
Copper	ug/L	ND	5.0	4.3	09/01/20 03:34	
Hardness, Total(SM 2340B)	ug/L	ND	662	131	09/01/20 03:34	
Molybdenum	ug/L	ND	5.0	3.9	09/01/20 03:34	
Nickel	ug/L	ND	5.0	3.5	09/01/20 03:34	
Selenium	ug/L	ND	10.0	4.7	09/01/20 03:34	
Silver	ug/L	ND	5.0	2.5	09/01/20 03:34	
Vanadium	ug/L	ND	5.0	3.9	09/01/20 03:34	
Zinc	ug/L	ND	10.0	9.5	09/01/20 03:34	

LABORATORY CONTROL SAMPLE: 2986934

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	500	505	101	80-120	
Arsenic	ug/L	500	507	101	80-120	
Barium	ug/L	500	511	102	80-120	
Beryllium	ug/L	500	519	104	80-120	
Boron	ug/L	500	494	99	80-120	
Cadmium	ug/L	500	506	101	80-120	
Calcium	ug/L	5000	5040	101	80-120	
Chromium	ug/L	500	506	101	80-120	
Copper	ug/L	500	517	103	80-120	
Hardness, Total(SM 2340B)	ug/L	33100	33100	100	80-120	
Molybdenum	ug/L	500	516	103	80-120	
Nickel	ug/L	500	511	102	80-120	
Selenium	ug/L	500	500	100	80-120	
Silver	ug/L	250	251	100	80-120	
Vanadium	ug/L	500	508	102	80-120	
Zinc	ug/L	500	492	98	80-120	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986935 2986936

Parameter	Units	92492846001 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	513	511	103	102	75-125	0	20	
Arsenic	ug/L	ND	500	500	531	536	106	107	75-125	1	20	
Barium	ug/L	14.4	500	500	534	531	104	103	75-125	1	20	
Beryllium	ug/L	ND	500	500	532	528	106	106	75-125	1	20	
Boron	ug/L	ND	500	500	526	525	104	104	75-125	0	20	
Cadmium	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Calcium	ug/L	2.9 mg/L	5000	5000	8130	8110	104	104	75-125	0	20	
Chromium	ug/L	ND	500	500	521	525	104	105	75-125	1	20	
Copper	ug/L	ND	500	500	524	523	104	104	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	15800	33100	33100	50000	50100	103	104	75-125	0		
Molybdenum	ug/L	ND	500	500	526	524	105	105	75-125	1	20	
Nickel	ug/L	ND	500	500	522	522	104	104	75-125	0	20	
Selenium	ug/L	ND	500	500	535	538	107	107	75-125	1	20	
Silver	ug/L	ND	250	250	258	258	103	103	75-125	0	20	
Vanadium	ug/L	ND	500	500	516	520	103	104	75-125	1	20	
Zinc	ug/L	ND	500	500	527	531	105	106	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986937 2986938

Parameter	Units	92492363002 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	518	515	104	103	75-125	1	20	
Arsenic	ug/L	7.7J	500	500	543	538	107	106	75-125	1	20	
Barium	ug/L	98.5	500	500	614	605	103	101	75-125	1	20	
Beryllium	ug/L	ND	500	500	531	518	106	104	75-125	3	20	
Boron	ug/L	0.21 mg/L	500	500	735	727	106	104	75-125	1	20	
Cadmium	ug/L	ND	500	500	524	515	105	103	75-125	2	20	
Calcium	ug/L	70.3 mg/L	5000	5000	74400	73200	82	56	75-125	2	20	M1
Chromium	ug/L	ND	500	500	512	498	102	100	75-125	3	20	
Copper	ug/L	ND	500	500	530	528	106	105	75-125	0	20	
Hardness, Total(SM 2340B)	ug/L	222000	33100	33100	252000	248000	93	80	75-125	2		
Molybdenum	ug/L	9.3	500	500	540	530	106	104	75-125	2	20	
Nickel	ug/L	ND	500	500	511	500	102	100	75-125	2	20	
Selenium	ug/L	5.3J	500	500	532	533	105	106	75-125	0	20	
Silver	ug/L	ND	250	250	258	253	103	101	75-125	2	20	
Vanadium	ug/L	ND	500	500	523	508	105	102	75-125	3	20	
Zinc	ug/L	ND	500	500	518	501	103	100	75-125	3	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492170001

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	08/31/20 22:26	
Iron	ug/L	ND	50.0	20.9	08/31/20 22:26	
Lead	ug/L	ND	0.10	0.077	08/31/20 22:26	
Lithium	ug/L	ND	2.5	0.39	08/31/20 22:26	
Manganese	ug/L	ND	0.50	0.47	08/31/20 22:26	
Thallium	ug/L	ND	0.10	0.050	08/31/20 22:26	
Tin	ug/L	ND	0.50	0.24	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	
Iron	ug/L	625	660	106	80-120	
Lead	ug/L	50	49.8	100	80-120	
Lithium	ug/L	50	47.3	95	80-120	
Manganese	ug/L	50	51.8	104	80-120	
Thallium	ug/L	10	10	100	80-120	
Tin	ug/L	50	50.5	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	61.9	10	10	76.5	73.6	146	118	75-125	4	20	M6
Iron	ug/L	17300	625	625	18700	18300	229	157	75-125	2	20	M6
Lead	ug/L	ND	50	50	49.2	50.3	98	101	75-125	2	20	
Lithium	ug/L	2.8	50	50	46.9	46.5	88	87	75-125	1	20	
Manganese	ug/L	3530	50	50	3800	3680	537	298	75-125	3	20	M6
Thallium	ug/L	ND	10	10	10	10.2	100	102	75-125	2	20	
Tin	ug/L	ND	50	50	50.5	51.0	101	102	75-125	1	20	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 564668
QC Batch Method: EPA 350.1 Rev 2.0 1993
Analysis Method: EPA 350.1 Rev 2.0 1993
Analysis Description: 350.1 Ammonia
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492170001

METHOD BLANK: 2993022 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Nitrogen, Ammonia	mg/L	ND	0.10	0.070	09/05/20 09:52	

LABORATORY CONTROL SAMPLE: 2993023

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Nitrogen, Ammonia	mg/L	5	4.9	98	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993024 2993025

Parameter	Units	92493815001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	ND	5	5	4.9	4.9	98	98	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993026 2993027

Parameter	Units	92493865003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Nitrogen, Ammonia	mg/L	3.8	5	5	8.5	8.5	95	96	90-110	0	10	

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QUALITY CONTROL DATA

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 562274
QC Batch Method: EPA 9056A
Analysis Method: EPA 9056A
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492170001

METHOD BLANK: 2982196 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	08/25/20 16:09	
Fluoride	mg/L	ND	0.10	0.050	08/25/20 16:09	
Nitrate as N	mg/L	ND	0.10	0.060	08/25/20 16:09	
Sulfate	mg/L	ND	1.0	0.50	08/25/20 16:09	

LABORATORY CONTROL SAMPLE: 2982197

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	47.6	95	90-110	
Fluoride	mg/L	2.5	2.5	98	90-110	
Nitrate as N	mg/L	2.5	2.3	93	90-110	
Sulfate	mg/L	50	48.0	96	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2982198 2982199

Parameter	Units	92492170001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	ND	50	50	49.3	48.6	99	97	90-110	1	10	
Fluoride	mg/L	ND	2.5	2.5	2.4	2.4	98	96	90-110	2	10	
Nitrate as N	mg/L	ND	2.5	2.5	2.4	2.4	97	95	90-110	1	10	
Sulfate	mg/L	ND	50	50	49.3	48.6	99	97	90-110	2	10	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Sample: Field Blank **Lab ID: 92492170001** Collected: 08/24/20 13:30 Received: 08/24/20 16:20 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
	Pace Analytical Services - Greensburg					
Radium-226	EPA 9315	**0.119 ± 0.106 (0.189) C:84% T:NA**	pCi/L	09/08/20 18:04	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 9320	**0.330 ± 0.384 (0.809) C:66% T:90%**	pCi/L	09/11/20 11:45	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.449 ± 0.490 (0.998)**	pCi/L	09/14/20 14:03	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 412359
QC Batch Method: EPA 9315
Analysis Method: EPA 9315
Analysis Description: 9315 Total Radium
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492170001

METHOD BLANK: 1994519 Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0753 ± 0.0856 (0.159) C:96% T:NA	pCi/L	09/08/20 17:44	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

QC Batch: 411839
QC Batch Method: EPA 9320
Analysis Method: EPA 9320
Analysis Description: 9320 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 92492170001

METHOD BLANK: 1992208
Matrix: Water
Associated Lab Samples: 92492170001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.627 ± 0.369 (0.668) C:69% T:83%	pCi/L	09/11/20 11:43	

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QUALIFIERS

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

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 (%)

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TNI - The NELAC Institute.

ANALYTE QUALIFIERS

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS 2SA20 (H)-Revised Report
Pace Project No.: 92492170

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492170001	**Field Blank**	SM 2540C-2011	562744		
92492170001	**Field Blank**	EPA 3010A	563337	EPA 6010D	563346
92492170001	**Field Blank**	EPA 3010A	562977	EPA 6020B	562996
92492170001	**Field Blank**	EPA 7470A	562246	EPA 7470A	562325
92492170001	**Field Blank**	EPA 9315	412359		
92492170001	**Field Blank**	EPA 9320	411839		
92492170001	**Field Blank**	Total Radium Calculation	413734		
92492170001	**Field Blank**	EPA 350.1 Rev 2.0 1993	564668		
92492170001	**Field Blank**	EPA 9056A	562274		

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CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorde
N

WO# : 92492170

92492170

ALL SHADED

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Modified Assessment	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): ~~M. Taylor / C. Joyner~~ MT J. England	Purchase Order # : 20139823 / Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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)

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	6010/6020 metals (B, Ca, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Ni, Mo, Se, Ag, Tl, Sn, V, Zn)	Mercury - 7470	9056 Anions (Chloride, Fluride, Sulfate, Nitrate)	SM2540 Total Dissolved Solids	SM2340B Hardness	350.1 Ammonia	9315 Radium-226	9320 Radium-228		
Field Blank	GW	G	8/24/2020	1330		MT	N	7	X	X	X	X	X	X	X	X		

Container Preservative Type

1	1	U	U	1	2	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 _____ (O1) Other 1 _____

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ✓ N NA
Custody Signatures Present ✓ N NA
Collector Signature Present ✓ N NA
Bottles Intact ✓ N NA
Correct Bottles ✓ N NA
Sufficient Volume ✓ N NA
Samples Received on Ice ✓ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ✓ N NA
Residual Chlorine Present Y ~~N~~ NA
Cl Strips: _____
Sample pH Acceptable ✓ NNA
pH Strips: _____
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492170

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group H for more details.	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 #: Samples received via: FEDEX UPS Client (Courier) Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 4.9 °C
Cooler 1 Therm Corr. Factor: 0.0 °C
Cooler 1 Corrected Temp: 4.9 °C
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	MTJL LAB USE ONLY
Golder	8/24/2020 1410		8/24/2020 2260	Table #:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Acctnum:
	8/24/2020 1620	Rachel Burress	8-24-20 1620	Template:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Prelogin:
				PM:
				PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: 1 of: 1

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, VA 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Analysis Detects Report

Date Issued:

Client Name:

Client Site ID:

Submitted To:

Laboratory Sample ID: **Client Sample ID:**

Parameter	Samp ID	Reference Method	Sample Results	Qual	DL	LOQ	Dil. Factor	Units

There are no reportable results for target analytes in this report.

Note that this report is not the "Certificate of Analysis". This report only lists the target analytes that displayed concentrations that exceeded the detection limit specified for that analyte. For a complete listing of all analytes requested and the results of the analysis see the " Certificate of Analysis".

AIR WATER & SOIL
an Enthalpy Analytical Laboratory
1941 Reymet Road ● Richmond, Virginia 23237 ● Tel: (804)-358-8295 Fax: (804)-358-8297

Certificate of Analysis

Final Report

Laboratory Order ID 20H1170

Client Name:	Golder Associates, Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	Date Received:	August 24, 2020 15:47
		Date Issued:	August 27, 2020 16:14
		Project Number:	20139823
Submitted To:	Amanda Reynolds	Purchase Order:	
Client Site I.D.:	Bremo Power Station		

Enclosed are the results of analyses for samples received by the laboratory on 08/24/2020 15:47. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Ted Soyars
Technical Director

End Notes:
The test results listed in this report relate only to the samples submitted to the laboratory and as received by the Laboratory.

Unless otherwise noted, the test results for solid materials are calculated on a wet weight basis. Analyses for pH, dissolved oxygen, temperature, residual chlorine and sulfite that are performed in the laboratory do not meet NELAC requirements due to extremely short holding times. These analyses should be performed in the field. The results of field analyses performed by the Sampler included in the Certificate of Analysis are done so at the client's request and are not included in the laboratory's fields of certification nor have they been audited for adherence to a reference method or procedure.

The signature on the final report certifies that these results conform to all applicable NELAC standards unless otherwise specified. For a complete list of the Laboratory's NELAC certified parameters please contact customer service.

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ACCREDITED IN ACCORDANCE WITH nelac
Commonwealth of Virginia, DCLS
Accreditation # 460021

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/27/2020 4:14:05PM

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Field Blank	20H1170-01	Ground Water	08/24/2020 13:30	08/24/2020 15:47

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Richmond, Virginia 23237
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(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Date Issued: 8/27/2020 4:14:05PM
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Client Sample ID: **Field Blank** **Laboratory Sample ID:** **20H1170-01**

Parameter	Samp ID	CAS	Reference Method	Sample Prep Date/Time	Analyzed Date/Time	Sample Results	Qual	DL	LOQ	DF	Units	Analyst
Wet Chemistry Analysis												
Chromium, Hexavalent	01	18540-29-9	SW7196A	08/25/2020 07:53	08/25/2020 11:00	BLOD	U	5	5	1	ug/L	MWL

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/27/2020 4:14:05PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Wet Chemistry Analysis - Quality Control

Air Water & Soil Laboratories, Inc.

Analyte	Result	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Qual
Batch BDH0793 - No Prep Wet Chem										
Blank (BDH0793-BLK1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	ND	5	ug/L							*U*
LCS (BDH0793-BS1)				Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	105	5	ug/L	100		105	80-120			
Matrix Spike (BDH0793-MS1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	96	5	ug/L	100	BLOD	96.0	80-120			
Matrix Spike Dup (BDH0793-MSD1)	**Source: 20H1170-01**			Prepared & Analyzed: 08/25/2020						
Chromium, Hexavalent	97	5	ug/L	100	BLOD	97.0	80-120	1.04	20	

Analytical Summary

Sample ID	Preparation Factors Initial / Final	Method	Batch ID	Sequence ID	Calibration ID
Wet Chemistry Analysis			**Preparation Method:**	**No Prep Wet Chem**	
20H1170-01	100 mL / 100 mL	SW7196A	BDH0793	SDH0707	AH00108

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/27/2020 4:14:05PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Certified Analyses included in this Report

Analyte	Certifications
SW7196A in Non-Potable Water	
Chromium, Hexavalent	VELAP

Code	Description	Laboratory ID	Expires
MdDOE	Maryland DE Drinking Water	341	12/31/2020
NC	North Carolina DENR	495	12/31/2020
NJDEP	New Jersey DEP	VA015	06/30/2021
NYDOH	New York DOH Drinking Water	12096	04/01/2021
PADEP	NELAC-Pennsylvania Certificate #005	68-03503	10/31/2020
VELAP	NELAC-Virginia Certificate #10886	460021	06/14/2021
WVDEP	West Virginia DEP	350	11/30/2020

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Certificate of Analysis

Client Name: Golder Associates, Inc.

Date Issued: 8/27/2020 4:14:05PM

Client Site I.D.: Bremo Power Station

Submitted To: Amanda Reynolds

Qualifiers and Definitions

U	Analyte was not detected and is reported as less than the DL or as defined by the client. The DL has been adjusted for any dilution or concentration of the sample.
RPD	Relative Percent Difference
Qual	Qualifers
-RE	Denotes sample was re-analyzed
LOD	Limit of Detection
BLOD	Below Limit of Detection
LOQ	Limit of Quantitation
DF	Dilution Factor
TIC	Tentatively Identified Compounds are compounds that are identified by comparing the analyte mass spectral pattern with the NIST spectral library. A TIC spectral match is reported when the pattern is at least 75% consistent with the published pattern. Compound concentrations are estimated and are calculated using an internal standard response factor of 1.
PCBs, Total	Total PCBs are defined as the sum of detected Aroclors 1016, 1221, 1232, 1248, 1254, 1260, 1262, and 1268.

AIR WATER & SOIL LABORATORIES, INC.

1941 REYMET ROAD
RICHMOND, VIRGINIA 23237
(804) 358-8295 PHONE
(804)358-8297 FAX

Chain of Custody
Effective: Nov 15, 2018

CHAIN OF CUSTODY

PAGE 1 OF 1

COMPANY NAME: Golder Associates	INVOICE TO: Accounts Payable	PROJECT NAME/Quote #: 3Q20 Hexavalent Chromium
CONTACT: A. Reynolds M. Williams	INVOICE CONTACT:	SITE NAME: Bremo Power Station
ADDRESS: 2108 W. Laburnum Ave., Richmond, VA 23227	INVOICE ADDRESS:	PROJECT NUMBER: 20139823
PHONE #: (804) 358-7900	INVOICE PHONE #:	P.O. #:
FAX #: (804) 358-2900 EMAIL: amanda-reynolds@golder.com		Pretreatment Program:
Is sample for compliance reporting? (YES) NO	Regulatory State: VA	Is sample from a chlorinated supply? YES (NO) PWS I.D. #:
SAMPLER NAME (PRINT): J. England	SAMPLER SIGNATURE:	Turn Around Time: Circle: (10) 5 Days standard or __ Day(s)

Matrix Codes: WW=Waste Water/Storm Water GW=Ground Water DW=Drinking Water S=Soil/Solids OR=Organic A=Air WP=Wipe OT=Other_____

	CLIENT SAMPLE I.D.	Grab	Composite	Field Filtered (Dissolved Metals)	Composite Start Date	Composite Start Time	Grab Date or Composite Stop Date	Grab Time or Composite Stop Time	Time Preserved	Matrix (See Codes)	Number of Containers	ANALYSIS / (PRESERVATIVE) Hexavalent Chromium (7196)							
1)	Field Blank	X		N			8/24/2020	1330	1330	GW	1	X							
2)																			
3)																			
4)																			
5)						MT													
6)																			
7)																			
8)																			
9)																			
10)																			

Preservative Codes: N=Nitric Acid C=Hydrochloric Acid S=Sulfuric Acid H=Sodium Hydroxide A=Ascorbic Acid Z=Zinc Acetate T=Sodium Thiosulfate M=Methanol

COMMENTS

PLEASE NOTE PRESERVATIVE(S), INTERFERENCE CHECKS or PUMP RATE (L/min)

*all bottles preserved on ice *

Reporting Group H - Field Blank

RELINQUISHED:	DATE / TIME	RECEIVED:	DATE / TIME
[signature]	8/24/2020 1440	[signature]	8/24/2020 2:20
[signature]	8/24/2020 3:47	[signature]	8/24/20 1547

QC Data Package
Level III ☐
Level IV ☐
Level II

LAB USE ONLY Therm ID: 271 COOLER TEMP 6.0 °C
Custody Seals used and intact? (Y)/ N) Received on ice? (Y)/ N)

GA 20H1170
BPS: North East and West Ponds
Recd: 08/24/2020 Due: 09/08/2020

v130325002

v181115.xls

TERMS & CONDITIONS

Where a purchaser (Client) places an order for laboratory, consulting or sampling services from Air Water & Soil Laboratories, Inc., a Virginia corporation (referred to as "Air Water & Soil "), Air Water & Soil shall provide the ordered services pursuant to these Terms and Conditions, and the related Quotation or Price Schedule, or as agreed in a negotiated contract. In the absence of a written agreement to the contrary, the Order constitutes an acceptance by the Client of Air Water & Soil's offer to do business under these Terms and Conditions and an agreement to be bound by these Terms and Conditions. No contrary or additional terms and conditions expressed in a Client's document shall be deemed to become a part of the contract created upon acceptance of these Terms and Conditions, unless accepted by Air Water & Soil in writing.

1. ORDERS AND RECEIPT OF SAMPLES

1.1 The Client may place the Order (i.e., specify a Scope of Work) either by submitting a purchase order to Air Water & Soil in writing or by telephone (hon subsequently confirmed in writing, or by negotiated contract (i.e. Chain of Custody). Whichever option the Client selects for placing the Order, the Order shall not be valid unless it contains sufficient specification to enable Air Water & Soil to carry out the Client's requirements. In particular, samples must be accompanied by: a) adequate instruction on type of analysis requested and b) complete written disclosure of the known or suspected presence of any hazardous substances, as defined by applicable federal or state law. Where any samples which were not accompanied by the required disclosure, cause interruptions in the lab's ability to process work due to contamination of instruments or work areas, the Client will be responsible for the costs of clean up and recovery. If the sample time is not provided, then laboratory must use the most conservative time (midnight of the date provided).

1.2 The Client shall provide one week's advance notice of the sample delivery schedule, or any changes to the schedule, whenever possible. Upon timely delivery of samples, Air Water & Soil will use its best efforts to meet mutually agreed turnaround times. All turnaround times are based on business days and will be calculated from the point in time when Air Water & Soil has determined that it can proceed with defined work following receipt, inspection of samples and resolution of any discrepancies in Chain-of-Custody forms and project guidance regarding work to be done (Sample Delivery Acceptance). In the event of any changes in the sample delivery schedule by the Client, prior to Sample Delivery Acceptance, Air Water & Soil reserves the right to modify its turnaround time commitment, to change the date upon which Air Water & Soil will accept samples or refuse Sample Delivery Acceptance for the affected samples.

1.2.1 Turn around times are defined as follows: Any sample group requiring a turnaround time of less than five(5) business days will be considered a "Rush Turn Around Time". Rush Turnaround samples received after 3:00pm will be considered as received on the next business day.

1.2.2 Air Water & Soil defines "standard turnaround" as Five (5) business days.

1.3 Air Water & Soil reserves the right, exercisable at any time, to refuse or revoke Sample Delivery Acceptance for any sample which in the sole judgment of Air Water & Soil: a) is of unsuitable volume; b) may pose a risk or become unsuitable for handling, transport, or processing for any health, safety, environmental or other reason, whether or not due to the presence in the sample of any hazardous substance and whether or not such presence has been disclosed to Air Water & Soil by the Client; or c) holding times cannot be met, due to passage of more than 48 hours from the time of sampling or 1/2 the holding time for the requested test, whichever is less.

1.4 Prior to Sample Delivery Acceptance, the entire risk of loss or damage to samples remains with the Client, except where Air Water & Soil provides courier services. In no event will Air Water & Soil have any responsibility or liability for the action or inaction of any carrier shipping or delivering any sample to or from Air Water & Soil's premises. The Client is responsible for assuring that any sample containing any hazardous substance, which is to be delivered to Air Water & Soil's premises, will be packaged, labeled, transported and delivered properly and in accordance with applicable laws.

2. PAYMENT TERMS

2.1 Services performed by Air Water & Soil will be in accordance with prices quoted and later confirmed in writing or as stated in the Price Schedule. Quoted prices do not include sales tax. Applicable sales tax will be added to invoices where required by law. An Environmental Management Fee of 5% of the invoice value will also be applied, at Air Water & Soil's discretion.

2.2 Invoices may be submitted to the Client upon completion of any sample delivery group. Billing corrections must be requested within 30 days of invoice date. Payment in advance is required for all Clients except those whose credit has been established with Air Water & Soil. For Clients with approved credit, payment terms are net 30 days from the date of invoice by Air Water & Soil. All overdue payments are subject to an additional interest and service charge of one and one half percent (1.5%) (or the maximum rate permissible by law, whichever is lesser) per month or portion thereof from the due date until the date of payment. All fees are charged or billed directly to the Client. The billing of a third party will not be accepted without a statement, signed by the third party, which acknowledges and accepts payment responsibility.

2.3 Air Water & Soil may suspend work and withhold delivery of data under this order at any time in the event the Client fails to make timely payment of its invoices. The Client shall be responsible for all costs and expenses of collection including reasonable attorney's fees. Air Water & Soil reserves the right to refuse to proceed with work at any time based upon an unfavorable Client credit report.

3. CHANGE ORDERS, TERMINATION

3.1 Changes to the Scope of Work, price or result delivery date may be initiated by Air Water & Soil after Sample Delivery Acceptance due to any condition which conflicts with analytical, QA or other protocols warranted in these Terms and Conditions. Air Water & Soil will not proceed with such changes until an agreement with the Client is reached, and documented, on the amount of any cost, schedule change or technical change to the Scope of Work. Email communications are acceptable, telephone conversations however must be followed up with written documentation.

3.2 Changes to the Scope of Work, including but not limited to increasing or decreasing the work, changing test and analysis specification or acceleration in the performance of the work, may be initiated by the Client after Sample Delivery Acceptance. Such a change will be documented in writing and may result in a change in cost and turnaround time commitment. Air Water & Soil's acceptance of such changes is contingent upon technical feasibility and operational capacity.

3.3 Suspension or termination of all or any part of the work may be initiated by the Client. Air Water & Soil will be compensated consistent with Section 2 of these Terms and Conditions. Air Water & Soil will complete all work in progress and be paid in full for all work completed.

4. WARRANTIES AND LIABILITY

4.1 Where applicable, Air Water & Soil will use analytical methodologies which are in substantial conformity with published test methods; these methods have been implemented in Air Water & Soil's Laboratory Quality Manual and referenced Standard Operating Procedures. Air Water & Soil reserves the right to deviate from these methodologies, based on its reasonable judgment, as necessary or appropriate where the nature or composition of the sample requires it. The deviations, if any, will be made on a basis consistent with recognized standards of the industry and/or Air Water & Soil's Laboratory Quality Manuals. The Client may request that Air Water & Soil perform according to a mutually agreed Quality Assurance Project Plan (QAPP). In the event that samples arrive prior to agreement on a QAPP, Air Water & Soil will proceed with analyses under its standard Quality Manuals then in effect, and Air Water & Soil will not be responsible for any re-sampling or other charges if work must be repeated to comply with a subsequently finalized QAPP.

4.2 Air Water & Soil shall start preparation and/or analysis within holding times provided that Sample Delivery Acceptance occurs within 48 hours of sampling or 1/2 of the holding time for the test, whichever is less. Where resolution of inconsistencies leading to Sample Delivery Acceptance does not occur within this period, Air Water & Soil will use its best efforts to meet holding times and will proceed with the work provided that, in Air Water & Soil's judgment, the chain-of-custody or definition of the Scope of Work provide sufficient guidance. Reanalysis of samples to comply with Air Water & Soil's Quality Manuals will be deemed to have met holding times provided the initial analysis was performed within the applicable holding time. Where reanalysis demonstrates that sample matrix interference is the cause of failure to meet any Quality Manual requirements, the warranty will be deemed to have been met.

4.3 Air Water & Soil warrants that it possesses and maintains all licenses and certifications which are required to perform services under these Terms and Conditions, provided that such requirements are specified in writing to Air Water & Soil prior to Sample Delivery Acceptance.

4.4 The warranty obligations set forth in Sections 4.1, 4.2 and 4.3 are the sole and exclusive warranties given by Air Water & Soil in connection with any services performed by Air Water & Soil or any Results generated from such services; Air Water & Soil gives and makes NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. No representative of Air Water & Soil is authorized to give or make any other representation or warranty or modify this warranty in any way.

4.5 The Client's sole and exclusive remedy for the breach of warranty in connection with any services performed by Air Water & Soil, will be limited to repeating any services performed; contingent on the Client's providing, at the request of Air Water & Soil and at the Client's expense, additional sample(s) if necessary. Any reanalysis requested by the Client generating Results consistent with the original Results will be at the Client's expense. If re-sampling is necessary, Air Water & Soil's liability for re-sampling costs will be limited to actual cost or one hundred and fifty dollars ($150) per sample, whichever is less.

4.6 Air Water & Soil's liability for any and all causes of action arising hereunder, whether based in contract, tort, warranty, negligence or otherwise, shall be limited to the lesser amount of compensation for the services performed or $100,000. All claims, including those for negligence, shall be deemed waived unless suit thereon is filed within one year after Air Water & Soil's completion of the services. Under no circumstances, whether arising in contract, tort (including negligence), or otherwise, shall Air Water & Soil be responsible for loss of use, loss of profits, or for any special, indirect, incidental or consequential damages occasioned by the services performed or by application or use of the reports prepared.

4.7 In no event shall Air Water & Soil have any responsibility or liability to the Client for any failure or delay in performance by Air Water & Soil which results, directly or indirectly, in whole or in part, from any cause or circumstance beyond the reasonable control of Air Water & Soil. Such causes and circumstances shall include, but not be limited to, acts of God, acts of Client, acts or orders of any governmental authority, strikes or other labor disputes, natural disasters, accidents, wars, civil disturbances, equipment breakdown, matrix interference or unknown highly contaminated samples that impact instrument operation, unavailability of supplies from usual suppliers, difficulties or delays in transportation, mail or delivery services, or any other cause beyond Air Water & Soil's reasonable control.

5. RESULTS, WORK PRODUCT

5.1 Data or information provided to Air Water & Soil or generated by services performed under this agreement shall only become the property of the Client upon receipt in full by Air Water & Soil of payment for the whole Order. Ownership of any analytical method, QA/QC protocols, software programs or equipment developed by Air Water & Soil for performance of work will be retained by Air Water & Soil, and the Client shall not disclose such information to any third party.

5.2 Data and sample materials provided by the Client, or at the Client's request, and the result obtained by Air Water & Soil shall be held in confidence (unless such information is generally available to the public or is in the public domain or the Client has failed to pay Air Water & Soil for all services rendered or is otherwise in breach of these Terms and Conditions), subject to any disclosure required by law or legal process.

5.3 Should the Results delivered by Air Water & Soil be used by the Client or the Client's client, even though subsequently determined not to meet the warranties described in these Terms and Conditions, then the compensation will be adjusted based upon mutual agreement. In no case shall the Client unreasonably withhold Air Water & Soil's right to independently defend its data.

5.4 Air Water & Soil reserves the right to subcontract services ordered by the Client to another laboratory or laboratories, if, in Air Water & Soil's sole judgment, it is reasonably necessary, appropriate or advisable to do so. Air Water & Soil will in no way be liable for any subcontracted services except for work performed at laboratories which have been audited and approved by Air Water & Soil.

5.5 Air Water & Soil shall dispose of the Client's samples 30 days after receipt of samples; 15 days after receipt of samples for BOD, CBOD and TSS analyses, unless instructed to store them for an alternate period of time or to return such samples to the Client, in a manner consistent with U.S. Environmental Protection Agency regulations or other applicable federal, state or local requirements. Any samples for projects that are canceled or not accepted, or for which return was requested, will be returned to the Client at his own expense. Air Water & Soil reserves the right to return to the Client any sample or unused portion of a sample that is not within Air Water & Soil's permitted capability or the capabilities of Air Water & Soil's designated waste disposal vendor(s).

5.6 Unless a different time period is agreed to in any order under these Terms and Conditions, Air Water & Soil agrees to retain all records for five (5) years.

5.7 In the event that Air Water & Soil is required to respond to legal process related to services for the Client, the Client agrees to reimburse Air Water & Soil for hourly charges for personnel involved in the response and attorney fees reasonably incurred in obtaining advice concerning the response, preparation to testify, and appearances related to the legal process, travel and all reasonable expenses associated with the litigation.

6. INSURANCE

6.1 Air Water & Soil shall maintain in force during the performance of services under these Terms and Conditions, Workers' Compensation and Employer's Liability Insurance in accordance with the laws of the states having jurisdiction over Air Water & Soil's employees, who are engaged in the performance of the work. Air Water & Soil shall also maintain during such period, Comprehensive General and Contractual Liability (limit of $1,000,000 per occurrence/ $2,000,000 aggregate), Comprehensive Automobile Liability, owned and hired, ($1,000,000 combined single limit), and Professional/Pollution Liability Insurance (limit of $1,000,000 per occurrence/aggregate).

7. AUDIT

7.1 Upon prior notice to Air Water & Soil, the Client may audit and inspect Air Water & Soil's records and accounts covering reimbursable costs related to work done for the Client, for a period of two (2) years after completion of the work. The purpose of any such audit shall be only for verification of such costs, and Air Water & Soil shall not be required to provide access to cost records where prices are expressed as fixed fees or published unit prices.

8. MISCELLANEOUS PROVISIONS

8.1 These Terms and Conditions, together with any additions or revisions which may be agreed to in writing by Air Water & Soil, embody the whole agreement of the parties and provide the only remedies available. There are no promises, terms, conditions, understandings, obligations or agreements other than those contained herein; these Terms and Conditions shall supersede all previous communications, representations, or agreements, either verbal or written, between the Client and Air Water & Soil. These Terms and Conditions, and any transactions or agreements to which they apply, shall be governed both as to interpretation and performance by the laws of the state where Air Water & Soil's services are performed.

8.2 The invalidity or unenforceability, in whole or in part of any provision, term or condition hereof shall not affect in any way the validity or enforceability of the remainder to these Terms and Conditions, the intent of the parties being that the provisions be severable. The section headings of these Terms and Conditions are intended solely for convenient reference and shall not define, limit or affect in any way these Terms and Conditions or their interpretations. No waiver by either party of any provision, term or condition hereof or of any obligation of the other party hereunder shall constitute a waiver of any subsequent breach or other obligation.

8.3 The obligations, liabilities, and remedies of the parties, as provided herein, are exclusive and in lieu of any others available at law or in equity. Indemnifications, releases from liability and limitations of liability shall apply, notwithstanding the fault, negligence or strict liability of the party to be indemnified, released, or whose liability is limited, the extent of sole negligence or willful misconduct.

ENTHALPY ANALYTICAL
formerly Air, Water & Soil Laboratories

Enthalpy Analytical
1941 Reymet Road
Richmond, Virginia 23237
(804)-358-8295 - Telephone
(804)-358-8297 - Fax

Certificate of Analysis

Client Name: Golder Associates, Inc.
Client Site I.D.: Bremo Power Station
Submitted To: Amanda Reynolds

Date Issued: 8/27/2020 4:14:05PM

Sample Conditions Checklist

Samples Received at:	**6.00°C**
How were samples received?	ent Provided Courier
Were Custody Seals used? If so, were they received intact?	Yes
Are the custody papers filled out completely and correctly?	Yes
Do all bottle labels agree with custody papers?	Yes
Is the temperature blank or representative sample within acceptable limits or received on ice, and recently taken?	Yes
Are all samples within holding time for requested laboratory tests?	Yes
Is a sufficient amount of sample provided to perform the tests included?	Yes
Are all samples in appropriate containers for the analyses requested?	Yes
Were volatile organic containers received?	No
Are all volatile organic and TOX containers free of headspace?	NA
Is a trip blank provided for each VOC sample set? VOC sample sets include EPA8011, EPA504, EPA8260, EPA624, EPA8015 GRO, EPA8021, EPA524, and RSK-175.	NA
Are all samples received appropriately preserved? Note that metals containers do not require field preservation but lab preservation may delay analysis.	Yes

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

October 07, 2020

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

RE: Project: Bremo PS NP Verification
Pace Project No.: 92498413

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on October 01, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville

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

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

CERTIFICATIONS

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Pace Analytical Services Asheville
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

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Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92498413001	**MW-24**	Water	09/30/20 15:21	10/01/20 09:55

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Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92498413001	**MW-24**	EPA 6020B	JOR	1	PASI-A

PASI-A = Pace Analytical Services - Asheville

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Huntersville, NC 28078
(704)875-9092

SUMMARY OF DETECTION

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92498413001	**MW-24**					
EPA 6020B	Cobalt	57.8	ug/L	1.0	10/06/20 13:09	

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

ANALYTICAL RESULTS

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Sample: MW-24 **Lab ID: 92498413001** Collected: 09/30/20 15:21 Received: 10/01/20 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 Pace Analytical Services - Asheville								
Cobalt	**57.8**	ug/L	1.0	0.50	10	10/06/20 01:04	10/06/20 13:09	7440-48-4	

REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: Bremo PS NP Verification
Pace Project No.: 92498413

QC Batch: 571063
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92498413001

METHOD BLANK: 3024750 Matrix: Water
Associated Lab Samples: 92498413001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	10/06/20 12:16	

LABORATORY CONTROL SAMPLE: 3024751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.3	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3024752 3024753

Parameter	Units	92498413001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	57.8	10	10	67.1	68.4	92	106	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

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Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: Bremo PS NP Verification
Pace Project No.: 92498413

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.

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS NP Verification
Pace Project No.: 92498413

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92498413001	**MW-24**	EPA 3010A	571063	EPA 6020B	571081

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workc

WO# : 92498413

ALL SHADE

92498413

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: ~~Possum Point Power Station~~ MT Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Verification	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [X] Yes [ ] No
Collected By (print): C. Joyner	Purchase Order # : 20139823 Quote #: / DW PWS ID #: DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply) / Field Filtered (if applicable): [ ] Yes [X] No / Analysis: _____

Container Preservative Type: 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 _____ (O1) Other 1_____

* 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)

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	Analyses: 6020 Cobalt	Lab Profile/Line:
MW-24	GW	Grab	9-30-2020	1521			N	1	X	*all bottles preserved on ice*

Lab Profile/Line:

Lab Sample Receipt Checklist:
- Custody Seals Present/Intact: ~~N~~ N NA
- Custody Signatures Present: ~~N~~ N NA
- Collector Signature Present: ~~N~~ N NA
- Bottles Intact: ~~N~~ N NA
- Correct Bottles: ~~N~~ N NA
- Sufficient Volume: ~~N~~ N NA
- Samples Received on Ice: ~~N~~ N NA
- VOA - Headspace Acceptable: Y N ~~NA~~
- USDA Regulated Soils: Y N ~~NA~~
- Samples in Holding Time: ~~N~~ N NA
- Residual Chlorine Present: Y N ~~NA~~
- Cl Strips: _____
- Sample pH Acceptable: ~~N~~ N NA
- pH Strips: 232518V
- Sulfide Present: Y N ~~NA~~
- Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92498413

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, reporting group A for more details.

North Pond Verification

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 2.1 oC
Cooler 1 Therm Corr. Factor: +0.1 oC
Cooler 1 Corrected Temp: 2.2 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Joyner (Golder)	10-1-2020/0955		10-1-20 7:55
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: 1 of: 1

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

October 07, 2020

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

RE: Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on October 01, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville

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.

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

CERTIFICATIONS

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

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

SAMPLE SUMMARY

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92498415001	**MW-28**	Water	09/30/20 14:45	10/01/20 09:55

REPORT OF LABORATORY ANALYSIS

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

SAMPLE ANALYTE COUNT

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92498415001	**MW-28**	EPA 6020B	JOR	1	PASI-A

PASI-A = Pace Analytical Services - Asheville

REPORT OF LABORATORY ANALYSIS

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

SUMMARY OF DETECTION

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92498415001	**MW-28**					
EPA 6020B	Lithium	1.4J	ug/L	2.5	10/06/20 12:46	

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

ANALYTICAL RESULTS

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Sample: MW-28 **Lab ID: 92498415001** Collected: 09/30/20 14:45 Received: 10/01/20 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 Pace Analytical Services - Asheville								
Lithium	**1.4J**	ug/L	2.5	0.39	1	10/06/20 01:04	10/06/20 12:46	7439-93-2	

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

QUALITY CONTROL DATA

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

QC Batch: 571063
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92498415001

METHOD BLANK: 3024750 Matrix: Water
Associated Lab Samples: 92498415001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Lithium	ug/L	ND	2.5	0.39	10/06/20 12:16	

LABORATORY CONTROL SAMPLE: 3024751

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Lithium	ug/L	50	51.8	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3024752 3024753

Parameter	Units	92498413001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lithium	ug/L	2.1J	50	50	49.1	49.4	94	95	75-125	1	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.

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

QUALIFIERS

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

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.

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS P Sentinel Verif.
Pace Project No.: 92498415

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92498415001	**MW-28**	EPA 3010A	571063	EPA 6020B	571081

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder M

WO# : 92498415

92498415

ALL SHADED A

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: ~~Possum Point Power Station~~ MT Bremo Power Station
Customer Project Name/Number: Bremo 2SA2020 Verification	State: VA / County/City: Bremo Bluff [ ]PT [ ]MT [ ]CT [X]ET Time Zone Collected:
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station
Collected By (print): M. Taylor	Purchase Order # : 20139823 Quote #:
Collected By (signature): M. Taylor	Turnaround Date Required: Standard
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited Charges Apply)

Compliance Monitoring? [X] Yes [ ] No

DW PWS ID #:

DW Location Code:

Immediately Packed on Ice: [X] Yes [ ] No

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

** 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 _____ (O1) Other 1_____

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	Analyses: 6020 Lithium
MW-28	GW	Grab	9-30-2020	1445			N	1	X

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ~~N~~ N NA
Custody Signatures Present ~~N~~ N NA
Collector Signature Present ~~N~~ N NA
Bottles Intact ~~N~~ N NA
Correct Bottles ~~N~~ N NA
Sufficient Volume ~~N~~ N NA
Samples Received on Ice ~~N~~ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ~~N~~ N NA
Residual Chlorine Present Y N ~~NA~~
Cl Strips: _____
Sample pH Acceptable ~~N~~ N NA
pH Strips: 232518V
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92498415 001

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, reporting group B for more details.

North Pond Sentinel Verification

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 2.1 oC
Cooler 1 Therm Corr. Factor: +0.1 oC
Cooler 1 Corrected Temp: 2.2 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Taylor (Golder)	10-1-2020/0955		10-1-20 9:55
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: 1 of: 1

Appendix B

Field Data Sheets - Second-Semi Annual Monitoring Event (August 2020)

Date: 8-24-2020

GOLDER

WELL GAUGING LOG

Project Name: Bremo – 2SA2020 NP Compliance Project No./Task No.: 20139823.100A

Sampler(s): M. Taylor, ~~J. England~~ MT

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	MT	1022	28.21		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-29S	MT	1137	40.82		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-29D	MT	1136	43.00		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-24	MT	1059	79.52		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-25S	MT	1109	44.82		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-25D	MT	1106	44.90		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-26S	MT	1114	53.80		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-26D	MT	1117	53.41		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-27S	MT	1034	41.23		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-27D	MT	1037	39.86		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-28	MT	1030	39.51		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-33	MT	1043	92.60		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-34	MT	1047	94.25		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-35	MT	1055	91.24		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-36S	MT	1018	16.81		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
MW-36D	MT	1016	10.85		OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged
					OK Damaged	OK Damaged	OK Inadequate	Yes No	OK Damaged

Observations/Notes: _____

Signature: M. Taylor Date: 8-24-2020

QA/QC Signature: John England Date: 8-24-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8/24/2020
Weather: Sunny 80s

Project Name: Bromo
Project No./Task No.: 20139823
Event: 2SA2020 GW
Sampler(s): J. England
Well ID: MW-11
Field Calibration Completed: 8/24/2020 @ 1155
Well Diameter: 2.0 inches
Initial Depth to Water: 28.25 feet
Depth to Bottom: 51.95 feet
Water Column Thickness: 23.70 feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI —
- [ ] 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
- [ ] Aquatech 500 SN: 750148

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
1213	5.52	194.26	2.31	4.62	16.71	179.3	29.31	300
1218	7.78	201.51	4.51	8.60	22.10	158.4	29.50	275
1223	8.03	207.71	0.99	8.48	20.43	175.0	29.54 29.44	275
1228	8.08	214.85	0.78	8.46	19.94	178.3	29.50	275
1232	8.10	214.71	0.45	8.43	19.71	180.7	29.51	275
1238	8.07	215.16	0.45	8.41	18.98	181.6	29.51	275
1240	— SAMPLED							
1256	7.90	205.09	7.17	7.64	21.30	171.6	29.84	275

Purge Cycle (End): 26/4 seconds @ 34 psi
Flow Rate (ml/min End): ~275 ml/min
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~0.30 Gal
Total Purge Volume (Gallons): ~3.5
Purge Water Management: on site Containment
Purge Observations (color, odor, turbidity, sheen): purge time 1205 / Clear grab Sample

Sample Time: 1240
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: See Golder Sample Memo dated: 7/31/2020

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 8/24/2020
QA/QC Signature: M Foyle Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020

Weather: sun, 80s

Project Name: Bremo P.S.

Project No./Task No.: 20139823

Event: 2SA20 CCR+VSWMR/3Q20 Cr6+ GW

Sampler(s): M. Taylor

Well ID: MW-29S

Field Calibration Completed: 0830 8-25-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 40.90 feet

Depth to Bottom: 74.58 feet

Water Column Thickness: 33.68 feet

Equipment Used:
- [X] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI —
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ AquaTroll 600 542080
- [ ] 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
1000	5.41	247.49	11.01	5.75	15.77	221.0	41.49	400
1003	5.40	247.98	9.82	5.75	15.62	217.6	42.00	400
1006	5.40	248.89	9.43	5.72	15.67	221.4	42.09	400
1009	5.40	248.71	7.82	5.73	15.54	222.3	42.05	400
1010	—	Sampled	—	—	—	—	—	—
1021	5.38	249.52	7.03	5.71	15.71	225.0	41.80	400

Purge Cycle (End): 21/9 seconds @ 40 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): (65.40)(0.006) = 0.39

Total Purge Volume (Gallons): ~2.5

Purge Water Management: Onsite polytank

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

Purge start: 0950

Sample Time: 1010

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: Cr^{6+}, see Golder sample memo dated 7-31-2020 for analytes - Reporting Group B: MW-29S/D BKG

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor

Date: 8-25-2020

Page 1 of 1

QA/QC Signature:

Date: 8-28-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-25-2020
Weather: Sun, 80s

Project Name: Bremo P.S.
Project No./Task No.: 20139823
Event: 2SA20 CCR+ VSWMR/3Q20 Cr6+ GW
Sampler(s): M. Taylor
Well ID: MW-29D
Field Calibration Completed: 0830 8-25-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 43.03 feet
Depth to Bottom: 161.75 feet
Water Column Thickness: 118.72 feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI
- [x] In-Situ AquaTroll 600 5420 80
- [ ] 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
1049	7.01	810.14	1.61	2.12	16.47	-61.8	50.52	300
1052	7.02	825.14	6.34	1.91	16.37	-63.4	52.03	300
1055	6.99	685.41	3.40	2.55	16.34	-63.0	54.60	300
1058	6.95	763.43	3.10	2.37	16.59	-64.6	55.49	300
1101	6.94	776.49	0.97	2.24	16.72	-64.8	56.32	300
1104	6.93	751.22	2.59	2.22	16.78	-65.8	57.84	300
1105	sampled							
1115	6.92	743.36	3.81	2.47	16.94	-67.0	56.05	300

Purge Cycle (End): ~~20/10~~ 11/9 seconds @ 50 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): (159.38')(0.006)=~0.95
Total Purge Volume (Gallons): ~2.5
Purge Water Management: onsite polytank
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge start: 1038
Sample Time: 1105
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 → Reporting Group B: MW-29S/D BKG
- [x] Other: Cr6+, see Golder 2SA20 CCR+ VSWMR GW sample memo dated 7-31-2020 for analytes

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor Date: 8-25-2020
QA/QC Signature: Date: 8-29-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-24-2020, 8-25-2020
Weather: mostly sunny, 90s, sun, 90s

Project Name: Bremo P.S.
Project No./Task No.: 20139823
Event: 2SA20 CCR+VSWMR - NAP
Sampler(s): M. Taylor
Well ID: MW-24 3020 Cr6+ GW
Field Calibration Completed: 1155 8-24-2020, 0830 8-25-2020
Well Diameter: 2.0 inches
Initial Depth to Water: 79.51 8-24-2020 feet
Depth to Bottom: 155.35 feet
Water Column Thickness: 75.84 feet

Equipment Used:
- [X] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI _____
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ Aqua-Troll 600 542080
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [X] Aquatroll 500 750176

Date

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
8/24/2020 1255	6.20	957.18	14.10	2.41	18.01	20.1	81.93	300
1258	6.24	945.75	60.43	1.27	17.46	-2.0	82.71	275
1301	6.24	940.96	38.47	1.14	17.14	-10.2	83.51	275
1304	6.23	940.72	57.15	1.06	17.17	-8.0	83.92	275
1307	6.21	917.96	231.79	1.26	16.98	-13.9	84.44	275
1308	pause to QC turbidity readings							
1320	6.24	863.69	7.90	2.18	19.09	-17.8	82.95	275
~~1325~~ 1323	6.27	739.12	19.26	1.30	17.62	-24.8	83.78	275
1326	6.29	752.81	27.94	1.13	17.33	-26.9	84.72	200
1329	6.29	667.97	84.95	1.02	17.42	-27.7	85.29	200
1332	6.27	666.11	291.43	1.07	17.19	~~-240~~ -240	85.92	200
1335	6.23	565.12	60.15	1.12	17.06	-15.2	86.40	200
1338	6.21	691.60	27.23	1.61	16.91	-10.1	86.91	300
1341	6.20	642.70	24.94	1.47	17.01	-7.0	87.16	300
1344	6.19	643.44	39.00	1.22	16.87	-5.3	87.40	200
1347	6.18	645.83	105.29	1.49	16.70	-3.7	87.85	200
* 1350	6.17	605.29	141.81	1.46	17.03	0.0	88.19	200 *

Purge Cycle (End): 20/10 seconds @ 65 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): (148.55')(0.006) = 0.89 gal
Total Purge Volume (Gallons): ~6.5
Purge Water Management: onsite polytank
Purge Observations (color, odor, turbidity, sheen): clear grab sample
Purge start: 8-24-2020 1245, 1205 8-25-2020
Sample Time: 1230 8-25-2020
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: Reporting Group C - North Pond Compliance see Golder sample memos dated July 31, 2020 for compliance analytes, Cr6+, Alkalinity as CaCO3, Mg, Ca, K

Other Observations / Equipment Operation Problems:
* MS/MSD taken here *, * pause sampling at 1350 *

Sampler Signature: M. Taylor Date: ~~8-24-2020~~ 8/25/2020 Page 1 of 2
QA/QC Signature: Date: 8-28-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-24-2020, 8-25-2020
Weather: sun, 90s, sun 90s

Project Name: Bremo P.S. | Project No./Task No.: 20139823
Event: 2SA20 CCR+VSWMR, 3020 Hex Chrome NAP | Sampler(s): M. Taylor
Well ID: MW-24 | Field Calibration Completed: 1155 8-24-2020, 0830 8-25-2020
Well Diameter: 2.0 inches | Initial Depth to Water: 79.51 8-24-2020 feet
Depth to Bottom: 155.35 feet | Water Column Thickness: 75.84 feet

Equipment Used:
- [x] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [ ] YSI ____
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [x] In-Situ Aquatroll 600 540080
- [ ] MP-10 Controller Box
- [x] MP-15 Controller Box
- [x] AquaTroll 500 750176

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
~~1503~~ mr 1509	6.32	645.39	14.61	1.00	17.40	-24.1	83.29	200
1512	6.31	615.18	29.41	1.14	17.66	-20.2	83.77	200
1215	6.16	616.06	0.89	2.80	18.33	-3.9	81.21	300
1218	6.03	765.96	3.14	1.91	17.86	-14.4	82.10	300
1221	6.06	675.14	3.61	1.83	17.84	-12.3	82.92	300
1224	6.06	660.22	4.17	1.86	17.66	-8.4	83.39	300
1227	6.08	658.03	0.22	1.79	17.39	-4.0	84.20	300
1230	sampled							
1258	6.09	710.23	2.15	2.04	17.69	-11.3	83.51	300

Date: 8-24-2020 / 8-25-2020

Purge Cycle (End): 2 o/o seconds @ 65 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): ~0.89
Total Purge Volume (Gallons): ~6.5 | Purge Water Management: Onsite containment - polytank
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge start: 1245 8-24-2020, 1205 8-25-2020
Sample Time: 1230 8-25-2020 | 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: see page 1 of 2

Other Observations / Equipment Operation Problems: *MS/MSD sampled here* (North Pond)
pause sampling at 1513 8-24-2020, resume 8-25-2020 1204 [due to malfunctioning water quality m

Sampler Signature: M. Taylor | Date: 8-25-2020 | Page 2 of 2
QA/QC Signature: [signature] | Date: 8-28-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020

Weather: sunny

Project Name: Bremo P.S. | Project No./Task No.: 20139823

Event: 2SA2020 NAP Sentinel | Sampler(s): C. Joyner

Well ID: MW-255 | Field Calibration Completed: 8-25-2020 @ 0700

Well Diameter: 2 inches | Initial Depth to Water: 44.85 feet

Depth to Bottom: 98.80 feet | Water Column Thickness: 53.95 feet

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

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

☐ In-Situ Aqua Troll 500 ☐ MP-10 Controller Box ☒ 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
1231	6.25	429.47	4.66	1.07	16.33	30.6	47.49	400
1234	6.25	407.43	3.01	0.79	16.65	31.2	48.82	400
1237	6.07	401.39	2.95	0.63	16.75	51.2	50.05	400
1240	5.99	398.89	4.40	0.62	16.76	56.9	51.70	400
1243	5.97	396.23	6.32	0.55	16.27	59.2	52.63	400
1245				SAMPLE				
1258	6.02	391.05	10.81	0.73	16.60	51.4	54.40	400

Purge Cycle (End): 23/7 seconds @ 70 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): ~0.53

Total Purge Volume (Gallons): ~2 | Purge Water Management: On site containment

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

purge time 1226

Sample Time: 1245 | 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: see sample memo dated 7-31-2020 NAP Sentinel

Other Observations / Equipment Operation Problems: DTP = 89.90

Sampler Signature: [signature] Date: 8-25-2020 Page 1 of 1

QA/QC Signature: [signature] Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020
Weather: Sun 80s

Project Name: Bremo P.S.
Project No./Task No.: 20134823
Event: 25A2020 NAP Sentinel
Sampler(s): CJ + MW
Well ID: MW-25D
Field Calibration Completed: 8-25-2020 @ 0700
Well Diameter: 2 inches
Initial Depth to Water: 45.00 feet
Depth to Bottom: 157.40 feet
Water Column Thickness: 112.40 feet

Equipment Used:
- [x] WL Indicator
- [x] Turbidity Meter
- [ ] Air Tank
- [x] Dedicated Bladder Pump
- [ ] YSI _____
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [x] In-Situ Aqua Troll 500
- [ ] 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
1321	6.25	284.56	37.1	0.53	15.94	10.8	45.50	400
1324	6.26	286.80	8.88	0.48	16.02	6.1	45.32	400
1327	6.27	285.55	5.65	0.46	16.03	4.9	45.42	400
1330	6.29	280.77	4.07	0.45	16.80	4.7	45.21	400
1332				SAMPLE				
1343	6.27	293.33	5.80	0.59	15.78	18.0	45.12	400

Purge Cycle (End): 2317 seconds @ 65 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): slow grab sample
purge time 1313
Sample Time: 1332
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: See sample mem o Sentinel/NAP 7-31-2020

Other Observations / Equipment Operation Problems: DTP = 150.55'

Sampler Signature: _____ Date: 8-25-2020
QA/QC Signature: M. Taylor Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020
Weather: Sun 80s

Project Name: Bremo P.S.
Project No./Task No.: 20139823
Event: 2SA2020 NAP Sentinel
Sampler(s): C. Joyner
Well ID: MW-265
Field Calibration Completed: 8-25-2020 @ 0700
Well Diameter: 2 inches
Initial Depth to Water: 53.84 feet
Depth to Bottom: 110.59 feet
Water Column Thickness: 56.75 feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI —
- [ ] In-Situ Aqua Troll 500
- [ ] 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
0954	5.70	127.96	3.69	7.99	16.67	260.9	54.41	350
0957	5.84	125.75	11.25	8.22	16.62	276.0	54.25	350
1000	5.79	122.09	16.02	8.10	16.47	266.6	54.42	350
1003	5.86	122.15	10.82	7.70	16.45	275.5	54.21	350
1006	5.89	120.90	17.71	7.22	16.40	284.5	54.40	350
1009	5.90	120.09	10.91	7.18	16.42	281.6	54.43	350
1011	—	—	—	SAMPLE	—	—	—	—
1027	5.82	114.96	15.21	7.22	17.03	284.8	54.20	350

Purge Cycle (End): 20/10 seconds @ 50 psi
Flow Rate (ml/min End): 350
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): 20.62
Total Purge Volume (Gallons): ~2.5
Purge Water Management: onsite containment
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge time 0950
Sample Time: 1011
Field Filtered (0.45um): [x] 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: See Sample memo Report group D Sentinel 7-31-20

Other Observations / Equipment Operation Problems: PTP=103.21

Sampler Signature: [signature] Date: 8-25-2020
QA/QC Signature: M. Joyner Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 7-25-2020
Weather: Sun 80s

Project Name: Bruno P.S.
Project No./Task No.: 20139823
Event: 25A2020 NAP Sentinel
Sampler(s): C. Joyner
Well ID: MW-26D
Field Calibration Completed: 8-25-2020 @ 0700
Well Diameter: 2 inches
Initial Depth to Water: 53.45 feet
Depth to Bottom: 141.70 feet
Water Column Thickness: 88.25 feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI —
- [x] In-Situ AquaTroll 500
- [x] 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
1059	6.55	446.89	15.99	2.16	19.33	-20.1	53.97	200
1103	6.58	434.46	36.89	2.17	18.50	-18.8	53.98	200
1108	6.61	433.80	44.60	2.12	19.80	-17.9	54.12	200
1113	6.59	433.87	59.08	2.19	20.69	-18.6	54.05	200
1118	6.60	432.24	62.20	2.13	20.82	-16.1	53.75	100
1123	6.62	430.15	81.04	2.19	21.05	-23.6	54.00	100
1128	6.64	435.12	90.94	2.12	21.01	-27.9	54.05	100
1133	6.65	423.46	5.02	2.19	21.18	-30.1	53.81	100
1135				SAMPLE				
1206	6.58	425.45	3.88	2.71	19.34	-10.6	54.15	100

Purge Cycle (End): 50/10 seconds @ 50 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): 70.80
Total Purge Volume (Gallons): ~2.5
Purge Water Management: on-site containment
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge time 1043
Sample Time: 1135
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: see sample memo Report Group P Sentinel 7-31-2020

Other Observations / Equipment Operation Problems: DTP = 133.31
change from 20/10 cycle to 50/10 cycle @ 1115 started using Turbidity meter at 1131

Sampler Signature: [signature] Date: 8-25-2020
QA/QC Signature: M. Joyce Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020
Weather: Sun 80s

Project Name: Bremo PIS
Project No./Task No.: 20199823
Event: 2SA2020 NAP Sentinel
Sampler(s): C. Taylor
Well ID: MW-27S
Field Calibration Completed: 8-25-2020 @ 0700
Well Diameter: 2 inches
Initial Depth to Water: 41.39 feet
Depth to Bottom: 90.13 feet
Water Column Thickness: 48.74 feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ AquaTroll 500
- [ ] 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
1450	6.35	912.37	13.83	0.96	17.08	80.0	41.50	400
1453	6.20	879.89	6.41	0.62	17.03	48.1	41.44	400
1456	6.12	883.55	4.92	0.54	16.07	102.7	41.56	400
1459	6.11	873.03	7.30	0.51	16.74	100.5	41.59	400
1501	—	—	—	SAMPLE	—	—	—	—
1516	6.10	883.32	1.45	0.79	17.50	158.6	41.62	400

Purge Cycle (End): 23/7 seconds @ 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): ~0.48
Total Purge Volume (Gallons): ~2
Purge Water Management: onsite containment
Purge Observations (color, odor, turbidity, sheen): Clear gas sample
purge time 1446
Sample Time: 1501
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: see sample memo dated 7-31-2020 NAP sentinel

Other Observations / Equipment Operation Problems: DTP = 80.93

Sampler Signature: [signature] Date: 8-25-2020
QA/QC Signature: M. Taylor Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020

Weather: sun 80s

Project Name: Bremo P.S. | Project No./Task No.: 20139823

Event: 2SA2020 NAP Comp | Sampler(s): C. Joyner

Well ID: MW-270 | Field Calibration Completed: 8-25-2020 @0700

Well Diameter: 2 inches | Initial Depth to Water: 34.90 feet

Depth to Bottom: >200 ft feet | Water Column Thickness: — feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI —
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ Aqua Troll 500
- [ ] 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
1537	6.24	1269.1	5.25	0.53	16.85	16.9 lcs	48.71	400
1540	6.19	1255.6	6.13	0.50	16.95	26.9 lcs	50.15	400
1543	6.16	1241.3	13.52	0.51	17.01	28.9 lcs	52.45	400
1546	6.14	1237.0	10.81	0.45	17.66	35.5	53.80	400
1548	—	—	—	SAMPLE	—	—	—	—
1620	6.34	1200.4	12.48	0.50	18.69	96.0	68.98	400

Purge Cycle (End): 18/12 seconds @ 110 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): ~1.2

Total Purge Volume (Gallons): ~2 | Purge Water Management: on site containment

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

purge time 1526

Sample Time: 1548 | 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: See sample memo 7-31-2020 NAP Comp

Other Observations / Equipment Operation Problems: DTP = >200 ft

Sampler Signature: [signature] | Date: 8-25-2020 | Page 1 of 1

QA/QC Signature: M. Joyner | Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-26-2020

Weather: Sun, 80s

Project Name: Bremo P.S. | Project No./Task No.: 20139823

Event: 2SA20 CCR+VSWMR NAP, 3Q20 Cr6+ | Sampler(s): M. Taylor

Well ID: mw-28 | Field Calibration Completed: 0830 8-26-2020

Well Diameter: 2.0 inches | Initial Depth to Water: 38.57 feet

Depth to Bottom: 69.27 feet | Water Column Thickness: 30.70 feet

Equipment Used:
- [X] WL Indicator
- [ ] YSI
- [X] In-Situ AquaTroll 600 542080
- [X] 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
0950	5.76	587.93	86.9	1.45	17.80	201.1	39.73	300
0953	5.95	560.47	82.7	1.31	16.83	206.7	39.81	300
0956	5.97	568.91	43.5	1.08	16.29	209.8	39.96	300
0959	6.09	577.85	20.7	0.91	15.62	202.9	40.13	300
1002	6.19	553.65	7.98	0.84	15.61	199.9	40.20	300
1005	6.23	567.22	8.39	0.81	15.49	197.4	40.24	300
1008	6.26	565.49	7.20	0.77	15.41	195.1	40.34	300
1010		SAMPLED						
1023	6.31	573.53	6.18	0.90	16.22	190.6	40.30	300

Purge Cycle (End): 25/5 seconds @ 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): (60.98)(0.006)= 0.365g

Total Purge Volume (Gallons): ~2 | Purge Water Management: onsite polytank

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

purge start: 0940

Sample Time: 1010 | 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: see Golder sample memo dated 7-31-2020 for 2SA20 VSWMR+ CCR analytes, Cr6+

Other Observations / Equipment Operation Problems: Reporting Group D - North Pond Sentinel

Sampler Signature: MJoyce | Date: 8-26-2020 | Page 1 of

QA/QC Signature: [signature] | Date: 8-28-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-25-2020, 8-27-2020
Weather: Sun, 90s

Project Name: Bremo P.S. | Project No./Task No.: 20139823
Event: 2SA20 CCR+VSWMR 3Q20 Cr6+ | Sampler(s): M. Taylor
Well ID: MW-33 | Field Calibration Completed: 0830 8/25/2020, 0840 8-27-2020
Well Diameter: 2.0 inches | Initial Depth to Water: 92.60 / 92.61 feet
Depth to Bottom: 134.22 feet | Water Column Thickness: 41.62 feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI _____
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ Aquatroll 600 542080
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [ ] _____

Date	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
8-25-2020	1624	6.41	652.77	1.19	3.56	19.68	56.7	97.51	150
	1627	6.43	638.21	2.51	3.83	19.77	60.9	98.81	150
	1630	6.44	623.11	3.63	4.39	19.89	66.3	99.24	150
	1633	6.46	612.44	3.94	4.76	19.76	69.8	99.90	150
	1636	6.47	608.17	3.71	4.82	19.74	72.1	99.73	150
	1637	SAMPLED							
	1722	6.52	599.86	2.23	4.51	23.92	87.1	105.92	150
8-27-2020	0953	6.50	610.13	3.81	4.73	21.62	93.4	96.22	150
	0956	6.45	604.71	1.93	4.98	20.19	90.7	96.69	150
	0959	6.49	613.78	2.20	4.84	20.34	85.4	97.22	150
	1000	SAMPLED							
	1012	6.54	619.22	3.29	4.39	20.78	82.1	98.94	150

Purge Cycle (End): 11.5/8.5 seconds @ 90 psi | Flow Rate (ml/min End): ~150
Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): (129.60)(0.006) = ~0.77
Total Purge Volume (Gallons): ~~1.75~~ ~3 | Purge Water Management: onsite polytank
Purge Observations (color, odor, turbidity, sheen): clear grab sample
Purge start: 1558 8-25-2020, 0936 8-27-2020
Sample Time: 1637 8-25-2020, 1000 for nitrates 8-27-2020 | 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: See Golder sample memo dated 7-31-2020 Reporting Group C - NP compliance

Other Observations / Equipment Operation Problems:
8-27-2020 - resample for Nitrates, 1005 8-27-2020 change air tank

Sampler Signature: M. Taylor | Date: ~~8-25-2020~~ 8-27-2020 | Page 1 of 1
QA/QC Signature: | Date: 8-28-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-24-2020 / 8-25-2020 / 8-27-2020
Weather: sun, 90s / sun, 90s / sun 80s

Project Name: Bremo P.S. Project No./Task No.: 20139823
Event: 2SA20 CCR+ VSWMR NAP GW + 3Q20 Cr6+ Sampler(s): M. Taylor
Well ID: MW-34 Field Calibration Completed: 1155 8/24/2020 / 0830 8/25/2020 / 0830 8-27-2020
Well Diameter: 2.0 inches Initial Depth to Water: 8/24/2020 94.24 / 8/25/2020 94.20 feet 8-27-2020 94.22
Depth to Bottom: 154.45 feet Water Column Thickness: 60.21 feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI ~
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ AquaTroll 600 542080
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [X] AquaTroll 500 751076

Date	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
8-24-2020	1539	6.11	332.46	27.78	1.14	17.76	289.1	94.73	300
	1542	6.10	353.15	3.85	1.54	15.75	356.7	94.69	300
	1545	6.00	372.11	9.51	1.17	12.19	414.9	94.75	300
	1548	5.98	326.04	10.25	0.87	17.14	435.9	94.69	300
	1551	5.95	326.12	14.00	0.83	17.46	449.9	94.70	300
	1554	5.92	324.57	15.54	0.79	17.37	457.2	94.71	300
	1557	5.94	335.56	18.70	0.96	18.92	455.1	94.72	200
	1600	6.00	338.19	22.32	1.30	19.56	435.1	94.64	200
	1605	6.07	334.70	38.86	1.55	18.82	460.1	94.62	200
	1608	6.08	333.90	42.86	1.43	18.35	466.3	94.60	200
	1611	6.12	322.88	126.83	1.15	17.23	475.3	94.71	400
	1614	6.10	319.69	233.86	1.04	16.95	480.3	94.32	400
8-25-2020	~~1617~~ MT 1450	6.11	363.71	0.00	1.02	16.98	448.7	94.71	400
	1453	6.06	362.75	0.00	0.86	16.97	509.7	94.93	400
	1456	6.13	378.33	2.73	1.62	17.04	502.1	94.40	400
	1510	6.14	379.20	2.84	1.89	17.21	508.5	94.51	400
	1513	6.14	381.17	3.01	1.73	17.30	510.2	94.66	400

Purge Cycle (End): 20/10 seconds @ 70 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): (148.15')(0.006) = ~0.88 gal.
Total Purge Volume (Gallons): ~5 Purge Water Management: onsite poly tank
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge start: 8/24/2020 1530, 8/25/2020 1441, 0933 8-27-2020
Sample Time: 1520 8-25-2020, 0953 8-27-2020 for nitrate 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: see Golder sample memo dated 7-31-2020 Cr6+ (Na, Mg, K, Alkalinity) ↳ Reporting Group C - NP compliance

Other Observations / Equipment Operation Problems:
pause readings 8-24-2020 1614 - turbidity readings may be inaccurate
change air tank 1602 8-24-2020

Sampler Signature: M. Taylor Date: 8-25-2020 Page 1 of 2
QA/QC Signature: Date: 8-28-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-24-2020 / 8-25-2020

Weather: sun, 90s / sun, 90s

Project Name: Bremo P.S. | Project No./Task No.: 20139823

Event: see pg. 1 | Sampler(s): M. Taylor 8-27-20

Well ID: MW-34 | Field Calibration Completed: 1155 8/24/2020, 0830 8/25/2020, 0845

Well Diameter: 2.0 inches | Initial Depth to Water: (8-24-2020) 94.24, (8-25-2020) 94.20, (8-27-2020) 94.22 feet

Depth to Bottom: 154.45 feet | Water Column Thickness: 60.21 feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [X] Dedicated Bladder Pump
- [ ] YSI _____
- [ ] Peristaltic Pump
- [ ] Compressor
- [ ] Non-dedicated BP
- [X] In-Situ AquaTroll 524080
- [ ] MP-10 Controller Box
- [X] MP-15 Controller Box
- [X] AquaTroll 500 S/N 710976

Date 8-25-2020 / 8-27-2020

Time (5 minute int.)	pH (S.U.)	Sp. Cond. (uS/cm)^{oC}	Turbidity (NTU)	Dissolved Oxygen (mg/L)	Temp. ($^{\circ}$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
1516	6.16	383.90	2.67	1.56	17.34	514.1	~~96~~ 94.96	400
1520		SAMPLED						
1535	6.20	388.21	3.89	1.38	17.85	516.0	94.50	400
0942	5.99	416.11	3.28	0.90	16.28	510.1	94.76	400
0945	5.97	415.84	2.27	0.88	16.15	518.3	94.52	400
0948	5.92	413.21	1.81	0.81	16.08	519.1	94.72	400
0951	5.93	410.87	3.47	0.75	16.18	520.0	94.68	400
0953				SAMPLE FOR NITRATE				
0956	5.92	409.09	2.84	0.75	16.10	521.8	94.85	400

Purge Cycle (End): 20/10 seconds @ 70 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): ~0.88

Total Purge Volume (Gallons): ~5 | Purge Water Management: onsite polytank

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

purge start: 1530 8-24-2020, 1441 8-25-2020, 0933 on 8-27-2020

Sample Time: 1520 8-25-2020, 0953 8-27-2020 nitrates | 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: See pg. 1

Other Observations / Equipment Operation Problems: Additional Nitrate bottle filled 8-27-2020 @ 0953

Additional Readings to confirm representative sample

Sampler Signature: M. Taylor | Date: 8-25-2020

QA/QC Signature: [signature] | Date: 8-28-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8/24/2020

Weather: Sunny 80s

Project Name: Bremo

Project No./Task No.: 20139823

Event: 2SA2020

Sampler(s): J. England

Well ID: MW-3S

Field Calibration Completed: 8/24/2020 @ 1155

Well Diameter: 2.0 inches

Initial Depth to Water: 105.16 feet

Depth to Bottom: 136.04 feet

Water Column Thickness: 30.88 feet

Equipment Used:
- [x] WL Indicator
- [ ] YSI ____
- [ ] In-Situ ____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [ ] MP-15 Controller Box
- [x] Dedicated Bladder Pump
- [ ] Non-dedicated BP
- [x] AquaTroll S/N: 750148

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
~~1530~~ 1540	6.36	403.67	479.83	1.54	22.92	-6.6	105.31	200
1545	6.35	402.64	468.90	1.61	23.69	-2.0	105.33	200
1550	6.32	402.37	460.10	2.14	25.79	-1.1	105.34	200
1555	6.38	323.63	304.77	1.63	18.21	-20.1	105.34	200
1600	6.41	289.56	340.11	0.43	17.59	-27.7	105.42	200
1605	6.47	395.71	107.52	0.60	16.74	-42.2	105.44	200
1610	6.55	398.32	21.66	0.35	16.51	-55.7	105.50	200
1615	6.60	405.64	10.02	0.32	16.49	-61.8	105.53	200
1620	6.64	402.02	9.87	0.31	16.40	-64.0	105.58	200
1625	6.66	403.82	9.94	0.29	16.49	-64.4	105.62	200
1630			SAMPLED					
1640	6.56	405.02	6.84	1.00	18.37	-49.6	106.10	200

Purge Cycle (End): 23/7 seconds @ 90 psi Flow Rate (ml/min End): ~1.0

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): ~20

Total Purge Volume (Gallons): ~5.0 Purge Water Management: on site containers

Purge Observations (color, odor, turbidity, sheen): Purge time: 1520

1551 - charged air tank / Collect grab samples

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: See Golder Sample Menu date 7/31/2020

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 8/24/2020

QA/QC Signature: M. Hyde Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-25-2020
Weather: Sun 80s

Project Name: Bruno P.S.
Project No./Task No.: 20139823
Event: 25A2020 NAP COMP
Sampler(s): C. Joyner
Well ID: NAP-Duplicate
Field Calibration Completed: 8-25-2020 @ 0700
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)°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
1610	—	—	—	SAMPLE	—	—	—	—

Purge Cycle (End): — seconds @ — 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 Managemen t: —
Purge Observations (color, odor, turbidity, sheen): Clear grab sample taken at MW-27D See MW-27D sampling log for details

Sample Time: 1610
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: see sample memo 7-31-2020 NAP COMP

Other Observations / Equipment Operation Problems:

Sampler Signature: [signature] Date: 8-25-2020
QA/QC Signature: M. Joyner Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8/24/2020

Weather: Sunny 80s

Project Name: Bremo

Project No./Task No.: 20139823

Event: 2SA 2020 GW (CCR+VSWMR)

Sampler(s): J. England

Well ID: Field Blank

Field Calibration Completed: 8/24/2020 @ 1155

Well Diameter: — inches

Initial Depth to Water: ~~28.25~~ No Water Level 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) °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 —	SAMPLED							

Purge Cycle (End): — seconds @ — 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 with lab provided DI Water near MW-11

Sample Time: 1330

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: See Golder Sample Memo date: 7/31/2020

Other Observations / Equipment Operation Problems:

Sampler Signature: John England Date: 8/24/2020

QA/QC Signature: M. Hayes Date: 8-31-2020

Appendix C

Field Data Sheets - NES Sampling - Groundwater (August 2020)

Date: 8-24-2020

GOLDER

WELL GAUGING LOG

Project Name: Bremo P.S. - NP NES ACM

Project No./Task No.: 20139823.8000.1

Sampler(s): M.Taylor, J.England

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-22D	JE	1046	29.60		☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-23D	JE	1056	30.04		☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-36S	MT	1018	16.81		☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-36D	MT	1016	10.85		☒ OK ☐ Damaged	☒ OK ☐ Damaged	☒ OK ☐ Inadequate	☒ Yes ☐ No	☒ OK ☐ Damaged
MW-UPPES	JE	1121	18.49		☒ 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
					☐ 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: M. Taylor

Date: 8-24-2020

QA/QC Signature: _____

Date: 8/31/2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-28-2020

Weather: Sunny

Project Name: Bremo P.S. | Project No./Task No.: 20139823

Event: NES-ACM | Sampler(s): L. Joyner

Well ID: MW-22D | Field Calibration Completed: 8-28-2020 @ 0940

Well Diameter: 2 inches | Initial Depth to Water: 30.43 feet

Depth to Bottom: 117.73 feet | Water Column Thickness: 87.30 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI Pro DSS / 18L104612
- [ ] In-Situ ____
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [ ] Dedicated Bladder Pump
- [x] 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
1105	7.44	1.2	13.02	7.10	34.2	19.9	30.82	~150
1110	7.63	584	20.65	7.63	~~348.6~~ 20.8	~~320.8~~ -98.6	31.00	150
1115	7.32	611	17.98	2.70	20.0	-95.4	31.11	150
1120	7.29	608	20.34	1.54	19.8	-111.0	30.92	150
1125	7.31	615	19.19	1.71	19.8	-122.5	31.02	150
1130	7.31	618	18.54	1.11	19.5	-124.9	31.05	150
1135	7.27	623	18.27	1.19	19.8	-127.8	31.02	150
1140	7.21	625	18.06	0.71	19.5	-127.4	31.04	150
1142				SAMPLE				
1150	7.21	636	19.21	2.90	20.0	-125.0	30.97	150

Purge Cycle (End): 52/8 seconds @ 90 psi | Flow Rate (ml/min End): 150

Purge volume (gallons) prior to stabilization monitoring (3/8" I.D. Tube: Vol=Depth to Pump x 0.006 gal/ft): 20.52

Total Purge Volume (Gallons): ~1.5 | Purge Water Management: On site containment

Purge Observations (color, odor, turbidity, sheen): Clear grab sample purge time 1103

Sample Time: 1142 | 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: SEE sample memo dated 7-31-2020 NES-AC

Other Observations / Equipment Operation Problems: PTP = 102.22

Sampler Signature: _____ Date: 8-28-2020 Page 1 of 1

QA/QC Signature: M. Joyce Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-28-2020
Weather: 54n 80s

Project Name: Bremo P.S.
Project No./Task No.: 20139823
Event: NES-ALM
Sampler(s): C. Joyner
Well ID: MW-23D
Field Calibration Completed: 8-28-2020 @ 0940
Well Diameter: 2 inches
Initial Depth to Water: 30.09 feet
Depth to Bottom: 102.80 feet
Water Column Thickness: 72.71 feet

Equipment Used:
- [X] WL Indicator
- [X] YSI PRODSS 19L104642
- [ ] In-Situ —
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [X] MP-15 Controller Box
- [ ] Dedicated Bladder Pump
- [X] 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
0931	6.99	679	27.81	4.24	23.2	151.8	30.19	125
0936	7.18	486.7	38.42	6.17	20.5	-38.49	31.94	125
0941	7.21	486.8	37.57	1.77	19.8	-72.9	33.23	125
0946	7.19	486.4	29.51	1.14	19.8	-85.0	34.34	125
0951	7.14	486.1	24.60	1.01	19.9	-86.2	35.59	125
0956	7.11	485.9	20.34	1.04	19.9	-85.6	36.95	125
1001	7.07	486.6	19.69	0.75	20.5	-85.3	37.54	125
1006	7.07	485.7	17.53	0.82	23.4	-87.5	38.63	125
1011	7.14	487.0	14.79	0.66	21.3	-96.7	39.54	125
1016	7.16	486.9	13.59	0.61	21.0	-101.7	40.40	125
1021	7.13	486.7	10.82	0.61	21.7	-101.2	41.84	125
1023	—	—	—	SAMPLE	—	—	—	—
1030	7.14	485.2	11.42	0.54	17.7	-100.1	44.19	125

Purge Cycle (End): 50/10 seconds @ 80 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): ~0.57
Total Purge Volume (Gallons): 22
Purge Water Management: Onsite containment
Purge Observations (color, odor, turbidity, sheen): clear grab sample
purge time 0925
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: see sample memo dated 7-31-2020 NES-ACM

Other Observations / Equipment Operation Problems: DTP = 94.20'
change N2 air @ 1004

Sampler Signature: [signature] Date: 8-28-2020
QA/QC Signature: M. Joyce Date: 8-31-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-27-2020
Weather: Sun 90s

Project Name: Bremo P.S.
Project No./Task No.: 20139823
Event: NES-ACM
Sampler(s): C. Joyner
Well ID: MW-36S
Field Calibration Completed: 8-27-2020 @ 0840
Well Diameter: 2 inches
Initial Depth to Water: 16.92 feet
Depth to Bottom: 31.03 feet
Water Column Thickness: 14.11 feet

Equipment Used:
- [X] WL Indicator
- [X] Turbidity Meter
- [ ] Air Tank
- [ ] Dedicated Bladder Pump
- [ ] YSI
- [ ] Peristaltic Pump
- [ ] Compressor
- [X] Non-dedicated BP
- [X] In-Situ Aqua Troll 500
- [ ] 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
1514	6.58	519.20	17.99	3.91	27.86	238.6	17.12	200
1517	6.48	529.01	14.11	0.99	22.53	233.5	17.13	200
1520	6.30	526.11	22.0	0.56	20.96	237.1	17.39	200
1523	6.13	524.33	24.2	0.44	21.57	243.1	17.20	~~200~~ 175
1526	6.01	524.05	22.5	0.87	22.82	250.7	17.22	175
1529	5.91	518.50	26.5	1.10	23.00	258.0	17.34	175
1532	5.82	517.43	27.2	0.73	22.97	264.5	17.18	175
1535	5.76	511.88	26.7	0.67	22.80	267.0	17.22	175
1538	5.72	506.78	25.2	0.60	22.62	269.5	17.25	175
1541	5.67	504.23	25.6	0.50	22.35	272.5	17.30	175
1543				SAMPLE				
1551	5.64	498.22	25.7	0.53	23.29	276.0	17.19	175

Purge Cycle (End): 56 / 14 seconds @ 25 psi Flow Rate (ml/min End): 175

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): ~1 Purge Water Management: onsite containment

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

purge time 1510

Sample Time: 1543 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: see sample memo dated 7-31-2020 NES-ACM

Other Observations / Equipment Operation Problems: OTP= 25.27

Sampler Signature: [signature] Date: 8-27-2020 Page 1 of 1

QA/QC Signature: M. Joyner Date: 8-31-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-27-2020

Weather: sun, 90s

Project Name: Bremo P.S.

Project No./Task No.: 20139823

Event: NES ACM

Sampler(s): M. Taylor

Well ID: MW-360

Field Calibration Completed: 0840 8-27-2020

Well Diameter: 2.0 inches

Initial Depth to Water: 11.02 feet

Depth to Bottom: 70.60 feet

Water Column Thickness: 59.58 feet

Equipment Used:
- [X] WL Indicator
- [ ] Turbidity Meter
- [ ] Air Tank
- [ ] Dedicated Bladder Pump
- [ ] YSI —
- [ ] Peristaltic Pump
- [ ] Compressor
- [X] Non-dedicated BP
- [X] In-Situ AquaTroll 600 542080
- [ ] 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
1521	6.57	655.90	7.11	3.49	21.35	-50.6	11.08	200
1524	6.51	658.15	2.04	1.41	20.92	-48.6	11.19	200
1527	6.38	641.99	6.59	1.07	20.26	-35.6	11.15	200
1530	6.28	632.70	4.37	1.01	20.05	-22.1	11.11	200
1533	6.27	628.19	2.19	0.94	19.80	-18.5	11.19	200
1536	6.27	620.67	1.78	1.00	19.72	-17.2	11.12	200
1537	—	sampled	—	—	—	—	—	—
1549	6.32	608.17	1.41	1.75	19.99	-2.6	11.14	200

Purge Cycle (End): 25/5 seconds @ 50 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): DTP: 62.84'

Total Purge Volume (Gallons): ~1.25 Purge Water Management: onsite polytank

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

purge start: 1517

Sample Time: 1537 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: Boron, Ca, Cl, sulfate, total Alkalinity, Mg, Na, ~~Mn~~ K, Cobalt, Li, Mo, Ag, Ni

Other Observations / Equipment Operation Problems:

NP NES Duplicate taken here

Sampler Signature: M. Taylor Date: 8-27-2020 Page 1 of 1

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER MICROPURGE SAMPLING LOG

Date: 8-28-2020
Weather: Sunny

Project Name: Bremo P.S. | Project No./Task No.: 20139823
Event: NES-ACM | Sampler(s): C. Joyner
Well ID: MW-VPDES | Field Calibration Completed: 8-28-2020 @ 0840
Well Diameter: 2 inches | Initial Depth to Water: 19.82 feet
Depth to Bottom: 31.11 feet | Water Column Thickness: 11.29 feet

Equipment Used:
- [x] WL Indicator
- [x] YSI PRO DSS AL104652
- [ ] In-Situ —
- [ ] Turbidity Meter
- [ ] Peristaltic Pump
- [ ] MP-10 Controller Box
- [ ] Air Tank
- [ ] Compressor
- [x] MP-15 Controller Box
- [ ] Dedicated Bladder Pump
- [x] 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
1225	6.25	387.8	15.05	3.31	25.1	74.0	20.11	~125
1230	5.84	373.1	18.48	1.48	20.6	86.7	21.40	125
1235	5.81	370.3	18.51	1.17	20.4	91.9	22.10	125
1240	5.78	371.0	12.53	1.06	20.1	98.3	22.90	125
1245	5.76	370.6	11.23	1.00	20.0	103.6	23.97	125
1250	5.74	371.4	10.90	0.99	20.1	107.6	24.95	125
1252	—	—	—	SAMPLE	—	—	—	—
1302	5.75	372.0	11.21	1.15	20.6	109.4	BTOP	125

Purge Cycle (End): 56/4 seconds @ 30 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): ~0.06

Total Purge Volume (Gallons): ~1.5 | Purge Water Management: Onsite containment

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

purge time 1223

Sample Time: 1252 | 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: See Golder sample memo - Reporting Group A - NP NES Groundwater 7-31-2020

Other Observations / Equipment Operation Problems: DTP = 25.52

Sampler Signature: [signature] Date: 8-28-2020 Page 1 of 1

QA/QC Signature: Date:

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-27-2020
Weather: cloudy, 90s

Project Name: Bremo Power Station
Project No./Task No.: 20139823
Event: NES ACM
Sampler(s): M. Taylor
Well ID: Duplicate - MP- NES
Field Calibration Completed: 0840 8-27-2020
Well Diameter: — 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. (°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	—	SAMPLED	—	—	—	—	—	—

Purge Cycle (End): — seconds @ — 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): duplicate taken at MW-36D, clear grab sample see MW-36D for sampling details

Sample Time: 1545
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: B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K, Cobalt, Lithium, Molybdenum, silver, Nickel

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor
Date: 8-27-2020
Page 1 of 1

QA/QC Signature:
Date: 8-28-2020

GOLDER

MICROPURGE SAMPLING LOG

Date: 8-27-2020

Weather: Sun, 90s

Project Name: Bremo Power Station

Project No./Task No.: 20139823

Event: NES-ACM

Sampler(s): M. Taylor

Well ID: Field Blank - NP NES

Field Calibration Completed: 0840 8-27-2020

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
1534	—	SAMPLED	—	—	—	—	—	—

Purge Cycle (End): — seconds @ — 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 using lab-deionized water near MW-360

Sample Time: 1534

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: B, Ca, Cl, sulfate, total alkalinity, Mg, Na, Potass, cobalt, Li, Mn, Ag, Ni

Other Observations / Equipment Operation Problems:

Sampler Signature: M. Taylor

Date: 8-27-2020

Page 1 of 1

QA/QC Signature:

Date: 8-28-2020

Appendix D

Laboratory Certificates of Analysis and Chain-of-Custody Forms - NES Sampling - Groundwater (August 2020)

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

September 11, 2020

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

RE: Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on August 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville

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.

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CERTIFICATIONS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Pace Analytical Services Asheville
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 PS NES-ACM (A)
Pace Project No.: 92493164

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92493164001	**MW-22D**	Water	08/28/20 11:42	08/28/20 15:28
92493164002	**MW-23D**	Water	08/28/20 10:23	08/28/20 15:28
92493164003	**MW-36S**	Water	08/27/20 15:43	08/28/20 15:28
92493164004	**MW-36D**	Water	08/27/20 15:37	08/28/20 15:28
92493164005	**MW-VPDES**	Water	08/28/20 12:52	08/28/20 15:28
92493164006	**Field Blank-NP NES**	Water	08/27/20 15:34	08/28/20 15:28
92493164007	**Duplicate-NP NES**	Water	08/27/20 15:45	08/28/20 15:28

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SAMPLE ANALYTE COUNT

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92493164001	**MW-22D**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164002	**MW-23D**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164003	**MW-36S**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164004	**MW-36D**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164005	**MW-VPDES**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164006	**Field Blank-NP NES**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493164007	**Duplicate-NP NES**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A

PASI-A = Pace Analytical Services - Asheville

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SUMMARY OF DETECTION

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92493164001	**MW-22D**					
EPA 6010D	Boron	310	ug/L	50.0	09/03/20 21:54	BC
EPA 6010D	Calcium	67100	ug/L	100	09/03/20 21:54	
EPA 6010D	Magnesium	12100	ug/L	100	09/03/20 21:54	
EPA 6010D	Molybdenum	7.9	ug/L	5.0	09/03/20 21:54	
EPA 6020B	Cobalt	0.41	ug/L	0.10	09/03/20 14:13	
EPA 6020B	Lithium	0.89J	ug/L	2.5	09/03/20 14:13	
EPA 6020B	Potassium	17400	ug/L	1500	09/04/20 15:18	
EPA 6020B	Sodium	43100	ug/L	25000	09/04/20 16:18	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	302	mg/L	5.0	09/04/20 20:35	
EPA 9056A	Chloride	11.3	mg/L	1.0	09/02/20 13:22	
EPA 9056A	Sulfate	13.4	mg/L	1.0	09/02/20 13:22	
92493164002	**MW-23D**					
EPA 6010D	Boron	50.7	ug/L	50.0	09/03/20 22:07	BC
EPA 6010D	Calcium	37000	ug/L	100	09/03/20 22:07	
EPA 6010D	Magnesium	8300	ug/L	100	09/03/20 22:07	
EPA 6010D	Molybdenum	12.8	ug/L	5.0	09/03/20 22:07	
EPA 6020B	Cobalt	0.17	ug/L	0.10	09/03/20 14:17	
EPA 6020B	Lithium	0.70J	ug/L	2.5	09/03/20 14:17	
EPA 6020B	Potassium	3200	ug/L	500	09/04/20 15:21	
EPA 6020B	Sodium	59200	ug/L	25000	09/04/20 16:22	M6
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	242	mg/L	5.0	09/04/20 20:52	
EPA 9056A	Chloride	11.0	mg/L	1.0	09/02/20 14:06	
EPA 9056A	Sulfate	2.9	mg/L	1.0	09/02/20 14:06	
92493164003	**MW-36S**					
EPA 6010D	Calcium	40700	ug/L	100	09/03/20 22:10	
EPA 6010D	Magnesium	30200	ug/L	100	09/03/20 22:10	
EPA 6020B	Cobalt	0.98	ug/L	0.10	09/03/20 14:43	
EPA 6020B	Lithium	0.85J	ug/L	2.5	09/03/20 14:43	
EPA 6020B	Potassium	1070	ug/L	50.0	09/03/20 14:43	
EPA 6020B	Sodium	13700	ug/L	7500	09/04/20 15:25	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	182	mg/L	5.0	09/04/20 21:18	
EPA 9056A	Chloride	13.0	mg/L	1.0	09/02/20 14:21	
EPA 9056A	Sulfate	44.1	mg/L	1.0	09/02/20 14:21	
92493164004	**MW-36D**					
EPA 6010D	Boron	266	ug/L	50.0	09/03/20 22:13	BC
EPA 6010D	Calcium	72900	ug/L	100	09/03/20 22:13	
EPA 6010D	Magnesium	23100	ug/L	100	09/03/20 22:13	
EPA 6020B	Cobalt	0.53	ug/L	0.10	09/03/20 14:46	
EPA 6020B	Lithium	7.2	ug/L	2.5	09/03/20 14:46	
EPA 6020B	Potassium	5240	ug/L	500	09/04/20 15:29	
EPA 6020B	Sodium	25500	ug/L	12500	09/04/20 16:25	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	218	mg/L	5.0	09/04/20 21:35	
EPA 9056A	Chloride	13.6	mg/L	1.0	09/02/20 14:36	
EPA 9056A	Sulfate	96.0	mg/L	1.0	09/02/20 14:36	

REPORT OF LABORATORY ANALYSIS

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SUMMARY OF DETECTION

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92493164005	**MW-VPDES**					
EPA 6010D	Boron	641	ug/L	50.0	09/03/20 22:16	BC
EPA 6010D	Calcium	48300	ug/L	100	09/03/20 22:16	
EPA 6010D	Magnesium	10800	ug/L	100	09/03/20 22:16	
EPA 6010D	Molybdenum	4.3J	ug/L	5.0	09/03/20 22:16	
EPA 6010D	Nickel	3.8J	ug/L	5.0	09/03/20 22:16	
EPA 6020B	Cobalt	2.0	ug/L	0.10	09/03/20 14:50	
EPA 6020B	Lithium	1.9J	ug/L	2.5	09/03/20 14:50	
EPA 6020B	Potassium	4280	ug/L	500	09/04/20 15:33	
EPA 6020B	Sodium	7440	ug/L	2500	09/04/20 15:33	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	105	mg/L	5.0	09/04/20 21:49	
EPA 9056A	Chloride	3.7	mg/L	1.0	09/02/20 14:51	
EPA 9056A	Sulfate	73.6	mg/L	1.0	09/02/20 14:51	
92493164007	**Duplicate-NP NES**					
EPA 6010D	Boron	259	ug/L	50.0	09/03/20 22:36	BC
EPA 6010D	Calcium	73200	ug/L	100	09/03/20 22:36	
EPA 6010D	Magnesium	23500	ug/L	100	09/03/20 22:36	
EPA 6020B	Cobalt	0.45	ug/L	0.10	09/03/20 14:58	
EPA 6020B	Lithium	7.2	ug/L	2.5	09/03/20 14:58	
EPA 6020B	Potassium	5260	ug/L	500	09/04/20 15:36	
EPA 6020B	Sodium	25800	ug/L	12500	09/04/20 16:40	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	214	mg/L	5.0	09/04/20 22:05	
EPA 9056A	Chloride	13.6	mg/L	1.0	09/02/20 15:51	
EPA 9056A	Sulfate	96.1	mg/L	1.0	09/02/20 15:51	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: MW-22D **Lab ID: 92493164001** Collected: 08/28/20 11:42 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	**310**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 21:54	7440-42-8	BC
Calcium	**67100**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 21:54	7440-70-2	
Magnesium	**12100**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 21:54	7439-95-4	
Molybdenum	**7.9**	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 21:54	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 21:54	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 21:54	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.41**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:13	7440-48-4	
Lithium	**0.89J**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:13	7439-93-2	
Potassium	**17400**	ug/L	1500	270	30	09/03/20 00:51	09/04/20 15:18	7440-09-7	
Sodium	**43100**	ug/L	25000	4910	100	09/03/20 00:51	09/04/20 16:18	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**302**	mg/L	5.0	5.0	1		09/04/20 20:35		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 20:35		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**11.3**	mg/L	1.0	0.60	1		09/02/20 13:22	16887-00-6	
Sulfate	**13.4**	mg/L	1.0	0.50	1		09/02/20 13:22	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: MW-23D **Lab ID: 92493164002** Collected: 08/28/20 10:23 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	**50.7**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:07	7440-42-8	BC
Calcium	**37000**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:07	7440-70-2	
Magnesium	**8300**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:07	7439-95-4	
Molybdenum	**12.8**	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:07	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:07	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:07	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.17**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:17	7440-48-4	
Lithium	**0.70J**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:17	7439-93-2	
Potassium	**3200**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:21	7440-09-7	
Sodium	**59200**	ug/L	25000	4910	100	09/03/20 00:51	09/04/20 16:22	7440-23-5	M6
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**242**	mg/L	5.0	5.0	1		09/04/20 20:52		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 20:52		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**11.0**	mg/L	1.0	0.60	1		09/02/20 14:06	16887-00-6	
Sulfate	**2.9**	mg/L	1.0	0.50	1		09/02/20 14:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: MW-36S **Lab ID: 92493164003** Collected: 08/27/20 15:43 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	ND	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:10	7440-42-8	BC
Calcium	**40700**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:10	7440-70-2	
Magnesium	**30200**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:10	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:10	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:10	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:10	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.98**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:43	7440-48-4	
Lithium	**0.85J**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:43	7439-93-2	
Potassium	**1070**	ug/L	50.0	9.0	1	09/03/20 00:51	09/03/20 14:43	7440-09-7	
Sodium	**13700**	ug/L	7500	1470	30	09/03/20 00:51	09/04/20 15:25	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**182**	mg/L	5.0	5.0	1		09/04/20 21:18		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 21:18		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.0**	mg/L	1.0	0.60	1		09/02/20 14:21	16887-00-6	
Sulfate	**44.1**	mg/L	1.0	0.50	1		09/02/20 14:21	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: MW-36D **Lab ID: 92493164004** Collected: 08/27/20 15:37 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	**266**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:13	7440-42-8	BC
Calcium	**72900**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:13	7440-70-2	
Magnesium	**23100**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:13	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:13	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:13	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:13	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.53**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:46	7440-48-4	
Lithium	**7.2**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:46	7439-93-2	
Potassium	**5240**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:29	7440-09-7	
Sodium	**25500**	ug/L	12500	2450	50	09/03/20 00:51	09/04/20 16:25	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**218**	mg/L	5.0	5.0	1		09/04/20 21:35		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 21:35		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.6**	mg/L	1.0	0.60	1		09/02/20 14:36	16887-00-6	
Sulfate	**96.0**	mg/L	1.0	0.50	1		09/02/20 14:36	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: MW-VPDES **Lab ID: 92493164005** Collected: 08/28/20 12:52 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	**641**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:16	7440-42-8	BC
Calcium	**48300**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:16	7440-70-2	
Magnesium	**10800**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:16	7439-95-4	
Molybdenum	**4.3J**	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:16	7439-98-7	
Nickel	**3.8J**	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:16	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:16	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**2.0**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:50	7440-48-4	
Lithium	**1.9J**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:50	7439-93-2	
Potassium	**4280**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:33	7440-09-7	
Sodium	**7440**	ug/L	2500	491	10	09/03/20 00:51	09/04/20 15:33	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**105**	mg/L	5.0	5.0	1		09/04/20 21:49		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 21:49		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**3.7**	mg/L	1.0	0.60	1		09/02/20 14:51	16887-00-6	
Sulfate	**73.6**	mg/L	1.0	0.50	1		09/02/20 14:51	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: Field Blank-NP NES **Lab ID: 92493164006** Collected: 08/27/20 15:34 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	ND	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:20	7440-42-8	BC
Calcium	ND	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:20	7440-70-2	
Magnesium	ND	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:20	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:20	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:20	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:20	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	ND	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:54	7440-48-4	
Lithium	ND	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:54	7439-93-2	
Potassium	ND	ug/L	50.0	9.0	1	09/03/20 00:51	09/03/20 14:54	7440-09-7	
Sodium	ND	ug/L	250	49.1	1	09/03/20 00:51	09/03/20 14:54	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:01		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:01		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	ND	mg/L	1.0	0.60	1		09/02/20 15:06	16887-00-6	
Sulfate	ND	mg/L	1.0	0.50	1		09/02/20 15:06	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Sample: Duplicate-NP NES **Lab ID: 92493164007** Collected: 08/27/20 15:45 Received: 08/28/20 15:28 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 Pace Analytical Services - Asheville								
Boron	**259**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:36	7440-42-8	BC
Calcium	**73200**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:36	7440-70-2	
Magnesium	**23500**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:36	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:36	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:36	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:36	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.45**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 14:58	7440-48-4	
Lithium	**7.2**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 14:58	7439-93-2	
Potassium	**5260**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:36	7440-09-7	
Sodium	**25800**	ug/L	12500	2450	50	09/03/20 00:51	09/04/20 16:40	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**214**	mg/L	5.0	5.0	1		09/04/20 22:05		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:05		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.6**	mg/L	1.0	0.60	1		09/02/20 15:51	16887-00-6	
Sulfate	**96.1**	mg/L	1.0	0.50	1		09/02/20 15:51	14808-79-8	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

QC Batch: 564173 | Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

METHOD BLANK: 2990748 Matrix: Water
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	35.2J	50.0	32.4	09/03/20 21:40	BC
Calcium	ug/L	ND	100	94.2	09/03/20 21:40	
Magnesium	ug/L	ND	100	67.8	09/03/20 21:40	
Molybdenum	ug/L	ND	5.0	3.9	09/03/20 21:40	
Nickel	ug/L	ND	5.0	3.5	09/03/20 21:40	
Silver	ug/L	ND	5.0	2.5	09/03/20 21:40	

LABORATORY CONTROL SAMPLE: 2990749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	513	103	80-120	
Calcium	ug/L	5000	4870	97	80-120	
Magnesium	ug/L	5000	4940	99	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Nickel	ug/L	500	501	100	80-120	
Silver	ug/L	250	246	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990750 2990751

Parameter	Units	92493164001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	310	500	500	841	831	106	104	75-125	1	20	
Calcium	ug/L	67100	5000	5000	72100	71400	101	87	75-125	1	20	
Magnesium	ug/L	12100	5000	5000	17200	16900	102	97	75-125	1	20	
Molybdenum	ug/L	7.9	500	500	530	522	104	103	75-125	1	20	
Nickel	ug/L	ND	500	500	507	501	101	100	75-125	1	20	
Silver	ug/L	ND	250	250	260	255	104	102	75-125	2	20	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

QC Batch: 564174 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A | Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

METHOD BLANK: 2990752 Matrix: Water
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	09/03/20 14:05	
Lithium	ug/L	ND	2.5	0.39	09/03/20 14:05	
Potassium	ug/L	ND	50.0	9.0	09/03/20 14:05	
Sodium	ug/L	ND	250	49.1	09/03/20 14:05	

LABORATORY CONTROL SAMPLE: 2990753

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.5	105	80-120	
Lithium	ug/L	50	53.9	108	80-120	
Potassium	ug/L	625	640	102	80-120	
Sodium	ug/L	625	654	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990754 2990755

Parameter	Units	92493164002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	0.17	10	10	10.6	10.6	105	104	75-125	0	20	
Lithium	ug/L	0.70J	50	50	51.1	50.3	101	99	75-125	2	20	
Potassium	ug/L	3200	625	625	3870	3860	107	104	75-125	0	20	
Sodium	ug/L	59200	625	625	58800	58500	-56	-99	75-125	0	20	M6

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

QC Batch: 564261 | Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

METHOD BLANK: 2990998 Matrix: Water
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	5.0	5.0	09/04/20 19:15	
Alkalinity,Carbonate (CaCO3)	mg/L	ND	5.0	5.0	09/04/20 19:15	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

QC Batch: 564027 | Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A | Analysis Description: 9056 IC anions 28 Days
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

METHOD BLANK: 2989816 Matrix: Water
Associated Lab Samples: 92493164001, 92493164002, 92493164003, 92493164004, 92493164005, 92493164006, 92493164007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	09/02/20 12:52	
Sulfate	mg/L	ND	1.0	0.50	09/02/20 12:52	

LABORATORY CONTROL SAMPLE: 2989817

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.7	103	90-110	
Sulfate	mg/L	50	52.4	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2989818 2989819

Parameter	Units	92493164001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.3	50	50	62.3	62.3	102	102	90-110	0	10	
Sulfate	mg/L	13.4	50	50	63.8	63.9	101	101	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2989820 2989821

Parameter	Units	92493167004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.9	50	50	56.4	56.6	99	99	90-110	0	10	
Sulfate	mg/L	53.2	50	50	97.7	97.7	89	89	90-110	0	10	M1

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QUALIFIERS

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

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.

ANALYTE QUALIFIERS

BC	The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the laboratory reporting limit.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS NES-ACM (A)
Pace Project No.: 92493164

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92493164001	**MW-22D**	EPA 3010A	564173	EPA 6010D	564195
92493164002	**MW-23D**	EPA 3010A	564173	EPA 6010D	564195
92493164003	**MW-36S**	EPA 3010A	564173	EPA 6010D	564195
92493164004	**MW-36D**	EPA 3010A	564173	EPA 6010D	564195
92493164005	**MW-VPDES**	EPA 3010A	564173	EPA 6010D	564195
92493164006	**Field Blank-NP NES**	EPA 3010A	564173	EPA 6010D	564195
92493164007	**Duplicate-NP NES**	EPA 3010A	564173	EPA 6010D	564195
92493164001	**MW-22D**	EPA 3010A	564174	EPA 6020B	564191
92493164002	**MW-23D**	EPA 3010A	564174	EPA 6020B	564191
92493164003	**MW-36S**	EPA 3010A	564174	EPA 6020B	564191
92493164004	**MW-36D**	EPA 3010A	564174	EPA 6020B	564191
92493164005	**MW-VPDES**	EPA 3010A	564174	EPA 6020B	564191
92493164006	**Field Blank-NP NES**	EPA 3010A	564174	EPA 6020B	564191
92493164007	**Duplicate-NP NES**	EPA 3010A	564174	EPA 6020B	564191
92493164001	**MW-22D**	SM 2320B-2011	564261		
92493164002	**MW-23D**	SM 2320B-2011	564261		
92493164003	**MW-36S**	SM 2320B-2011	564261		
92493164004	**MW-36D**	SM 2320B-2011	564261		
92493164005	**MW-VPDES**	SM 2320B-2011	564261		
92493164006	**Field Blank-NP NES**	SM 2320B-2011	564261		
92493164007	**Duplicate-NP NES**	SM 2320B-2011	564261		
92493164001	**MW-22D**	EPA 9056A	564027		
92493164002	**MW-23D**	EPA 9056A	564027		
92493164003	**MW-36S**	EPA 9056A	564027		
92493164004	**MW-36D**	EPA 9056A	564027		
92493164005	**MW-VPDES**	EPA 9056A	564027		
92493164006	**Field Blank-NP NES**	EPA 9056A	564027		
92493164007	**Duplicate-NP NES**	EPA 9056A	564027		

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CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workor

WO# : 92493164

92493164

ALL SHADE

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo NP NES-ACM Sampling	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Taylor / C. Joyner	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U	U								

** 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 _____ (O1) Other 1 _____

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	Analyses: 6010/6020 Metals (B, Ca, Mg, Na, K, Co, Li, Mo, Ag, Ni)	Analyses: 9056 Anions (Chloride, Sulfate)	Analyses: SM2320B Alkalinity as CaCO3	Lab Profile/Line:
MW-22D	GW	G	8/28/2020	1142			N	3	X	X	X	*all bottles preserved on ice* 001
MW-23D	GW	G	8/28/2020	1023			N	3	X	X	X	002
MW-36S	GW	G	8/29/2020	1543			N	3	X	X	X	003
MW-36D	GW	G	8/29/2020	1537			N	3	X	X	X	004
MW-VPDES	GW	G	8/28/2020	1252			N	3	X	X	X	005
Field Blank-NP NES	GW	G	8/29/2020	1534		MT	N	3	X	X	X	006
Duplicate-NP NES	GW	G	8/29/2020	1545			N	3	X	X	X	007

Lab Profile/Line:

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ✓ N NA
Custody Signatures Present ✓ N NA
Collector Signature Present ✓ N NA
Bottles Intact ✓ N NA
Correct Bottles ✓ N NA
Sufficient Volume ✓ N NA
Samples Received on Ice ✓ N NA
VOA - Headspace Acceptable Y N ✓NA
USDA Regulated Soils Y N ✓NA
Samples in Holding Time ✓ N NA
Residual Chlorine Present Y N ✓NA
Cl Strips: _____
Sample pH Acceptable ✓ N NA
pH Strips: 232518V
Sulfide Present Y N ✓NA
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92493164

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group A NP NES Groundwater for more details.

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 3.0 °C
Cooler 1 Therm Corr. Factor: 0.0 °C
Cooler 1 Corrected Temp: 3.0 °C
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Maria Joyce / Golder	8/28/2020 1528	Rachel Burruss	8-28-20 1528
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: 1 of: 1

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

September 11, 2020

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

RE: Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory between August 25, 2020 and August 27, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville

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.

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CERTIFICATIONS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Pace Analytical Services Asheville
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 NP NES-ACM (D)
Pace Project No.: 92492415

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92492415001	**MW-35**	Water	08/24/20 16:30	08/25/20 15:28
92492415002	**MW-24**	Water	08/25/20 12:30	08/25/20 15:28
92492415003	**MW-27D**	Water	08/25/20 15:48	08/26/20 15:45
92492415004	**MW-33**	Water	08/25/20 16:37	08/27/20 15:25
92492415005	**MW-34**	Water	08/25/20 15:20	08/27/20 15:25
92492415006	**MW-12**	Water	08/27/20 11:39	08/27/20 15:25

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SAMPLE ANALYTE COUNT

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92492415001	**MW-35**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	BG2	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92492415002	**MW-24**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	BG2	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92492415003	**MW-27D**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	BG2	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92492415004	**MW-33**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	JOR	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92492415005	**MW-34**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	JOR	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92492415006	**MW-12**	EPA 6010D	KQ	1	PASI-A
		EPA 6020B	JOR	2	PASI-A
		SM 2320B-2011	ECH	1	PASI-A

PASI-A = Pace Analytical Services - Asheville

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SUMMARY OF DETECTION

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92492415001	**MW-35**					
EPA 6010D	Magnesium	10200	ug/L	100	08/31/20 08:41	
EPA 6020B	Potassium	10100	ug/L	1000	09/01/20 13:04	
EPA 6020B	Sodium	23000	ug/L	5000	09/01/20 13:04	
SM 2320B-2011	Alkalinity, Total as CaCO3	214	mg/L	5.0	09/03/20 19:05	
92492415002	**MW-24**					
EPA 6010D	Magnesium	10800	ug/L	100	08/31/20 08:44	
EPA 6020B	Potassium	10500	ug/L	2500	09/01/20 13:08	
EPA 6020B	Sodium	37000	ug/L	12500	09/01/20 13:08	
SM 2320B-2011	Alkalinity, Total as CaCO3	241	mg/L	5.0	09/03/20 20:06	
92492415003	**MW-27D**					
EPA 6010D	Magnesium	26500	ug/L	100	08/31/20 08:48	
EPA 6020B	Potassium	4060	ug/L	1250	09/01/20 13:11	
EPA 6020B	Sodium	186000	ug/L	50000	09/01/20 13:19	
SM 2320B-2011	Alkalinity, Total as CaCO3	360	mg/L	5.0	09/03/20 20:23	
92492415004	**MW-33**					
EPA 6010D	Magnesium	14200	ug/L	100	08/31/20 09:36	
EPA 6020B	Potassium	9440	ug/L	2500	09/08/20 17:58	
EPA 6020B	Sodium	28000	ug/L	12500	09/08/20 17:58	
SM 2320B-2011	Alkalinity, Total as CaCO3	245	mg/L	5.0	09/04/20 19:25	M1
92492415005	**MW-34**					
EPA 6010D	Magnesium	13200	ug/L	100	08/31/20 09:40	
EPA 6020B	Potassium	1840	ug/L	1250	09/08/20 18:02	
EPA 6020B	Sodium	23800	ug/L	6250	09/08/20 18:02	
SM 2320B-2011	Alkalinity, Total as CaCO3	144	mg/L	5.0	09/04/20 20:05	
92492415006	**MW-12**					
EPA 6010D	Magnesium	8060	ug/L	100	08/31/20 09:49	
EPA 6020B	Potassium	816	ug/L	50.0	09/07/20 22:43	
EPA 6020B	Sodium	13900	ug/L	7500	09/08/20 18:13	
SM 2320B-2011	Alkalinity, Total as CaCO3	51.7	mg/L	5.0	09/08/20 15:11	

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-35 **Lab ID: 92492415001** Collected: 08/24/20 16:30 Received: 08/25/20 15:28 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 Pace Analytical Services - Asheville								
Magnesium	**10200**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 08:41	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**10100**	ug/L	1000	180	20	08/28/20 01:18	09/01/20 13:04	7440-09-7	
Sodium	**23000**	ug/L	5000	982	20	08/28/20 01:18	09/01/20 13:04	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**214**	mg/L	5.0	5.0	1		09/03/20 19:05		

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-24 **Lab ID: 92492415002** Collected: 08/25/20 12:30 Received: 08/25/20 15:28 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 Pace Analytical Services - Asheville								
Magnesium	**10800**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 08:44	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**10500**	ug/L	2500	450	50	08/28/20 01:18	09/01/20 13:08	7440-09-7	
Sodium	**37000**	ug/L	12500	2450	50	08/28/20 01:18	09/01/20 13:08	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**241**	mg/L	5.0	5.0	1		09/03/20 20:06		

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-27D **Lab ID: 92492415003** Collected: 08/25/20 15:48 Received: 08/26/20 15:45 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 Pace Analytical Services - Asheville								
Magnesium	**26500**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 08:48	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**4060**	ug/L	1250	225	25	08/28/20 01:18	09/01/20 13:11	7440-09-7	
Sodium	**186000**	ug/L	50000	9820	200	08/28/20 01:18	09/01/20 13:19	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**360**	mg/L	5.0	5.0	1		09/03/20 20:23		

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-33 **Lab ID: 92492415004** Collected: 08/25/20 16:37 Received: 08/27/20 15:25 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 Pace Analytical Services - Asheville								
Magnesium	**14200**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 09:36	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**9440**	ug/L	2500	450	50	09/05/20 00:49	09/08/20 17:58	7440-09-7	
Sodium	**28000**	ug/L	12500	2450	50	09/05/20 00:49	09/08/20 17:58	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**245**	mg/L	5.0	5.0	1		09/04/20 19:25		M1

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-34 **Lab ID: 92492415005** Collected: 08/25/20 15:20 Received: 08/27/20 15:25 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 Pace Analytical Services - Asheville								
Magnesium	**13200**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 09:40	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**1840**	ug/L	1250	225	25	09/05/20 00:49	09/08/20 18:02	7440-09-7	
Sodium	**23800**	ug/L	6250	1230	25	09/05/20 00:49	09/08/20 18:02	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**144**	mg/L	5.0	5.0	1		09/04/20 20:05		

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ANALYTICAL RESULTS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Sample: MW-12 **Lab ID: 92492415006** Collected: 08/27/20 11:39 Received: 08/27/20 15:25 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 Pace Analytical Services - Asheville								
Magnesium	**8060**	ug/L	100	67.8	1	08/29/20 02:01	08/31/20 09:49	7439-95-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Potassium	**816**	ug/L	50.0	9.0	1	09/05/20 00:49	09/07/20 22:43	7440-09-7	
Sodium	**13900**	ug/L	7500	1470	30	09/05/20 00:49	09/08/20 18:13	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity, Total as CaCO3	**51.7**	mg/L	5.0	5.0	1		09/08/20 15:11		

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QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 563240 | Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A | Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415001, 92492415002, 92492415003, 92492415004, 92492415005, 92492415006

METHOD BLANK: 2986672 Matrix: Water
Associated Lab Samples: 92492415001, 92492415002, 92492415003, 92492415004, 92492415005, 92492415006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Magnesium	ug/L	ND	100	67.8	08/31/20 08:28	

LABORATORY CONTROL SAMPLE: 2986673

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Magnesium	ug/L	5000	4770	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2986674 2986675

Parameter	Units	92492605003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Magnesium	ug/L	34400	5000	5000	40400	39200	120	96	75-125	3	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.

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QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 562977
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415001, 92492415002, 92492415003

METHOD BLANK: 2985455 Matrix: Water
Associated Lab Samples: 92492415001, 92492415002, 92492415003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Potassium	ug/L	ND	50.0	9.0	08/31/20 22:26	
Sodium	ug/L	ND	250	49.1	08/31/20 22:26	

LABORATORY CONTROL SAMPLE: 2985456

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Potassium	ug/L	625	619	99	80-120	
Sodium	ug/L	625	635	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2985457 2985458

Parameter	Units	92492363002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Potassium	ug/L	9870	625	625	10300	10500	75	99	75-125	1	20	E
Sodium	ug/L	34900	625	625	35200	35500	51	95	75-125	1	20	E,M1

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REPORT OF LABORATORY ANALYSIS

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

QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 564767
QC Batch Method: EPA 3010A
Analysis Method: EPA 6020B
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415004, 92492415005, 92492415006

METHOD BLANK: 2993784 Matrix: Water
Associated Lab Samples: 92492415004, 92492415005, 92492415006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Potassium	ug/L	ND	50.0	9.0	09/08/20 17:09	
Sodium	ug/L	ND	250	49.1	09/08/20 17:09	

LABORATORY CONTROL SAMPLE: 2993785

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Potassium	ug/L	625	644	103	80-120	
Sodium	ug/L	625	647	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993786 2993787

Parameter	Units	92492605003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Potassium	ug/L	8830	625	625	8820	8990	-3	24	75-125	2	20	E,M1
Sodium	ug/L	16000	625	625	14300	14800	-276	-193	75-125	4	20	E,M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2993788 2993789

Parameter	Units	92492846001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Potassium	ug/L	1030	625	625	1690	1710	104	109	75-125	2	20	E
Sodium	ug/L	5720	625	625	5720	5830	-1	17	75-125	2	20	E,M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 564259 | Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415001, 92492415002, 92492415003

METHOD BLANK: 2990990 Matrix: Water
Associated Lab Samples: 92492415001, 92492415002, 92492415003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	5.0	09/03/20 16:20	

LABORATORY CONTROL SAMPLE: 2990991

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	49.0	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990992 2990993

Parameter	Units	92492228005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	ND	50	50	53.7	53.1	100	99	80-120	1	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990994 2990995

Parameter	Units	92492228015 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	46.5	50	50	95.9	97.4	99	102	80-120	2	25	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 564261
QC Batch Method: SM 2320B-2011
Analysis Method: SM 2320B-2011
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415004, 92492415005

METHOD BLANK: 2990998 Matrix: Water
Associated Lab Samples: 92492415004, 92492415005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	5.0	09/04/20 19:15	

LABORATORY CONTROL SAMPLE: 2990999

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	49.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2991000 2991001

Parameter	Units	92492415004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	245	50	50	301	306	110	122	80-120	2	25	M1

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2991002 2991003

Parameter	Units	92493164007 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	214	50	50	268	270	109	113	80-120	1	25	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

QC Batch: 564905
QC Batch Method: SM 2320B-2011
Analysis Method: SM 2320B-2011
Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92492415006

METHOD BLANK: 2994267 Matrix: Water
Associated Lab Samples: 92492415006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	5.0	09/08/20 14:04	

LABORATORY CONTROL SAMPLE: 2994268

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	46.5	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2994269 2994270

Parameter	Units	92493167004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	49.8	50	50	102	103	103	106	80-120	1	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2994271 2994272

Parameter	Units	92493068005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	70.9	50	50	125	127	108	111	80-120	1	25	

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Huntersville, NC 28078
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QUALIFIERS

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

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.

ANALYTE QUALIFIERS

E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo NP NES-ACM (D)
Pace Project No.: 92492415

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92492415001	**MW-35**	EPA 3010A	563240	EPA 6010D	563251
92492415002	**MW-24**	EPA 3010A	563240	EPA 6010D	563251
92492415003	**MW-27D**	EPA 3010A	563240	EPA 6010D	563251
92492415004	**MW-33**	EPA 3010A	563240	EPA 6010D	563251
92492415005	**MW-34**	EPA 3010A	563240	EPA 6010D	563251
92492415006	**MW-12**	EPA 3010A	563240	EPA 6010D	563251
92492415001	**MW-35**	EPA 3010A	562977	EPA 6020B	562996
92492415002	**MW-24**	EPA 3010A	562977	EPA 6020B	562996
92492415003	**MW-27D**	EPA 3010A	562977	EPA 6020B	562996
92492415004	**MW-33**	EPA 3010A	564767	EPA 6020B	564776
92492415005	**MW-34**	EPA 3010A	564767	EPA 6020B	564776
92492415006	**MW-12**	EPA 3010A	564767	EPA 6020B	564776
92492415001	**MW-35**	SM 2320B-2011	564259		
92492415002	**MW-24**	SM 2320B-2011	564259		
92492415003	**MW-27D**	SM 2320B-2011	564259		
92492415004	**MW-33**	SM 2320B-2011	564261		
92492415005	**MW-34**	SM 2320B-2011	564261		
92492415006	**MW-12**	SM 2320B-2011	564905		

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WO# : 92492415

ALL SHADI 92492415

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo NP NES-ACM Sampling Addtl Cations/Anions	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): M. Taylor / C. Joyner / J. England	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature):	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U									

** 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 _____ (O1) Other 1 _____

Lab Project Manager:

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	Analyses: 6010/6020 Metals (Mg, Na, K)	Analyses: SM2320B Alkalinity as CaCO3	Lab Profile/Line:
MW-35	GW	G	8/24/2020	1630			N	2	X	X	*all bottles preserved on ice * 001
MW-24	GW	G	~~8/24/2020~~ 8/25/2020 MT	1230			N	2	X	X	002
						MT					

Lab Sample Receipt Checklist:
Custody Seals Present/Intact: N NA
Custody Signatures Present: N NA
Collector Signature Present: N NA
Bottles Intact: N NA
Correct Bottles: N NA
Sufficient Volume: N NA
Samples Received on Ice: N NA
VOA - Headspace Acceptable: Y N NA
USDA Regulated Soils: Y N NA
Samples in Holding Time: N NA
Residual Chlorine Present: Y N NA
Cl Strips: 0205
Sample pH Acceptable: N NA
pH Strips: 232518V
Sulfide Present: Y N NA
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492415

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group D for more details. Cations/Anions

Type of Ice Used: (Wet) Blue Dry None

Packing Material Used: (None)

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y (N) N/A

Lab Tracking #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 3.9 oC
Cooler 1 Therm Corr. Factor: 0.0 oC
Cooler 1 Corrected Temp: 3.8 oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M. Taylor (Golder)	8/25/2020 1405	Paul Jone	8/25/20 1405
Paul Jone	8/25/20 1528	Rachel Burruss	8-25-20 1528

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: 1 of: 1

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WO# : 92492415

PM: NMG Due Date: 09/09/20

CLIENT: 92-Golder

ALL SHADE

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo NP NES-ACM Sampling Addtl Cations/Anions	State: VA / County/City: Bremo Bluff Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): M. Taylor / C. Joyner	Purchase Order # : 20139823 Quote #: / DW PWS ID #: DW Location Code:
Collected By (signature): M Taylor / C Joyner	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U									

** 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 _____ (O1) Other 1 _____

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	Analyses: 6010/6020 Metals (Mg, Na, K)	Analyses: SM2320B Alkalinity as CaCO3	Lab Profile/Line:
MW-27D	GW	G	8/25/2020	1548			N	2	X	X	* all bottles preserved on ice * 003
MW-~~33~~ MT-34	GW	G	8/25/2020	1520			N	2	X	X	005
MW-~~34~~ MT-33	GW	G	8/25/2020	1637			N	2	X	X	004
						MT					

Lab Sample Receipt Checklist:

Custody Seals Present/Intact	✓	N	NA
Custody Signatures Present	✓	N	NA
Collector Signature Present	✓	N	NA
Bottles Intact	✓	N	NA
Correct Bottles	✓	N	NA
Sufficient Volume	✓	N	NA
Samples Received on Ice	✓	N	NA
VOA - Headspace Acceptable	Y	N	~~NA~~
USDA Regulated Soils	Y	N	~~NA~~
Samples in Holding Time	✓	N	NA
Residual Chlorine Present	Y	~~N~~	~~NA~~ RSD
Cl Strips: DZ05			
Sample pH Acceptable	✓	N	NA
pH Strips: 232518V			
Sulfide Present	Y	N	~~NA~~
Lead Acetate Strips: _____			

LAB USE ONLY:
Lab Sample # / Comments:

92492415

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group D for more details. Cations/Anions

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 4.3 °C
Cooler 1 Therm Corr. Factor: 0.0 °C
Cooler 1 Corrected Temp: 4.3 °C
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
M Taylor / Golder	8/26/2020 1405	Charlie Trent	8/26 14:05
Charlie Trent	8/26 3:45	Rachel Burruss	8-26-20 1545

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: 1 of: 1

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WO# : 92492415

PM: NMG **Due Date: 09/09/20**

CLIENT: 92-Golder

ALL S

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo NP NES-ACM Sampling Addtl Cations/Anions	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): M. Taylor ~~M.~~ ~~Joyner~~ MT	Purchase Order # : 20139823 Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Taylor	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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 U

** 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 _____ (O1) Other 1 _____

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	Analyses: 6010/6020 Metals (Mg, Na, K)	Analyses: SM2320B Alkalinity as CaCO3	Lab Profile/Line:
MW-33	GW	G	8/25/2020	1637	—	—	N	2	X	X	004
MW-34	GW	G	8/25/2020	1520	—	—	N	2	X	X	005
MW-12	GW	G	8/27/2020	1139	—	—	N	2	X	X	006
											* all bottles preserved on ice*

Lab Sample Receipt Checklist:
Custody Seals Present/Intact ✓ N NA
Custody Signatures Present ✓ N NA
Collector Signature Present ✓ N NA
Bottles Intact ✓ N NA
Correct Bottles ✓ N NA
Sufficient Volume ✓ N NA
Samples Received on Ice ✓ N NA
VOA - Headspace Acceptable Y N ~~NA~~
USDA Regulated Soils Y N ~~NA~~
Samples in Holding Time ✓ N NA
Residual Chlorine Present Y ~~N~~ ~~NA~~ RSB
Cl Strips: ~~0205~~
Sample pH Acceptable ✓ N NA
pH Strips: 232518V
Sulfide Present Y N ~~NA~~
Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92492415

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group P for more details. cations/anions

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: T-3
Cooler 1 Temp Upon Receipt: 2.7 °C
Cooler 1 Therm Corr. Factor: 0.0 °C
Cooler 1 Corrected Temp: 2.7 °C
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Golder	8-27-2020 1400	Paul Love	8/27/20 1400
Paul Love	8/27/20 1525	Rachel Burruss	8-27-20 1525

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: 1 of: 1

Appendix E

Field Data Sheets - NES Sampling - Surface Water and Hyporheic Zones (August 2020)

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

Project Name: Bremo P.S. - NES SW/H2 **Project No./Task No.:** 20139823

Sample ID: H2-1 **Sampler(s):** M. Taylor

Equipment: YSI ProDSS 16D104376, bailer

Field Calibration Completed: 0845 8-28-2020

Time	Collected: 0945 analyzed: 0946	**pH (S.U.)**	6.27
Cond. (µS/cm)	944	**Turb. (NTU)**	47.2
Dis. O_2 (mg/L)	3.97	**Temp. (°C)**	22.5
ORP (mvolts)	-63.1	**Flow Rate (gpm)**	—

SAMPLE LOCATION

Comments (sample methodology, weather conditions, color, silt, etc.): Sun, 80s

tan grab sample collected from H2 port with bailer

water level @ 0938: 2.59', H2 went dry after initial ~600mL purge, filled minimum volumes for lab

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☐ Stream condition:

other: H2 PVC port in good condition

Sample Time: 0940 Analyses: B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K, Co, Li, Mg, Ni

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

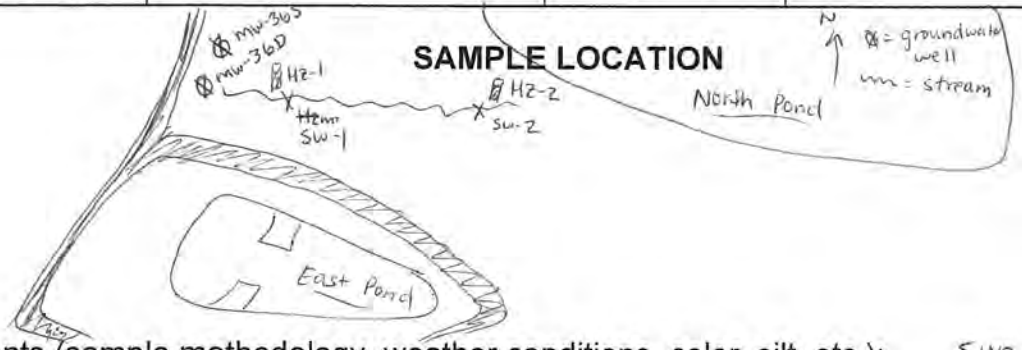
Project Name: Bremo P.S. - NES SW/HZ **Project No./Task No.:** 20139823

Sample ID: HZ-2 **Sampler(s):** M. Taylor

Equipment: YSI ProDSS ~~#~~ mr 16D104376, bailer

Field Calibration Completed: 8-28-2020 0845

Time	collected: 1010 analyzed: 1011	pH (S.U.)	6.75
Cond. (µS/cm)	257.4	Turb. (NTU)	1130.2
Dis. O_2 (mg/L)	5.22	Temp. (°C)	22.4
ORP (mvolts)	-12.1	Flow Rate (gpm)	—



Comments (sample methodology, weather conditions, color, silt, etc.): sun, 80s, dark tan/brown turbid grab sample

water level @ 1003: 2.71'; minimum volume collected - HZ went dry, ~~slow~~ slow recharge

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☐ Stream condition:

other: HZ port in good condition

Sample Time: 1005 Analyses: ~~B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K, Co, Li,~~ Mg, Ag, Ni

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

Project Name: Bremo P.S. – NES SW/HZ **Project No./Task No.:** 20139823

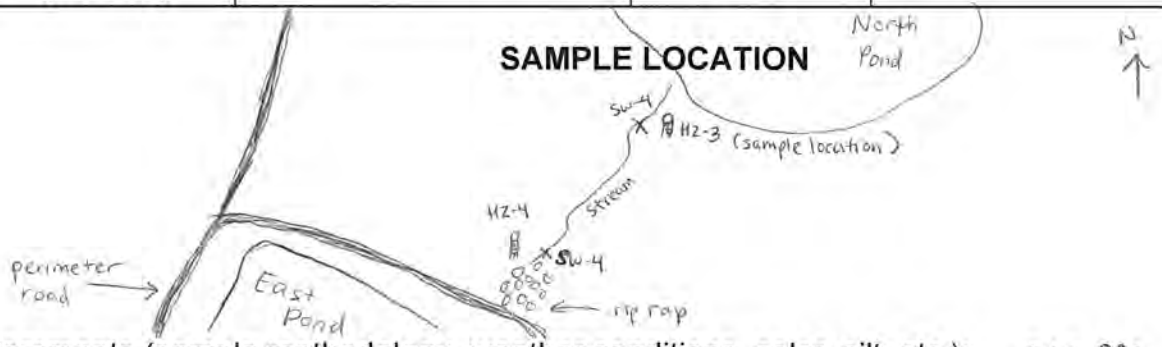
Sample ID: HZ-3 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376, bailer

Field Calibration Completed: 0845 8-28-2020

Time	collected: 1106 analyzed: 1108	**pH (S.U.)**	3.89
Cond. (µS/cm)	243.4	**Turb. (NTU)**	326.1
Dis. O_2 (mg/L)	5.94	**Temp. (°C)**	23.2
ORP (mvolts)	446.3	**Flow Rate (gpm)**	—

SAMPLE LOCATION



Comments (sample methodology, weather conditions, color, silt, etc.): sun, 90s, brown grab sample collected from HZ port with bailer

water level @ 1059 : 5.30'; HZ went dry after filling ~150mL in metals bottle and ~200mL in unpreserved bottle- slow recharge

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☐ Stream condition: other ☒:

HZ port in okay condition

Sample Time: 1100 Analyses: B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K, Co, Li, Mg, Ni

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

Project Name: Bremo P.S. - NES SW/H2 **Project No./Task No.:** 20139823

Sample ID: H2-4 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376, bailer

Field Calibration Completed: 0845 8-28-2020

Time	collected: 1142 analyzed: 1143	**pH (S.U.)**	5.69
Cond. (µS/cm)	240.9	**Turb. (NTU)**	208.7
Dis. O_2 (mg/L)	5.76	**Temp. (°C)**	21.9
ORP (mvolts)	209.6	**Flow Rate (gpm)**	—

SAMPLE LOCATION

Comments (sample methodology, weather conditions, color, silt, etc.): Sun, 90s, dark brown, ~~turbid~~ turbid grab sample collected from H2 port with bailer. depth to water at 1132: 2.74'; slow recharge - could only fill bottle volume minimums

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☐ Stream condition:

other: H2 port in okay condition

Sample Time: 1135 Analyses: B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K, Co, Li, Mg, N;

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

Project Name: Bremo P.S. - NES SW **Project No./Task No.:** 20139823

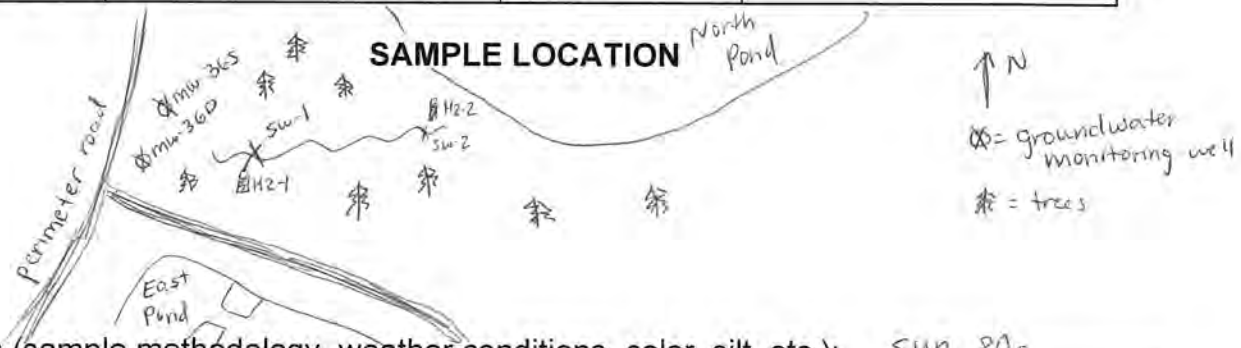
Sample ID: SW-1 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376

Field Calibration Completed: 0845 8-28-2020

Time	collected: 0932 analyzed: 0933	pH (S.U.)	6.61
Cond. (µS/cm)	324.2	Turb. (NTU)	19.7
Dis. O_2 (mg/L)	6.74	Temp. (°C)	22.5
ORP (mvolts)	115.2	Flow Rate (gpm)	<1

SAMPLE LOCATION



Comments (sample methodology, weather conditions, color, silt, etc.): sun, 80s

light gray grab sample collected from middle of stream, some small organic particles

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☒ Stream condition:

okay condition

Sample Time: 0930 Analyses: B, Ca, Cl, sulfate, alkalinity (total), Mg, Na, K, Co, Li, Mo, Ag, Ni

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

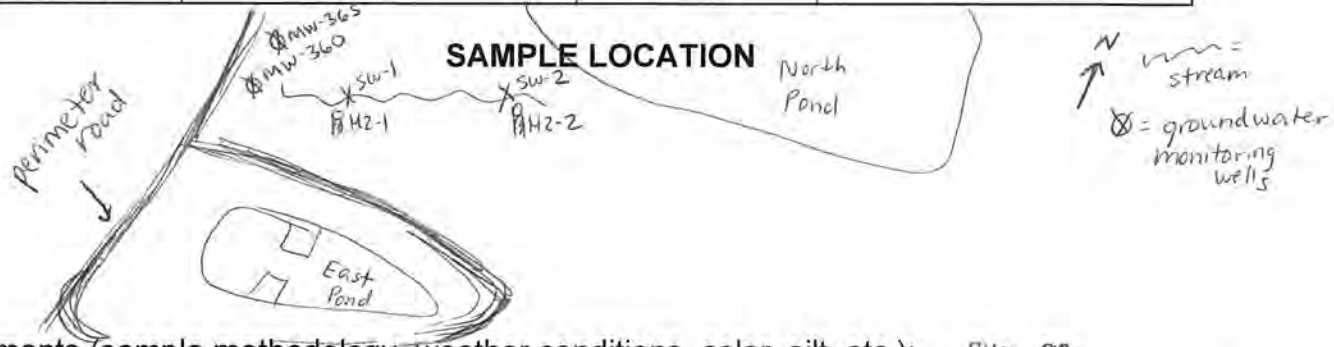
Project Name: Bremo P.S. **Project No./Task No.:** 20139823

Sample ID: SW-2 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376

Field Calibration Completed: 0845 8-28-2020

Time	collected: 1029 analyzed: 1030	**pH (S.U.)**	6.96
Cond. (µS/cm)	644	**Turb. (NTU)**	103.9
Dis. O_2 (mg/L)	8.52	**Temp. (°C)**	22.6
ORP (mvolts)	39.3	**Flow Rate (gpm)**	<1



Comments (sample methodology, weather conditions, color, silt, etc.): sun, 80s

gray grab sample collected from middle of stream flow

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☒ Stream condition:

okay condition

Sample Time: 1020 Analyses: ~~B, Ca, Cl, sulfate, total alkalinity, Mg, Na, K~~, Co, Li, Mg, Ag, Ni

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-29-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

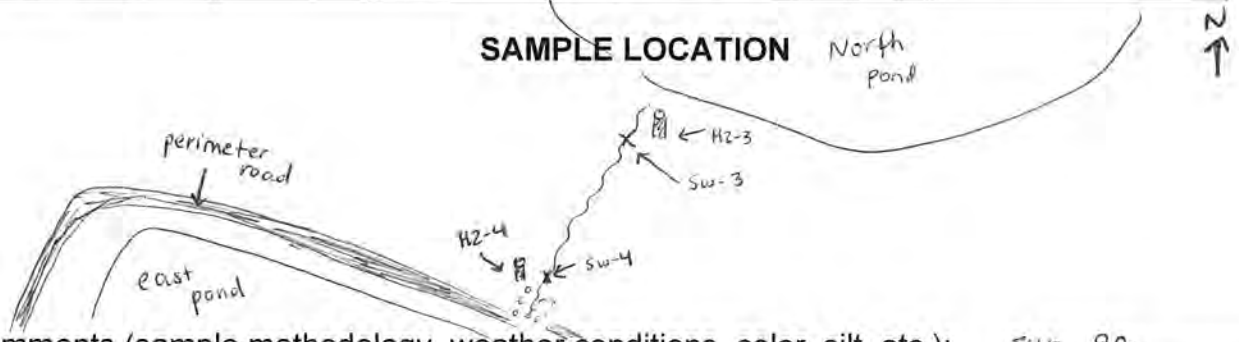
Project Name: Bremo P.S. - NES SW/HZ **Project No./Task No.:** 20139823
Sample ID: SW-3 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376

Field Calibration Completed: 0845 8-28-2020

Time	1110	**pH (S.U.)**	—
Cond. (µS/cm)	—	**Turb. (NTU)**	—
Dis. O_2 (mg/L)	—	**Temp. (°C)**	—
ORP (mvolts)	—	**Flow Rate (gpm)**	dry; no flow

SAMPLE LOCATION



Comments (sample methodology, weather conditions, color, silt, etc.): sun, 90s, dry stream, no flow, no sample collected

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☒ Stream condition: dry stream; okay condition

Sample Time: 1110 Analyses: —

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

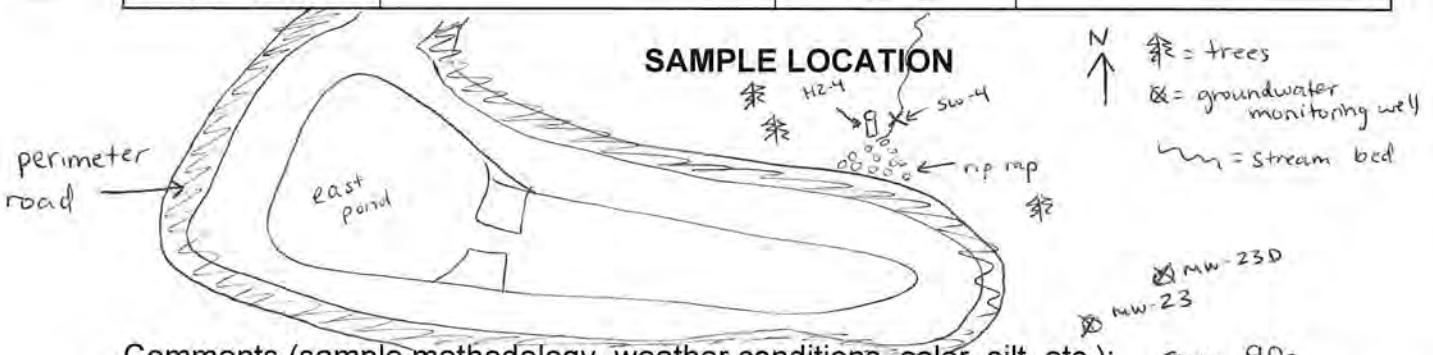
Project Name: Bremo P.S. - NES SW/HZ **Project No./Task No.:** 20139823

Sample ID: SW-4 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376

Field Calibration Completed: 0845 8-28-2020

Time	1145	**pH (S.U.)**	–
Cond. (µS/cm)	–	**Turb. (NTU)**	–
Dis. O_2 (mg/L)	–	**Temp. (°C)**	–
ORP (mvolts)	–	**Flow Rate (gpm)**	dry; no flow



Comments (sample methodology, weather conditions, color, silt, etc.): SW2, 90s
dry stream, no sample collected

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☒ Stream condition:
dry stream; okay condition

Sample Time: 1145 Analyses: –

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

GOLDER

DATE: 8-28-2020

SURFACE WATER SAMPLING LOG

Project Name: Bremo P.S. - NES NP Seep **Project No./Task No.:** 20139823

Sample ID: Seep-1 **Sampler(s):** M. Taylor

Equipment: YSI Pro DSS 16D104376

Field Calibration Completed: 0845 8-28-2020

Time	1230	**pH (S.U.)**	—
Cond. (µS/cm)	—	**Turb. (NTU)**	—
Dis. O_2 (mg/L)	—	**Temp. (°C)**	—
ORP (mvolts)	—	**Flow Rate (gpm)**	—

SAMPLE LOCATION

—

Comments (sample methodology, weather conditions, color, silt, etc.): sun, 90s; unable to locate seep-1; no sample collected

General visual observations of ☐ Basin ☐ Outfall ☐ Discharge Pipe ☐ Stream condition: —

Sample Time: — Analyses: —

Sampler Signature: M. Taylor Date: 8-28-2020

QA/QC Signature: [signature] Date: 8-28-2020

Appendix F

Laboratory Certificates of Analysis and Chain-of-Custody Forms - Surface Water and Hyporheic Zones (August 2020)

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

September 11, 2020

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

RE: Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Dear Mike Williams:

Enclosed are the analytical results for sample(s) received by the laboratory on August 28, 2020. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Asheville

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

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

CERTIFICATIONS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

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

SAMPLE SUMMARY

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92493167001	**SW-1**	Water	08/28/20 09:30	08/28/20 15:27
92493167002	**HZ-1**	Water	08/28/20 09:40	08/28/20 15:27
92493167003	**SW-2**	Water	08/28/20 10:20	08/28/20 15:27
92493167004	**HZ-2**	Water	08/28/20 10:05	08/28/20 15:27
92493167005	**HZ-3**	Water	08/28/20 11:00	08/28/20 15:27
92493167006	**HZ-4**	Water	08/28/20 11:35	08/28/20 15:27

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SAMPLE ANALYTE COUNT

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92493167001	**SW-1**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493167002	**HZ-1**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493167003	**SW-2**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493167004	**HZ-2**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493167005	**HZ-3**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A
92493167006	**HZ-4**	EPA 6010D	SH1	6	PASI-A
		EPA 6020B	BG2, JOR	4	PASI-A
		SM 2320B-2011	ECH	2	PASI-A
		EPA 9056A	CDC	2	PASI-A

PASI-A = Pace Analytical Services - Asheville

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Huntersville, NC 28078
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SUMMARY OF DETECTION

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92493167001	**SW-1**					
EPA 6010D	Boron	46.3J	ug/L	50.0	09/03/20 22:39	BC
EPA 6010D	Calcium	28400	ug/L	100	09/03/20 22:39	
EPA 6010D	Magnesium	16600	ug/L	100	09/03/20 22:39	
EPA 6020B	Cobalt	2.8	ug/L	0.10	09/03/20 15:09	
EPA 6020B	Potassium	1800	ug/L	250	09/04/20 15:40	
EPA 6020B	Sodium	11300	ug/L	5000	09/04/20 16:44	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	119	mg/L	5.0	09/04/20 22:38	
EPA 9056A	Chloride	9.2	mg/L	1.0	09/02/20 16:06	
EPA 9056A	Sulfate	38.1	mg/L	1.0	09/02/20 16:06	
92493167002	**HZ-1**					
EPA 6010D	Boron	414	ug/L	50.0	09/03/20 22:42	BC
EPA 6010D	Calcium	73600	ug/L	100	09/03/20 22:42	
EPA 6010D	Magnesium	28800	ug/L	100	09/03/20 22:42	
EPA 6010D	Nickel	14.9	ug/L	5.0	09/03/20 22:42	
EPA 6020B	Cobalt	99.4	ug/L	1.0	09/04/20 15:44	
EPA 6020B	Lithium	1.0J	ug/L	2.5	09/03/20 15:13	
EPA 6020B	Potassium	7290	ug/L	500	09/04/20 15:44	
EPA 6020B	Sodium	27300	ug/L	12500	09/04/20 16:48	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	54.8	mg/L	5.0	09/04/20 22:48	
EPA 9056A	Chloride	8.3	mg/L	1.0	09/02/20 16:21	
EPA 9056A	Sulfate	299	mg/L	4.0	09/02/20 18:05	
92493167003	**SW-2**					
EPA 6010D	Boron	804	ug/L	50.0	09/03/20 22:46	BC
EPA 6010D	Calcium	61900	ug/L	100	09/03/20 22:46	
EPA 6010D	Magnesium	27300	ug/L	100	09/03/20 22:46	
EPA 6020B	Cobalt	0.48	ug/L	0.10	09/03/20 15:16	
EPA 6020B	Potassium	2100	ug/L	250	09/04/20 15:55	
EPA 6020B	Sodium	38400	ug/L	25000	09/04/20 16:52	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	148	mg/L	5.0	09/04/20 22:57	
EPA 9056A	Chloride	13.1	mg/L	1.0	09/02/20 16:36	
EPA 9056A	Sulfate	174	mg/L	2.0	09/02/20 18:50	
92493167004	**HZ-2**					
EPA 6010D	Boron	262	ug/L	50.0	09/03/20 22:49	BC
EPA 6010D	Calcium	19800	ug/L	100	09/03/20 22:49	
EPA 6010D	Magnesium	11100	ug/L	100	09/03/20 22:49	
EPA 6010D	Nickel	6.4	ug/L	5.0	09/03/20 22:49	
EPA 6020B	Cobalt	11.3	ug/L	0.10	09/03/20 15:20	
EPA 6020B	Lithium	4.6	ug/L	2.5	09/03/20 15:20	
EPA 6020B	Potassium	3900	ug/L	500	09/04/20 15:59	
EPA 6020B	Sodium	15400	ug/L	7500	09/04/20 16:55	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	49.8	mg/L	5.0	09/08/20 14:18	
EPA 9056A	Chloride	6.9	mg/L	1.0	09/02/20 16:50	
EPA 9056A	Sulfate	53.2	mg/L	1.0	09/02/20 16:50	M1
92493167005	**HZ-3**					
EPA 6010D	Boron	113	ug/L	50.0	09/03/20 22:52	BC

REPORT OF LABORATORY ANALYSIS

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

SUMMARY OF DETECTION

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Lab Sample ID / Method	Client Sample ID / Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
92493167005	**HZ-3**					
EPA 6010D	Calcium	10400	ug/L	100	09/03/20 22:52	
EPA 6010D	Magnesium	6200	ug/L	100	09/03/20 22:52	
EPA 6010D	Nickel	7.0	ug/L	5.0	09/03/20 22:52	
EPA 6020B	Cobalt	27.5	ug/L	0.50	09/04/20 16:03	
EPA 6020B	Lithium	8.4	ug/L	2.5	09/03/20 15:24	
EPA 6020B	Potassium	6340	ug/L	1000	09/04/20 16:59	
EPA 6020B	Sodium	6990	ug/L	5000	09/04/20 16:59	
EPA 9056A	Chloride	1.8	mg/L	1.0	09/02/20 17:35	
EPA 9056A	Sulfate	70.0	mg/L	1.0	09/02/20 17:35	
92493167006	**HZ-4**					
EPA 6010D	Boron	369	ug/L	50.0	09/03/20 22:55	BC
EPA 6010D	Calcium	34600	ug/L	100	09/03/20 22:55	
EPA 6010D	Magnesium	30500	ug/L	100	09/03/20 22:55	
EPA 6010D	Molybdenum	4.6J	ug/L	5.0	09/03/20 22:55	
EPA 6010D	Nickel	25.7	ug/L	5.0	09/03/20 22:55	
EPA 6020B	Cobalt	50.3	ug/L	0.50	09/04/20 16:06	
EPA 6020B	Lithium	46.6	ug/L	12.5	09/04/20 16:06	
EPA 6020B	Potassium	25600	ug/L	2500	09/07/20 22:50	
EPA 6020B	Sodium	24300	ug/L	12500	09/07/20 22:50	
SM 2320B-2011	Alkalinity,Bicarbonate (CaCO3)	82.2	mg/L	5.0	09/08/20 14:51	
EPA 9056A	Chloride	8.6	mg/L	1.0	09/02/20 17:50	
EPA 9056A	Sulfate	32.7	mg/L	1.0	09/02/20 17:50	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: SW-1 **Lab ID: 92493167001** Collected: 08/28/20 09:30 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**46.3J**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:39	7440-42-8	BC
Calcium	**28400**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:39	7440-70-2	
Magnesium	**16600**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:39	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:39	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:39	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:39	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**2.8**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 15:09	7440-48-4	
Lithium	ND	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 15:09	7439-93-2	
Potassium	**1800**	ug/L	250	45.0	5	09/03/20 00:51	09/04/20 15:40	7440-09-7	
Sodium	**11300**	ug/L	5000	982	20	09/03/20 00:51	09/04/20 16:44	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**119**	mg/L	5.0	5.0	1		09/04/20 22:38		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:38		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**9.2**	mg/L	1.0	0.60	1		09/02/20 16:06	16887-00-6	
Sulfate	**38.1**	mg/L	1.0	0.50	1		09/02/20 16:06	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: HZ-1 **Lab ID: 92493167002** Collected: 08/28/20 09:40 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**414**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:42	7440-42-8	BC
Calcium	**73600**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:42	7440-70-2	
Magnesium	**28800**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:42	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:42	7439-98-7	
Nickel	**14.9**	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:42	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:42	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**99.4**	ug/L	1.0	0.50	10	09/03/20 00:51	09/04/20 15:44	7440-48-4	
Lithium	**1.0J**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 15:13	7439-93-2	
Potassium	**7290**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:44	7440-09-7	
Sodium	**27300**	ug/L	12500	2450	50	09/03/20 00:51	09/04/20 16:48	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**54.8**	mg/L	5.0	5.0	1		09/04/20 22:48		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:48		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**8.3**	mg/L	1.0	0.60	1		09/02/20 16:21	16887-00-6	
Sulfate	**299**	mg/L	4.0	2.0	4		09/02/20 18:05	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: SW-2 **Lab ID: 92493167003** Collected: 08/28/20 10:20 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**804**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:46	7440-42-8	BC
Calcium	**61900**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:46	7440-70-2	
Magnesium	**27300**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:46	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:46	7439-98-7	
Nickel	ND	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:46	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:46	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**0.48**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 15:16	7440-48-4	
Lithium	ND	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 15:16	7439-93-2	
Potassium	**2100**	ug/L	250	45.0	5	09/03/20 00:51	09/04/20 15:55	7440-09-7	
Sodium	**38400**	ug/L	25000	4910	100	09/03/20 00:51	09/04/20 16:52	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**148**	mg/L	5.0	5.0	1		09/04/20 22:57		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/04/20 22:57		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**13.1**	mg/L	1.0	0.60	1		09/02/20 16:36	16887-00-6	
Sulfate	**174**	mg/L	2.0	1.0	2		09/02/20 18:50	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: HZ-2 **Lab ID: 92493167004** Collected: 08/28/20 10:05 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**262**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:49	7440-42-8	BC
Calcium	**19800**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:49	7440-70-2	
Magnesium	**11100**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:49	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:49	7439-98-7	
Nickel	**6.4**	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:49	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:49	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**11.3**	ug/L	0.10	0.050	1	09/03/20 00:51	09/03/20 15:20	7440-48-4	
Lithium	**4.6**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 15:20	7439-93-2	
Potassium	**3900**	ug/L	500	89.9	10	09/03/20 00:51	09/04/20 15:59	7440-09-7	
Sodium	**15400**	ug/L	7500	1470	30	09/03/20 00:51	09/04/20 16:55	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**49.8**	mg/L	5.0	5.0	1		09/08/20 14:18		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/08/20 14:18		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**6.9**	mg/L	1.0	0.60	1		09/02/20 16:50	16887-00-6	
Sulfate	**53.2**	mg/L	1.0	0.50	1		09/02/20 16:50	14808-79-8	M1

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: HZ-3 **Lab ID: 92493167005** Collected: 08/28/20 11:00 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**113**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:52	7440-42-8	BC
Calcium	**10400**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:52	7440-70-2	
Magnesium	**6200**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:52	7439-95-4	
Molybdenum	ND	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:52	7439-98-7	
Nickel	**7.0**	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:52	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:52	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**27.5**	ug/L	0.50	0.25	5	09/03/20 00:51	09/04/20 16:03	7440-48-4	
Lithium	**8.4**	ug/L	2.5	0.39	1	09/03/20 00:51	09/03/20 15:24	7439-93-2	
Potassium	**6340**	ug/L	1000	180	20	09/03/20 00:51	09/04/20 16:59	7440-09-7	
Sodium	**6990**	ug/L	5000	982	20	09/03/20 00:51	09/04/20 16:59	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/09/20 09:21		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/09/20 09:21		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**1.8**	mg/L	1.0	0.60	1		09/02/20 17:35	16887-00-6	
Sulfate	**70.0**	mg/L	1.0	0.50	1		09/02/20 17:35	14808-79-8	

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ANALYTICAL RESULTS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Sample: HZ-4 **Lab ID: 92493167006** Collected: 08/28/20 11:35 Received: 08/28/20 15:27 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 Pace Analytical Services - Asheville								
Boron	**369**	ug/L	50.0	32.4	1	09/03/20 01:20	09/03/20 22:55	7440-42-8	BC
Calcium	**34600**	ug/L	100	94.2	1	09/03/20 01:20	09/03/20 22:55	7440-70-2	
Magnesium	**30500**	ug/L	100	67.8	1	09/03/20 01:20	09/03/20 22:55	7439-95-4	
Molybdenum	**4.6J**	ug/L	5.0	3.9	1	09/03/20 01:20	09/03/20 22:55	7439-98-7	
Nickel	**25.7**	ug/L	5.0	3.5	1	09/03/20 01:20	09/03/20 22:55	7440-02-0	
Silver	ND	ug/L	5.0	2.5	1	09/03/20 01:20	09/03/20 22:55	7440-22-4	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A Pace Analytical Services - Asheville								
Cobalt	**50.3**	ug/L	0.50	0.25	5	09/03/20 00:51	09/04/20 16:06	7440-48-4	
Lithium	**46.6**	ug/L	12.5	2.0	5	09/03/20 00:51	09/04/20 16:06	7439-93-2	
Potassium	**25600**	ug/L	2500	450	50	09/03/20 00:51	09/07/20 22:50	7440-09-7	
Sodium	**24300**	ug/L	12500	2450	50	09/03/20 00:51	09/07/20 22:50	7440-23-5	
2320B Alkalinity	Analytical Method: SM 2320B-2011 Pace Analytical Services - Asheville								
Alkalinity,Bicarbonate (CaCO3)	**82.2**	mg/L	5.0	5.0	1		09/08/20 14:51		
Alkalinity,Carbonate (CaCO3)	ND	mg/L	5.0	5.0	1		09/08/20 14:51		
9056 IC anions 28 Days	Analytical Method: EPA 9056A Pace Analytical Services - Asheville								
Chloride	**8.6**	mg/L	1.0	0.60	1		09/02/20 17:50	16887-00-6	
Sulfate	**32.7**	mg/L	1.0	0.50	1		09/02/20 17:50	14808-79-8	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

QC Batch: 564173
QC Batch Method: EPA 3010A
Analysis Method: EPA 6010D
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

METHOD BLANK: 2990748 Matrix: Water
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Boron	ug/L	35.2J	50.0	32.4	09/03/20 21:40	BC
Calcium	ug/L	ND	100	94.2	09/03/20 21:40	
Magnesium	ug/L	ND	100	67.8	09/03/20 21:40	
Molybdenum	ug/L	ND	5.0	3.9	09/03/20 21:40	
Nickel	ug/L	ND	5.0	3.5	09/03/20 21:40	
Silver	ug/L	ND	5.0	2.5	09/03/20 21:40	

LABORATORY CONTROL SAMPLE: 2990749

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	513	103	80-120	
Calcium	ug/L	5000	4870	97	80-120	
Magnesium	ug/L	5000	4940	99	80-120	
Molybdenum	ug/L	500	500	100	80-120	
Nickel	ug/L	500	501	100	80-120	
Silver	ug/L	250	246	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990750 2990751

Parameter	Units	92493164001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	310	500	500	841	831	106	104	75-125	1	20	
Calcium	ug/L	67100	5000	5000	72100	71400	101	87	75-125	1	20	
Magnesium	ug/L	12100	5000	5000	17200	16900	102	97	75-125	1	20	
Molybdenum	ug/L	7.9	500	500	530	522	104	103	75-125	1	20	
Nickel	ug/L	ND	500	500	507	501	101	100	75-125	1	20	
Silver	ug/L	ND	250	250	260	255	104	102	75-125	2	20	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

QC Batch: 564174 | Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A | Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

METHOD BLANK: 2990752 Matrix: Water
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Cobalt	ug/L	ND	0.10	0.050	09/03/20 14:05	
Lithium	ug/L	ND	2.5	0.39	09/03/20 14:05	
Potassium	ug/L	ND	50.0	9.0	09/03/20 14:05	
Sodium	ug/L	ND	250	49.1	09/03/20 14:05	

LABORATORY CONTROL SAMPLE: 2990753

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cobalt	ug/L	10	10.5	105	80-120	
Lithium	ug/L	50	53.9	108	80-120	
Potassium	ug/L	625	640	102	80-120	
Sodium	ug/L	625	654	105	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2990754 2990755

Parameter	Units	92493164002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	0.17	10	10	10.6	10.6	105	104	75-125	0	20	
Lithium	ug/L	0.70J	50	50	51.1	50.3	101	99	75-125	2	20	
Potassium	ug/L	3200	625	625	3870	3860	107	104	75-125	0	20	
Sodium	ug/L	59200	625	625	58800	58500	-56	-99	75-125	0	20	M6

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

QC Batch: 564261 | Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493167001, 92493167002, 92493167003

METHOD BLANK: 2990998 Matrix: Water
Associated Lab Samples: 92493167001, 92493167002, 92493167003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	5.0	5.0	09/04/20 19:15	
Alkalinity,Carbonate (CaCO3)	mg/L	ND	5.0	5.0	09/04/20 19:15	

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QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

QC Batch: 564905 | Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 | Analysis Description: 2320B Alkalinity
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493167004, 92493167005, 92493167006

METHOD BLANK: 2994267 Matrix: Water
Associated Lab Samples: 92493167004, 92493167005, 92493167006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity,Bicarbonate (CaCO3)	mg/L	ND	5.0	5.0	09/08/20 14:04	
Alkalinity,Carbonate (CaCO3)	mg/L	ND	5.0	5.0	09/08/20 14:04	

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

QUALITY CONTROL DATA

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

QC Batch: 564027 | Analysis Method: EPA 9056A
QC Batch Method: EPA 9056A | Analysis Description: 9056 IC anions 28 Days
Laboratory: Pace Analytical Services - Asheville
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

METHOD BLANK: 2989816 Matrix: Water
Associated Lab Samples: 92493167001, 92493167002, 92493167003, 92493167004, 92493167005, 92493167006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	0.60	09/02/20 12:52	
Sulfate	mg/L	ND	1.0	0.50	09/02/20 12:52	

LABORATORY CONTROL SAMPLE: 2989817

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	50	51.7	103	90-110	
Sulfate	mg/L	50	52.4	105	90-110	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2989818 2989819

Parameter	Units	92493164001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	11.3	50	50	62.3	62.3	102	102	90-110	0	10	
Sulfate	mg/L	13.4	50	50	63.8	63.9	101	101	90-110	0	10	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2989820 2989821

Parameter	Units	92493167004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	6.9	50	50	56.4	56.6	99	99	90-110	0	10	
Sulfate	mg/L	53.2	50	50	97.7	97.7	89	89	90-110	0	10	M1

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(704)875-9092

QUALIFIERS

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

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.

ANALYTE QUALIFIERS

BC	The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the laboratory reporting limit.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
M6	Matrix spike and Matrix spike duplicate recovery not evaluated against control limits due to sample dilution.

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Huntersville, NC 28078
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Bremo PS NES-ACM (B)
Pace Project No.: 92493167

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92493167001	**SW-1**	EPA 3010A	564173	EPA 6010D	564195
92493167002	**HZ-1**	EPA 3010A	564173	EPA 6010D	564195
92493167003	**SW-2**	EPA 3010A	564173	EPA 6010D	564195
92493167004	**HZ-2**	EPA 3010A	564173	EPA 6010D	564195
92493167005	**HZ-3**	EPA 3010A	564173	EPA 6010D	564195
92493167006	**HZ-4**	EPA 3010A	564173	EPA 6010D	564195
92493167001	**SW-1**	EPA 3010A	564174	EPA 6020B	564191
92493167002	**HZ-1**	EPA 3010A	564174	EPA 6020B	564191
92493167003	**SW-2**	EPA 3010A	564174	EPA 6020B	564191
92493167004	**HZ-2**	EPA 3010A	564174	EPA 6020B	564191
92493167005	**HZ-3**	EPA 3010A	564174	EPA 6020B	564191
92493167006	**HZ-4**	EPA 3010A	564174	EPA 6020B	564191
92493167001	**SW-1**	SM 2320B-2011	564261		
92493167002	**HZ-1**	SM 2320B-2011	564261		
92493167003	**SW-2**	SM 2320B-2011	564261		
92493167004	**HZ-2**	SM 2320B-2011	564905		
92493167005	**HZ-3**	SM 2320B-2011	564905		
92493167006	**HZ-4**	SM 2320B-2011	564905		
92493167001	**SW-1**	EPA 9056A	564027		
92493167002	**HZ-1**	EPA 9056A	564027		
92493167003	**SW-2**	EPA 9056A	564027		
92493167004	**HZ-2**	EPA 9056A	564027		
92493167005	**HZ-3**	EPA 9056A	564027		
92493167006	**HZ-4**	EPA 9056A	564027		

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CHAIN-OF-CUSTODY Analytical Request Document

Pace Analytical®

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorc

WO# : 92493167

92493167

ALL SHADED

Company: Golder Associates Inc.	Billing Information: 20139823
Address: 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227	
Report To: Amanda Reynolds/Mike Williams Nicole Gasiorowski nicole.gasiorowski@pacelabs.com	Email To: areynolds@golder.com/Martha_Smith@golder.com
Copy To: Martha Smith	Site Collection Info/Address: Bremo Power Station
Customer Project Name/Number: Bremo NP NES-ACM Sampling	State: VA / County/City: Bremo Bluff / Time Zone Collected: [ ]PT [ ]MT [ ]CT [X]ET
Phone: 804-258-2398 Email: areynolds@golder.com	Site/Facility ID #: Bremo Power Station / Compliance Monitoring? [ ] Yes [X] No
Collected By (print): M. Taylor ~~/C. Joyner~~	Purchase Order # : 20139823 / Quote #: / DW PWS ID #: / DW Location Code:
Collected By (signature): M. Jaylor	Turnaround Date Required: Standard / Immediately Packed on Ice: [X] Yes [ ] No
Sample Disposal: [ ] Dispose as appropriate [ ] Return [ ] Archive: _____ [X] Hold: 3 Months	Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedited 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	U	U								

** 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 _____ (O1) Other 1 _____

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	Analyses: 6010/6020 Metals (B, Ca, Mg, Na, K, Co, Li; Mo, Ag, Ni)	Analyses: 9056 Anions (Chloride, Sulfate)	Analyses: SM2320B Alkalinity as CaCO3	Lab Profile/Line:
SW-1	SW	G	8/28/2020	0930			N	3	X	X	X	* all bottles preserved 001
HZ-1	SW	G	8/28/2020	0940			N	3	X	X	X	on ice * 002
SW-2	SW	G	8/28/2020	1020			N	3	X	X	X	* please run alkalinity from 003
HZ-2	SW	G	8/28/2020	1005			N	3	X	X	X	anions bottle wave; minimum 004
HZ-3	SW	G	8/28/2020	1100		MT	N	3	X	X	X	volume collected (all HZ samples) *005
HZ-4	SW	G	8/28/2020	1135			N	3	X	X	X	matrix: SW = surface water 006

Lab Profile/Line:

Lab Sample Receipt Checklist:
- Custody Seals Present/Intact: ✓ N NA
- Custody Signatures Present: ✓ N NA
- Collector Signature Present: ✓ N NA
- Bottles Intact: ✓ N NA
- Correct Bottles: ✓ N NA
- Sufficient Volume: ✓ N NA
- Samples Received on Ice: ✓ N NA
- VOA - Headspace Acceptable: Y N ✓NA
- USDA Regulated Soils: Y N ✓NA
- Samples in Holding Time: ✓ N NA
- Residual Chlorine Present: Y N ✓NA
- Cl Strips: _____
- Sample pH Acceptable: ✓ N NA
- pH Strips: 232518V
- Sulfide Present: Y N ✓NA
- Lead Acetate Strips: _____

LAB USE ONLY:
Lab Sample # / Comments:

92493167

Customer Remarks / Special Conditions / Possible Hazards: All samples immediately preserved on ice. Level II Reporting package requested. See sample memo, Reporting Group B for more details. NP NES SW/HZ

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 #:

Samples received via: FEDEX UPS Client Courier Pace Courier

LAB Sample Temperature Info:
- Temp Blank Received: Y N NA
- Therm ID#: T-3
- Cooler 1 Temp Upon Receipt: 3.0 °C
- Cooler 1 Therm Corr. Factor: 0.0 °C
- Cooler 1 Corrected Temp: 3.0 °C
- Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Moira Jaylor / Golder	8/25/2020 1527	Rachel Burruss	8-28-20 1527
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: 1 of: 1

Appendix G

Data Validation Forms

Project Name: Bremo Power Station - North Pond NES Addendum - Groundwater

Project Reference Number: 20139823.800C

Sampling Event Date: August 27-28, 2020

Review Date: 09/25/2020 *Initials:* ALR

Review Date: 10/02/2020 *Initials:* RMS

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 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: Boron, Calcium, Magnesium, Molybdenum, Nickel, Silver, Cobalt, Lithium, Potassium, Sodium, Alkalinity, Chloride, Sulfate

Note: Pace Project Nos: 92492415, 92493164

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Richmond, Virginia, USA 23227
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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, Sulfate	28 days
EPA 6000 series	Metals	6 months
SM2320B	Alkalinity	6 months

Notes:_____

3.0 LABORATORY QUALITY CONTROL REVIEW

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

See Note 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 recommended.

Parameter	Method Blank Detection (µg/L)	Batch	Associated Qualified Sample(s)	Validator Qualifier
Boron	35.2 J	564173	MW-22D, MW-23D, MW-36D, Duplicate-NP NES	J+

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

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

Notes: _____

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

NA 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	QC Batch	MS/MSD Batch ID	Associated Qualified Sample(s)	Validator Qualifier
Sodium	MS, MSD	564174	2990754/2990755	--	--
Sulfate	MS, MSD	564027	2989820/2989821	--	--
Chloride	MS, MSD, RPD	453430	2477819/2477820	--	--
Sodium	MS	562977	2985457/2985458	--	--
Potassium	MS, MSD	564767	2993786/2993787	--	--
Sodium	MS, MSD	564767	2993786/2993787	--	--
Sodium	MS, MSD	564767	2993788/2993789		
Alkalinity	MSD	564261	2991000/2991001	--	--

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

NA Radiological samples reported below their respective MDC have been qualified with a “U.”

Notes: _____

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

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

NA 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.

6.0 DATA REPORTING

NA 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: _____

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: _____

Project Name: Bremo Power Station - North Pond NES Addendum - SW/HZ

Project Reference Number: 20139823.800C

Sampling Event Date: August 28, 2020

Review Date: 09/25/2020 *Initials:* ALR

Review Date: 10/02/2020 *Initials:* RMS

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 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.

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- 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: Boron, Calcium, Magnesium, Molybdenum, Nickel, Silver, Cobalt, Lithium, Potassium, Sodium, Alkalinity, Chloride, Sulfate

Note: Pace Project No: 92493167

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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, Sulfate	28 days
EPA 6000 series	Metals	6 months
SM2320B	Alkalinity	6 months

Notes:_____

3.0 LABORATORY QUALITY CONTROL REVIEW

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

See Note 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 recommended.

Parameter	Method Blank Detection (µg/L)	Batch	Associated Qualified Sample(s)	Validator Qualifier
Boron*	35.2 J	564173	SW-1*, HZ-2*, HZ-3*	J+

*As boron had not been previously analyzed for these samples, results less than 10x the method blank concentration were qualified as estimated high (J+) as no historical data was available.

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

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

Notes: _____

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

NA 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	QC Batch	MS/MSD Batch ID	Associated Qualified Sample(s)	Validator Qualifier
Sodium	MS, MSD	564174	2990754/2990755	--	--
Sulfate	MS, MSD	564027	2989820/2989821	--	--
Sodium	MS	562977	2985457/2985458	--	--
Alkalinity	MSD	564261	2991000/2991001	--	--

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

NA Radiological samples reported below their respective MDC have been qualified with a “U.”

Notes: _____

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

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

NA 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.

6.0 DATA REPORTING

NA 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: _____

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: _____

Appendix H

Baseline Quantitative Human Health Risk Assessment

VURAM Output

Virginia Department of Environmental Quality

VURAM

Virginia Unified Risk Assessment Model

VERSION: 2.2

Construction Worker Quantitative Risk Assessment Report

Site Name: Bremo - North Pond

Program: Solid Waste

Total Hazard Index/Risk for All Media

Non-Cancer Adult	Cancer
Total: 8.68E-03	**Total: 0.00E+00**
does not exceed hazard index	***does not exceed cumulative risk***

Risk Based Performance Criteria

Default Hazard Index	Default Cumulative Risk-All Chemicals
1	**1.00E-04**

Contact Depth to Groundwater: Direct Less than 15ft

All Report Pages are Required for Risk Assessment Submission
DETAILED REPORT FOLLOWS

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Analyte: Boron And Borates Only
CAS: 7440-42-8

Concentration ug/L :	1.30E+03
RfDo:	2.00E-01
RfCi:	2.00E-02
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	5.80E-04	Ingestion:	
Dermal:	4.09E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**9.90E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 11.41% 0.00%

Analyte: Cobalt
CAS: 7440-48-4

Concentration ug/L :	6.19E+01
RfDo:	3.00E-03
RfCi:	2.00E-05
SFO:	
IUR:	9.00E-03
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	1.84E-03	Ingestion:	
Dermal:	5.20E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**2.36E-03**	**Total:**	**0.00E+00**

% Contribution to Media Risk 27.23% 0.00%

Analyte: Lithium
CAS: 7439-93-2

Concentration ug/L :	4.51E+01
RfDo:	2.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	2.01E-03	Ingestion:	
Dermal:	1.42E-03	Dermal:	
Inhalation:		Inhalation:	
Total:	**3.43E-03**	**Total:**	**0.00E+00**

% Contribution to Media Risk 39.58% 0.00%

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Analyte: Molybdenum
CAS: 7439-98-7

Concentration ug/L :	1.68E+01
RfDo:	5.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	3.00E-04	Ingestion:	
Dermal:	2.12E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**5.12E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 5.90% 0.00%

Analyte: Nickel Soluble Salts
CAS: 7440-02-0

Concentration ug/L :	9.90E+00
RfDo:	2.00E-02
RfCi:	2.00E-04
SFO:	
IUR:	2.60E-04
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	4.42E-05	Ingestion:	
Dermal:	1.56E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**2.00E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 2.31% 0.00%

Analyte: Silver
CAS: 7440-22-4

Concentration ug/L :	5.70E+00
RfDo:	5.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	1.02E-04	Ingestion:	
Dermal:	1.08E-03	Dermal:	
Inhalation:		Inhalation:	
Total:	**1.18E-03**	**Total:**	**0.00E+00**

% Contribution to Media Risk 13.59% 0.00%

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Total Calculated Hazard Index/Risk For Media: Groundwater

Non-Cancer Adult		Cancer	
Ingestion:	4.88E-03	Ingestion:	0.00E+00
Dermal:	3.79E-03	Dermal:	0.00E+00
Inhalation:	0.00E+00	Inhalation:	0.00E+00
Total:	**8.68E-03**	**Total:**	**0.00E+00**

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Total Hazard Index/Risk for All Media

Non-Cancer Adult

Ingestion:	4.88E-03
Dermal:	3.79E-03
Inhalation:	0.00E+00
Total:	**8.68E-03**

does not exceed hazard index

Cancer

Ingestion:	0.00E+00
Dermal:	0.00E+00
Inhalation:	0.00E+00
Total:	**0.00E+00**

does not exceed cumulative risk

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Construction Exposure Default Values

Symbol	Description	Value	Units
A	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	14.0111	(unitless)
AFcw	Construction Worker Soil Adherence Factor	0.3	(mg/cm2)
As	Areal extent of the site or contamination	0.5	(acres)
ATcw	Construction Worker Averaging Time: 365 x LT	25550	(days)
ATcw-a	Construction Worker Averaging Time: EWcw x 7 x EDcw	350	(days)
B	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	19.6154	(unitless)
BWcw	Construction Worker Body Weight	80	(kg)
C	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	225.3397	(unitless)
DWcw	Construction Worker Days Worked	5	(days/week)
EDcw	Construction Worker Exposure Duration	1	(yrs)
EFcw	Construction Worker Exposure Frequency	250	(days/yrs)
EFcw-vrp	Construction Worker Soil Exposure Frequency - VRP ONLY - Virginia DEQ	125	(days/yr)
ETcw	Construction Worker Exposure Time	8	(hrs/day)
EWcw	Construction Worker Weeks Worked	50	(weeks/yr)
F(x)	Function Dependent on 0.886 × (Ut/Um)	0.194	(unitless)
Fd	Dispersion Correction Factor	0.185	(unitless)
IRcw	Construction Worker Soil Ingestion Rate	330	(mg/day)
n	Total soil porosity: 1-(ρb/ρs)	0.433962264150943	(unitless)
PEFsc	Particulate Emission Factor Subchronic - Virginia DEQ calculated	1266503136.97919	(m3/kg)
RfCsc	Subchronic Inhalation Reference Concentration		(mg/m3)
RfDosc	Subchronic Oral Reference Dose		(mg/kg-day)
SAcw	Construction Worker Surface Area	3527	(cm2/day)
Tc	Total time over which construction occurs: EDcw*EWcw*7days/wk*24hrs/day*3600s/hr	30240000	(s)

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

TR-ACH	Trench Air Changes per Hour - Virginia DEQ	2	(h)-1
TR-ACvad	Trench Advection Coefficient Groundwater greater than 15ft - Virginia DEQ	0.25	(cm3/cm3)
TR-D-dir	Trench Depth - groundwater less Than 15ft - Virginia DEQ	2.44	(m)
TR-D-ind	Trench Depth - groundwater greater than 15ft - Virginia DEQ	4.57	(m)
TR-Dsg	Trench - Depth to soil gas vapor source - Virginia DEQ	1	(cm)
TR-EFcw	Trench Construction Worker Exposure Frequency - Virginia DEQ	125	(days/yr)
TR-ETcw	Trench Construction Worker Exposure Time - Virginia DEQ	4	(hrs/day)
TR-EVcw	Trench Construction Worker Events - Virginia DEQ	1	(events/day)
TR-F	Trench Fraction of floor through which contaminant can enter - Virginia DEQ	1	(unitless)
TR-HV	Trench Thickness of Vadose Zone - groundwater greater than 15 ft - Virginia DEQ	30	(cm)
TR-IRcw	Trench Construction Worker Groundwater Ingestion Rate - Virginia DEQ	0.02	(L/day)
TR-KGH2O	Trench Gas-phase mass transfer coefficient of water vapor at 25deg C - Virginia DEQ	0.833	(cm/s)
TR-KLO2	Trench Liquid-phase mass transfer coefficient of oxygen at 25deg C - Virginia DEQ	0.002	(cm/s)
TR-L	Trench Length - Virginia DEQ	2.44	(m)
TR-Lgw	Trench Depth to groundwater - Virginia DEQ	488	(cm)
TR-MWH2O	Trench Molecular Weight of Water - Virginia DEQ	18	(unitless)
TR-MWO2	Trench Molecular Weight of Oxygen - Virginia DEQ	32	(unitless)
TR-Porvad	Trench Porosity in Vadose Zone - groundwater greater than 15ft - Virginia DEQ	0.44	(cm3/cm3)
TR-R	Trench Ideal Gas Constant - Virginia DEQ	0.000082	(atm-m3/mol-K)
TR-Temp-F	Trench Temperature Fahrenheit - Virginia DEQ	77	(F)
TR-Temp-K	Trench Temperature - Virginia DEQ	298	(K)
TR-W	Trench Width - Virginia DEQ	0.91	(m)
TR-W/D	Trench Width to Depth Ratio - Virginia DEQ	0.38	(unitless)
Um	Mean Annual Wind Speed	4.69	(m/s)
Ut	Equivalent Threshold Value of Wind Speed at 7m	11.32	(m/s)
V	V Fraction of Vegetative Cover	0.5	(unitless)

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Θa	Air filled soil porosity: n-Θw	0.133962264150943	(unitless)
Θw	Water filled soil porosity	0.3	(unitless)
ρb	Dry soil bulk density	1.5	(kg/L)
ρs	Soil particle density	2.65	(kg/L)

END OF REPORT

CHANGE

Appendix I

Corrective-Action-Endpoint Quantitative Human Health Risk Assessment VURAM Output

Virginia Department of Environmental Quality

VURAM

Virginia Unified Risk Assessment Model

VERSION: 2.2

Construction Worker Quantitative Risk Assessment Report

Site Name: Bremo - North Pond

Program: Solid Waste

Total Hazard Index/Risk for All Media

Non-Cancer Adult	Cancer
Total: 4.09E-03	**Total: 0.00E+00**
does not exceed hazard index	***does not exceed cumulative risk***

Risk Based Performance Criteria

Default Hazard Index	Default Cumulative Risk-All Chemicals
1	**1.00E-04**

Contact Depth to Groundwater: Direct Less than 15ft

All Report Pages are Required for Risk Assessment Submission
DETAILED REPORT FOLLOWS

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Analyte: Boron And Borates Only
CAS: 7440-42-8

Concentration ug/L :	2.50E+02
RfDo:	2.00E-01
RfCi:	2.00E-02
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	1.12E-04	Ingestion:	
Dermal:	7.87E-05	Dermal:	
Inhalation:		Inhalation:	
Total:	**1.90E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 4.66% 0.00%

Analyte: Cobalt
CAS: 7440-48-4

Concentration ug/L :	7.83E+00
RfDo:	3.00E-03
RfCi:	2.00E-05
SFO:	
IUR:	9.00E-03
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	2.33E-04	Ingestion:	
Dermal:	6.58E-05	Dermal:	
Inhalation:		Inhalation:	
Total:	**2.99E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 7.31% 0.00%

Analyte: Lithium
CAS: 7439-93-2

Concentration ug/L :	2.50E+01
RfDo:	2.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	1.12E-03	Ingestion:	
Dermal:	7.87E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**1.90E-03**	**Total:**	**0.00E+00**

% Contribution to Media Risk 46.59% 0.00%

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Analyte: Molybdenum
CAS: 7439-98-7

Concentration ug/L :	1.64E+01
RfDo:	5.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	2.93E-04	Ingestion:	
Dermal:	2.07E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**4.99E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 12.22% 0.00%

Analyte: Nickel Soluble Salts
CAS: 7440-02-0

Concentration ug/L :	7.90E+00
RfDo:	2.00E-02
RfCi:	2.00E-04
SFO:	
IUR:	2.60E-04
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	3.53E-05	Ingestion:	
Dermal:	1.24E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**1.60E-04**	**Total:**	**0.00E+00**

% Contribution to Media Risk 3.91% 0.00%

Analyte: Silver
CAS: 7440-22-4

Concentration ug/L :	5.00E+00
RfDo:	5.00E-03
RfCi:	
SFO:	
IUR:	
Mutagen:	
VOC:	

Calculated Hazard Quotient/Risk

Non-Cancer Adult		Cancer	
Ingestion:	8.93E-05	Ingestion:	
Dermal:	9.45E-04	Dermal:	
Inhalation:		Inhalation:	
Total:	**1.03E-03**	**Total:**	**0.00E+00**

% Contribution to Media Risk 25.31% 0.00%

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Groundwater

Total Calculated Hazard Index/Risk For Media: Groundwater

Non-Cancer Adult		Cancer	
Ingestion:	1.88E-03	Ingestion:	0.00E+00
Dermal:	2.21E-03	Dermal:	0.00E+00
Inhalation:	0.00E+00	Inhalation:	0.00E+00
Total:	**4.09E-03**	**Total:**	**0.00E+00**

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Total Hazard Index/Risk for All Media

Non-Cancer Adult		Cancer	
Ingestion:	1.88E-03	Ingestion:	0.00E+00
Dermal:	2.21E-03	Dermal:	0.00E+00
Inhalation:	0.00E+00	Inhalation:	0.00E+00
Total:	**4.09E-03**	**Total:**	**0.00E+00**
does not exceed hazard index		***does not exceed cumulative risk***	

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Construction Exposure Default Values

Symbol	Description	Value	Units
A	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	14.0111	(unitless)
AFcw	Construction Worker Soil Adherence Factor	0.3	(mg/cm2)
As	Areal extent of the site or contamination	0.5	(acres)
ATcw	Construction Worker Averaging Time: 365 x LT	25550	(days)
ATcw-a	Construction Worker Averaging Time: EWcw x 7 x EDcw	350	(days)
B	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	19.6154	(unitless)
BWcw	Construction Worker Body Weight	80	(kg)
C	Construction Worker Soil Inhalation Dispersion Constant - Virginia DEQ	225.3397	(unitless)
DWcw	Construction Worker Days Worked	5	(days/week)
EDcw	Construction Worker Exposure Duration	1	(yrs)
EFcw	Construction Worker Exposure Frequency	250	(days/yrs)
EFcw-vrp	Construction Worker Soil Exposure Frequency - VRP ONLY - Virginia DEQ	125	(days/yr)
ETcw	Construction Worker Exposure Time	8	(hrs/day)
EWcw	Construction Worker Weeks Worked	50	(weeks/yr)
F(x)	Function Dependent on 0.886 × (Ut/Um)	0.194	(unitless)
Fd	Dispersion Correction Factor	0.185	(unitless)
IRcw	Construction Worker Soil Ingestion Rate	330	(mg/day)
n	Total soil porosity: 1-(ρb/ρs)	0.433962264150943	(unitless)
PEFsc	Particulate Emission Factor Subchronic - Virginia DEQ calculated	1266503136.97919	(m3/kg)
RfCsc	Subchronic Inhalation Reference Concentration		(mg/m3)
RfDosc	Subchronic Oral Reference Dose		(mg/kg-day)
SAcw	Construction Worker Surface Area	3527	(cm2/day)
Tc	Total time over which construction occurs: EDcw*EWcw*7days/wk*24hrs/day*3600s/hr	30240000	(s)

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

TR-ACH	Trench Air Changes per Hour - Virginia DEQ	2	(h)-1
TR-ACvad	Trench Advection Coefficient Groundwater greater than 15ft - Virginia DEQ	0.25	(cm3/cm3)
TR-D-dir	Trench Depth - groundwater less Than 15ft - Virginia DEQ	2.44	(m)
TR-D-ind	Trench Depth - groundwater greater than 15ft - Virginia DEQ	4.57	(m)
TR-Dsg	Trench - Depth to soil gas vapor source - Virginia DEQ	1	(cm)
TR-EFcw	Trench Construction Worker Exposure Frequency - Virginia DEQ	125	(days/yr)
TR-ETcw	Trench Construction Worker Exposure Time - Virginia DEQ	4	(hrs/day)
TR-EVcw	Trench Construction Worker Events - Virginia DEQ	1	(events/day)
TR-F	Trench Fraction of floor through which contaminant can enter - Virginia DEQ	1	(unitless)
TR-HV	Trench Thickness of Vadose Zone - groundwater greater than 15 ft - Virginia DEQ	30	(cm)
TR-IRcw	Trench Construction Worker Groundwater Ingestion Rate - Virginia DEQ	0.02	(L/day)
TR-KGH2O	Trench Gas-phase mass transfer coefficient of water vapor at 25deg C - Virginia DEQ	0.833	(cm/s)
TR-KLO2	Trench Liquid-phase mass transfer coefficient of oxygen at 25deg C - Virginia DEQ	0.002	(cm/s)
TR-L	Trench Length - Virginia DEQ	2.44	(m)
TR-Lgw	Trench Depth to groundwater - Virginia DEQ	488	(cm)
TR-MWH2O	Trench Molecular Weight of Water - Virginia DEQ	18	(unitless)
TR-MWO2	Trench Molecular Weight of Oxygen - Virginia DEQ	32	(unitless)
TR-Porvad	Trench Porosity in Vadose Zone - groundwater greater than 15ft - Virginia DEQ	0.44	(cm3/cm3)
TR-R	Trench Ideal Gas Constant - Virginia DEQ	0.000082	(atm-m3/mol-K)
TR-Temp-F	Trench Temperature Fahrenheit - Virginia DEQ	77	(F)
TR-Temp-K	Trench Temperature - Virginia DEQ	298	(K)
TR-W	Trench Width - Virginia DEQ	0.91	(m)
TR-W/D	Trench Width to Depth Ratio - Virginia DEQ	0.38	(unitless)
Um	Mean Annual Wind Speed	4.69	(m/s)
Ut	Equivalent Threshold Value of Wind Speed at 7m	11.32	(m/s)
V	V Fraction of Vegetative Cover	0.5	(unitless)

Risk Based Performance Criteria

Default Hazard Index	Default Risk Individual Chemical	Default Cumulative Risk-All Chemicals
1	1.00E-06	1.00E-04

Contact Depth to Groundwater: Direct Less than 15ft

Θa	Air filled soil porosity: n-Θw	0.133962264150943	(unitless)
Θw	Water filled soil porosity	0.3	(unitless)
ρb	Dry soil bulk density	1.5	(kg/L)
ρs	Soil particle density	2.65	(kg/L)

END OF REPORT

CHANGE

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