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Submitted to:
Platte River Power Authority
Fort Collins, CO

Submitted by:
AECOM
Denver, CO
60605002
January 31, 2021

Platte River Power Authority Ash Monofill Annual Groundwater Monitoring and Corrective Action Report for 2020

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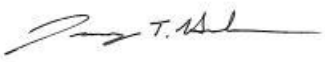

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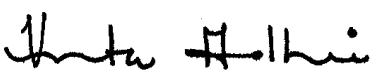

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Acronyms and Abbreviations

±	plus or minus
ACM	Assessment of Corrective Measure
AECOM	AECOM Technical Services, Inc.
bgs	below ground surface
CCR	Coal Combustion Residuals
CFR	Code of Federal Regulations
EROP	Engineering Report and Operational Plan
ft/day	foot per day
ft/ft	feet per foot
GWPS	groundwater protection standard
LCL	lower confidence limit
mg/L	milligrams per liter
PRPA	Platte River Power Authority
Site	Rawhide Energy Station (Rawhide Station)
SSI	statistically significant increase
SSL	statistically significant level
TDS	total dissolved solids
UPL	upper prediction limit

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 Introduction

This is the 2020 Annual Groundwater Monitoring and Corrective Action Report for the Coal Combustion Residuals (CCR) Ash Monofill at the Platte River Power Authority (PRPA) Rawhide Energy Station (Rawhide Station or Site) in Larimer County, Colorado. This report was developed by AECOM Technical Services, Inc. (AECOM) at the request of PRPA. The purpose of this report is to provide a summary of the groundwater monitoring activities performed at the Ash Monofill in 2020 to comply with the requirements of Title 40 of the Code of Federal Regulations (CFR) Part 257 Subpart D, known as the CCR Rule, which became effective on October 19, 2015. The rule provides standards for the disposal of CCR in landfills and surface impoundments (CCR units) and establishes groundwater monitoring requirements in 40 CFR 257.90 through 257.94. In accordance with 40 CFR 257.90(e), an annual report must document the status of the groundwater monitoring and correction action program (as applicable) for the CCR unit, summarize the key actions completed the previous year, describe any problems encountered, discuss actions taken to resolve the problems, and project key activities for the upcoming year. The annual report will be considered complete when it is placed in the facility operating record by January 31, 2021.

1.1 Report Organization

This Annual Report is divided into eight sections as outlined below and includes text, tables, figures, and appendices. The sections include:

- Section 1.0 includes this introduction and report organization;
- Section 2.0 provides a facility description that includes the facility location and operational history, a description of the CCR unit and a summary of the areal and site hydrogeology;
- Section 3.0 summarizes the groundwater monitoring and corrective action activities performed in 2020, and references appendices to this report that contain detailed documentation of those activities;
- Section 4.0 summarizes the groundwater sampling and analysis results;
- Section 5.0 provides the statistical analyses and results;
- Section 6.0 provides a projection of the key activities anticipated in 2021;
- Section 7.0 provides a summary of findings; and
- Section 8.0 provides a list of references cited in the report.

The report also includes three appendices that provide supporting documentation of the groundwater monitoring and related activities conducted in 2020 that include:

- Appendix A Groundwater Sampling Forms
- Appendix B Laboratory Analytical Reports and Data Validation Reports
- Appendix C Statistical Analysis Results

2.0 Facility Description

2.1 Facility Location and Operational History

The Rawhide Station encompasses approximately 4,560 acres north of Wellington in Larimer County, Colorado. In addition to the plant buildings, the major feature of the facility is an approximately 500-acre dry-land construction reservoir of reclaimed wastewater from the City of Fort Collins, also known as Hamilton Reservoir, which contains approximately 15,000 acre-feet of water and is used for cooling processes. The power block area contains the boiler and turbine buildings, the air quality control equipment, and the administrative offices. A rail spur along the northern edge of the Site connects the Rawhide Facility with the mainline of the Burlington Northern Santa Fe Railway Company Railway Company and is used to deliver coal and construction materials for plant operations. Six generating units are located at the Rawhide Station. Units A, B, C, D, and F are fueled by natural gas, and Unit 1 is fueled by coal from the Powder River Basin in Wyoming.

2.2 Ash Monofill Description

The Ash Monofill is located northwest of the main plant and north of Hamilton Reservoir. CCR solid waste from Unit 1 operations is disposed in the Ash Monofill which is comprised of two cells, Cell 1 and Cell 2, as shown on **Figure 1**. Cell 1 was operated from approximately 1980 to 2007 and is no longer in use. It is capped with cover soils but has not undergone final closure. Cell 2 is active, lies to the west of Cell 1, and is progressively advancing northwards as further ash material is placed within the cell.

2.3 Rawhide Station Hydrogeology

The hydrogeology of the Rawhide Station is discussed in the Engineering Report and Operational Plan (EROP) for the Solid Waste Disposal Facility (PRPA 1980), and in the Final Report Investigation of the Groundwater Monitoring Program for the Bottom Ash Disposal Site conducted by Lidstone and Anderson (1989). According to the 1980 EROP, hydrogeology of the Rawhide Station was originally investigated by drilling and installing 23 piezometers in conjunction with the original geotechnical investigation of the site prior to construction of the facility. Data from the piezometers indicated that a groundwater table exists within the weathered and fractured Pierre Shale bedrock beneath the Site, and in alluvial deposits along Coal Creek. The report indicated that the depth to groundwater varied across the Site from 11 to 67 feet below ground surface (bgs), with groundwater generally flowing to the south-southeast. The shallow water table, as explained in the 1980 EROP, was reported to be directly recharged by infiltration from precipitation and surface runoff.

Following construction and operation of the Rawhide Station, Lidstone and Anderson (1989) concluded that sufficient groundwater data were collected to determine that a mound had formed in the shallow, weathered, and fractured Pierre Shale in the vicinity of Hamilton Reservoir. After a review of available groundwater level information for Rawhide Station, AECOM concluded that the CCR units present at the Site are located hydraulically upgradient of any groundwater mound created by Hamilton Reservoir.

2.4 Ash Monofill Hydrogeology

The Ash Monofill is constructed within a narrow south-sloping valley with bedrock highs along both sides. The uppermost water-bearing stratum at the Ash Monofill was identified during groundwater monitoring well installation as the weathered and fractured Pierre Shale. Groundwater at the Ash Monofill is under water table conditions and, in 2020, lied at depths from approximately 16 to 33 feet bgs at wells located within the footprint of cell 2 in piezometers PZ-2 through PZ-6. Groundwater flow is generally from northwest to south-southeast, from the Ash Monofill towards Hamilton Reservoir, generally following the topographic slope of the valley.

3.0 Groundwater Monitoring Activities in 2020

This section summarizes groundwater monitoring activities conducted during 2020 to comply with the CCR Rule. Groundwater monitoring activities included:

- Measured groundwater levels at each monitoring well prior to purging and sampling to provide potentiometric data;
- Groundwater sampling and analysis of detection (Appendix III) and assessment (Appendix IV) monitoring constituents to identify potential releases from the Ash Monofill and to collect supplemental data to update the background statistics in the future; and
- Statistical analysis of the 2020 Appendix III detection and Appendix IV assessment monitoring data to determine if there were any statistically significant increases (SSIs) over background and whether any of the SSIs were above groundwater protection standards (GWPS) at a statistically significant level (SSL).

3.1 Water Level Measurements

During each monitoring event, groundwater levels were measured using an electronic water level meter. AECOM also measured the total depth of each monitoring well by lowering the meter sensor to the bottom of the well. Groundwater levels and total depth measurements were recorded to the nearest hundredth (0.01) of a foot. The water level meter cable and sensor were decontaminated at the start of field activities and after use at each well to limit the potential for cross-contamination between wells. Water level measurements were recorded on groundwater sampling forms, provided in **Appendix A**, and are tabulated in **Table 2** for the January, February, May, July, and October 2020 monitoring events.

3.2 Groundwater Sample Collection

Two rounds of semi-annual Appendix III detection monitoring and Appendix IV assessment monitoring groundwater samples were collected at the Ash Monofill wells (ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-06, ASH-07, and ASH-08) on April 10 to 20, 2020 and October 5 to 20, 2020. In addition, baseline detection and assessment monitoring was also conducted at wells ASH-02, ASH-06, ASH-07, and ASH-08 on January 15, 2020 and July 16-24, 2020. Four rounds (January, May, July, and October) of baseline data were collected at wells ASH-02, ASH-06, ASH-07, and ASH-08.

Groundwater samples were collected in general accordance with the CCR Ash Monofill Groundwater Detection Monitoring Plan (AECOM 2017). Each well was initially purged using a submersible bladder pump and dedicated polyethylene bonded tubing. Disposable bladder liners were replaced before sampling each monitoring well and the pump casing was decontaminated prior to purging and sampling each monitoring well to avoid cross contamination between wells. The bladder pump tubing was lowered into the well to a depth within the screen interval that was at least 1 to 2 feet off the bottom of the well to avoid disturbing accumulated sediment in the lower part of the well screen. Monitoring wells were purged using low flow sampling techniques until field parameter measurements of pH, temperature, dissolved oxygen, oxidation reduction potential, turbidity, and conductivity stabilized within plus or minus (±)10 percent and water level drawdown was observed to be less than 0.33 feet between measurement readings. Purge water volumes were recorded on groundwater sampling forms (**Appendix A**).

Groundwater samples were collected after purging each monitoring well. The samples were collected from the discharge tube of the bladder pump directly into laboratory-supplied sample containers. Sample water was slowly pumped into each laboratory sample container until the containers were appropriately filled, taking care not to spill the laboratory preservative contained in sample bottles. The sample containers were then labeled and placed on ice in a sample cooler. At the conclusion of the field day, the samples

were shipped by overnight carrier to Pace Analytical in Lenexa, Kansas and Greensburg, Pennsylvania, for analysis.

3.3 Analytical Program

Groundwater samples collected from the Ash Monofill wells were analyzed using U.S. Environmental Protection Agency SW-846 methods for Appendix III and Appendix IV constituents. All analytical results are reported as totals (unfiltered). **Table 3** (January)**, Table 4** (April)**, Table 5** (July), and **Table 6** (October) summarize the groundwater analytical results for each sampling event. The laboratory analytical reports are provided in **Appendix B**.

Appendix III constituents included: boron (Method 6010C), chloride (Method 9056A), calcium (Method 6010C), fluoride (Method 9056A), pH (field), sulfate (Method 9056A), and total dissolved solids (TDS) (American Public Health Association et al. [1998] Standard Method 2540C). The analytical method used for each constituent is shown in parenthesis following the analyte name.

Appendix IV constituents included: antimony (Method 6020A), arsenic (Method 6020A), barium (Method 6020A), beryllium (Method 6020A), cadmium (Method 6020A), chromium (Method 6020A), cobalt (Method 6020A), fluoride (Method 9056A), lead (Method 6020A), lithium (Method 6010C), mercury (Method 7470A), molybdenum (Method 6020A), radium 226/228 combined (Method 9315), selenium (Method 6020A), and thallium (Method 6020A).

3.4 Quality Control/Quality Assurance

Quality assurance and quality control samples collected during sampling activities included one field duplicate for each round of detection and assessment monitoring, one equipment rinse blank, and one matrix spike/matrix spike duplicate sample. The field duplicate samples were collected immediately following collection of the primary samples using the same sampling procedures. The equipment rinse blank samples were collected after decontaminating the bladder pump casing using techniques outlined in the sampling and analysis plan.

3.5 Data Validation

The laboratory data were validated by AECOM chemists using U.S. Environmental Protection Agency guidance. Data validation reports are provided in **Appendix B**.

4.0 Monitoring Results and Evaluation

This section discusses potentiometric surface elevations, groundwater flow directions, and analytical sampling results for the samples collected during the two assessment monitoring events conducted in April and October 2020 and the two-baseline detection and assessment monitoring events conducted in January and July 2020 at the Ash Monofill.

4.1 Groundwater Potentiometric Surface

As required by 40 CFR 257.93(c), the static depth to groundwater was measured at each well during each sampling round prior to purging. The depth to groundwater measurements (**Table 2**) were used with the top of casing elevations (**Table 1**) to calculate the groundwater elevations and prepare potentiometric surface maps for May, July, and October sampling events (**Figure 2**, **Figure 3**, and **Figure 4**). These maps were used to determine that groundwater in the uppermost aquifer beneath the Ash Monofill flows from northwest to southeast at an average hydraulic gradient of 0.0149 feet per foot (ft/ft) between monitoring wells ASH-01 and ASH-08 in 2020. This is very similar to the gradient calculated in 2019 of 0.14 ft/ft and is consistent with the average gradients previously reported in past annual reports (AECOM 2018 and 2019).

4.2 Groundwater Flow

An average flow rate was calculated for groundwater in the uppermost aquifer beneath the Ash Monofill using the historic average hydraulic gradient (0.016 ft/ft) determined between monitoring wells ASH-01 and ASH-06, the minimum and maximum hydraulic conductivities determined from aquifer slug tests, and an assumed effective porosity of 15 percent. The results indicate that groundwater in the uppermost aquifer beneath the Ash Monofill flows at a rate ranging from approximately 0.051 to 0.131 foot per day (ft/day), with a geometric mean of 0.073 ft/day.

4.3 Groundwater Analytical Results

Groundwater samples were collected and analyzed for Appendix III and IV parameters specified in Section 3.3 in January, April, July, and October 2020. The samples were analyzed by Pace Analytical in Lenexa, Kansas. The laboratory analytical reports are provided in **Appendix B** and included in the facility operating record. The laboratory results were reviewed for completeness against the project-required analytical methods and the chain-of-custody forms and subsequently validated by AECOM. The data were found to be valid and useable with qualification as outlined in the data verification reports found in **Appendix B**. **Table 3** (January)**, Table 4** (April)**, Table 5** (July), and **Table 6** (October) summarize the groundwater analytical results for each sampling round. Monitoring wells ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-06, ASH-07, and ASH-08 were sampled during the April and October events to comply with assessment monitoring requirements. Monitoring wells ASH-02, ASH-06, ASH-07, and ASH-08 also were sampled during the January and July 2020 events to collect quarterly baseline detection monitoring data.

4.4 Groundwater Monitoring System Evaluation

All monitoring wells comprising the Ash Monofill groundwater monitoring system were inspected during each sampling round and were found to be in good condition and capable of supplying a representative sample. However, several of the wells within the ash groundwater monitoring network have had increased turbidity due to the fine-grained composition of the Pierre Shale and may require further well development into the future.

Analysis of potentiometric surface maps constructed using the depth to groundwater measurements obtained during each sampling round (**Figure 2**, **Figure 3**, **Figure 4**, and **Figure 5**) indicate that groundwater beneath the Ash Monofill generally flows from northwest to southeast at average gradient in 2020 of 0.0149 ft/ft and a historic mean groundwater flow rate of approximately 0.073 ft/day. This flow

direction is consistent with the groundwater flow directions observed between 2016 and 2020. These data confirm that monitoring wells ASH-01 and ASH-06 are located upgradient of the Ash Monofill and represent background groundwater quality and that monitoring wells ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 are located downgradient of the Ash Monofill and represent downgradient groundwater quality.

4.5 Problems Encountered and Actions Taken

There were no problems encountered or actions taken during 2020.

5.0 Statistical Analysis Results

The Ash Monofill groundwater quality data were evaluated using the certified statistical approach presented in the CCR Ash Monofill Groundwater Detection Monitoring Plan (AECOM 2017). Groundwater quality data were evaluated using an interwell approach that statistically compared constituent concentrations at downgradient monitoring wells to those present at background monitoring wells. For the PRPA Ash Landfill, monitoring wells ASH-01 and ASH-06 are designated as the background wells because they are located upgradient of the northern landfill boundary, whereas monitoring wells ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 are designated as compliance wells because they are located downgradient of the southern monofill boundary.

The statistical analyses were performed in accordance with 40 CFR Parts 257.93(f), 257.93(g), and 257.93(h) and the Statistical Method Certification (AECOM 2017). Prediction limits (i.e., parametric or nonparametric) with 1 of 2 retesting were developed for each constituent based on the frequency of non-detect values and whether the background data for that constituent exhibited a normal, lognormal, or nonparametric distribution. For the statistical analysis, non-detect values were represented as one-half the detection limit. No outliers were identified in the data. Analytical data from the background monitoring wells collected between March 2016 and October 2019 were used to develop an upper prediction limit (UPL) for the background data at 95 percent confidence. Data from the downgradient monitoring wells for the same time period were compared to the UPL to identify SSIs over background. ProUCL Version 5.1 was used to store the data and run the statistical analyses. The results of the statistical analyses, including the Appendix III and IV UPLs, are provided in **Table 7** and **Table 8**, respectively. The statistical analysis output is provided in **Appendix C**.

5.1 Appendix III SSI Determination

The Appendix III detection monitoring results were compared against their respective background UPLs to determine if they exhibited SSIs above background. This comparison indicates that some of the boron, calcium, chloride, sulfate, and TDS concentrations at monitoring wells ASH-01, ASH-02, ASH-03, ASH-04, ASH-05, ASH-07, and ASH-08 have confirmed SSIs above the background UPLs as shown in the table below. Fluoride and pH did not show any SSIs above background at any of the downgradient compliance wells. The Appendix III SSIs found during 2020 are consistent with those identified during 2019.

Well	Boron	Calcium	Chloride	Fluoride	pH	Sulfate	TDS
ASH-02	SSI	-----	-----	-----	-----	-----	-----
ASH-02	SSI	-----	-----	-----	-----	-----	SSI
ASH-03	SSI	SSI	SSI	-----	-----	SSI	SSI
ASH-04	SSI	SSI	SSI	-----	-----	SSI	SSI
ASH-05	SSI	SSI	SSI	-----	-----	SSI	SSI
ASH-07	SSI	SSI	SSI	-----	-----	SSI	SSI
ASH-08	SSI	SSI	-----	-----	-----	SSI	SSI

Notes:

SSI = statistically significant increase

TDS = total dissolved solids

5.2 Appendix IV SSI Determination

The Appendix IV assessment monitoring results were compared against their respective background UPLs to determine if they exhibited SSIs above background. This comparison indicates that selenium at monitoring wells ASH-03, ASH-04, ASH-05, and ASH-07 and lithium at ASH-07 exhibit SSIs over the background UPL (**Table 9**). No other Appendix IV constituents exhibited verified SSIs over background.

5.3 Establishment of Groundwater Protection Standards

GWPS were selected for the Ash Monofill Appendix IV constituents using the criteria specified in 40 CFR 257.95(h). The GWPS listed on **Table 8** were selected from the U.S. Environmental Protection Agency drinking water maximum contaminant limits, groundwater standards provided in 40 CFR 257.95(3)(h)(2), or the background UPLs where they exceed either of the other standards.

5.4 Appendix IV SSL Determination

Constituents exhibiting an SSI over the background UPL were further evaluated to determine whether they are present at SSLs relative to GWPS established under the CCR Rule (40 CFR 257.95(d)(2)). SSLs were identified by calculating the 95 percent lower confidence limit (95 LCL) at each well where the assessment monitoring constituents exhibited an SSI over background and comparing the 95 LCL to the GWPS. A constituent is present at an SSL over the GWPS if the 95 LCL is greater than the GWPS. Selenium concentrations at monitoring wells ASH-03, ASH-05, and ASH-07 were found at an SSL above the GWPS because their 95 LCLs were greater than the selenium GWPS (0.05 milligram per liter [mg/L]) as shown in the table below. The 95 LCL for lithium at monitoring well ASH-07 did not exceed its GWPS at an SSL. Appendix IV constituents that exceed the GWPS at an SSL require an alternate source demonstration or corrective action. Selenium is the only Appendix IV constituent requiring corrective action at this time.

Well No.	Parameter	95% LCL (mg/L)	GWPS (mg/L)
ASH-03	Selenium	0.0557	0.05
ASH-04	Selenium	0.0349	0.05
ASH-05	Selenium	0.0801	0.05
ASH-07	Selenium	0.0814	0.05
ASH-07	Lithium	0.517	0.570

Notes:

Constituent's 95 LCL exceeds the GWPS

GWPS = groundwater protection standard

LCL = lower confidence limit

mg/L = milligrams per liter

6.0 Projected Activities in 2021

The following activities are anticipated to be performed at the Ash Monofill during calendar year 2021:

- PRPA will continue groundwater monitoring at the Ash Monofill on a semiannual basis for the Appendix III detection monitoring constituents and Appendix IV assessment monitoring constituents that were detected as specified in 40 CFR 257.95(d)(1) or 40 CFR 257.95(f). The full list of Appendix IV constituents also will be sampled annually.
- Baseline data will continue to be collected at ASH-02 and ASH-08 wells for Appendix III and IV constituents for one additional sampling event in 2021 to complete the eight rounds of quarterly sampling required. The wells will then be incorporated into the routine detection or assessment monitoring programs as appropriate. Sampling and analysis will be performed in accordance with the Ash Monofill Groundwater Monitoring Plan (AECOM 2017). The new data will be incorporated into the statistical analyses as appropriate.
- High turbidities reported at some of the Ash Monofill monitoring wells has led to increased sample purge times to achieve an acceptable groundwater sample turbidity. To improve yield and reduce turbidity, wells with elevated turbidity values or excessive purge times will be re-developed using a surge block and bailer or a submersible electric pump. During well development, AECOM personnel will sample the development water for pH, temperature, specific conductance, turbidity, and other observations (i.e., color and clarity) after each well casing volume is removed. Each well will be developed to obtain water that is relatively clear (i.e., turbidity is less than 50 nephelometric turbidity units) and/or all field parameters stabilized (i.e., less than a 10 percent change between measurements). A well is considered developed when the field parameters have stabilized, when 10 well casing volumes have been removed, or when the well is pumped dry.
- An Assessment of Corrective Measure (ACM) was prepared in August 2019 to identify potential remedial alternatives for selenium in groundwater at the Ash Monofill. The ACM included a range of cleanup options that included monitored natural attenuation, groundwater pump and treat, and a permeable reactive barrier. The ACM options were presented at a public meeting in November 2019. In 2021, the corrective actions presented in ACM will be evaluated for a final remedy selection and implementation.

7.0 Summary and Findings

AECOM, on behalf of PRPA, oversaw groundwater sampling and analysis of detection (Appendix III) and assessment (Appendix IV) monitoring at the Ash Monofill. Monitoring data and analytical results collected as part of the detection and assessment monitoring programs were evaluated to determine potentiometric surface elevations, groundwater flow directions and rates, and whether any constituents are present at an SSI above background UPLs or exceeded GWPS at an SSL.

The existing Ash Monofill monitoring well network was not modified this year as no new monitoring wells were installed. Quarterly baseline sampling was conducted at monitoring wells ASH-06, ASH-07 (installed in 2018), and ASH-08 (installed in 2019). Additional baseline sampling will be conducted in 2021 until 8 quarterly rounds have been collected at these wells. These data will be incorporated into the monitoring program as collected.

Selenium concentrations in groundwater at monitoring wells ASH-03, ASH-04, ASH-05, and selenium and lithium at monitor well ASH-07 were found to have SSIs above background UPLs. Additional statistical analysis found that selenium exceeds the GWPS at a SSL at wells ASH-03, ASH-05, and ASH-07. Selenium at monitor well ASH-04 and lithium at monitor well ASH-07 did not exceed the GWPS at a SSL. These results require continued assessment monitoring and corrective action for selenium at the Ash Monofill. Lithium does not require corrective action at this time.

An ACM was prepared in August 2019 to identify potential remedial alternatives for selenium in groundwater at the Ash Monofill. The ACM included a range of cleanup options that included monitored natural attenuation, groundwater pump and treat, and a permeable reactive barrier. The ACM options were presented at a public meeting in November 2019. Assessment monitoring results indicate that selenium exceeds the GWPS at an SSL at monitoring wells ASH-03, ASH-05, and ASH-07 and will require corrective action. No other constituent requires corrective action at this time. In 2021, the corrective actions presented in ACM will be evaluated for a final remedy selection and implementation.

8.0 References

AECOM Technical Services, Inc. (AECOM). 2017. Coal Combustion Residuals (CCR) Ash Monofill Groundwater Detection Monitoring Plan Revision 0. Prepared for Platte River Power Authority Rawhide Energy Station Larimer County, Colorado. October 10, 2017.

AECOM Technical Services, Inc. (AECOM). 2018. Bottom Ash Transfer (BAT) Impoundments Annual Groundwater Monitoring and Corrective Action Report 2016 – 2017. Prepared for Platte River Power Authority. January 31.

AECOM Technical Services, Inc. (AECOM). 2019. Bottom Ash Transfer (BAT) Impoundments Annual Groundwater Monitoring and Corrective Action Report For 2018. Prepared for Platte River Power Authority. January 31.

American Public Health Association, American Water Works Association, and Water Environment Federation. 1998. Standard Methods for the Examination of Water and Wastewater, 20th Edition.

Lidstone and Anderson, Inc. 1989. Investigation of the Ground-Water Monitoring Program for the Bottom Ash Disposal Site. March 1989.

Platte River Power Authority (PRPA). 1980. Engineering Report and Operational Plan for the Solid Waste Disposal Facility, Rawhide Energy Project, December 1980.

Title 40 of the Code of Federal Regulations (CFR) Part 257 Subpart D.

Tables

Table 1
Ash Monofill Monitoring Well Construction Details
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Well Name	Location Relative to Waste Unit	Easting (ft)	Northing (ft)	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Total Depth (ft bgs)	Well Screen Interval (ft bgs)	Well Screen Lithology
ASH-01	Upgradient Well	3124781.307	1562659.296	5759.29	5760.15	31	26-29	Shale
ASH-02	Downgradient Well	3127250.213	1558450.627	5679.25	5679.87	55	51-54	Shale
ASH-03	Downgradient Well	3126904.393	1558820.854	5714.21	5717.18	49	39-49	Shale
ASH-04	Downgradient Well	3126544.377	1558803.996	5689.58	5692.57	29	19-29	Shale
ASH-05	Downgradient Well	3126255.648	1558603.939	5696.68	5698.71	29	19-29	Shale
ASH-06	Upgradient Well	3126039.957	1562657.603	5783.23	5786.41	65	50-65	Shale
ASH-07	Downgradient Well	3127068.621	1558643.688	5687.58	5690.56	25	15-25	Shale
ASH-08	Downgradient Well	3126672.477	1558046.977	5681.22	5684.41	29	19-29	Shale

Notes:
ft amsl = feet above mean sea level; ft bgs = feet below ground surface
ASH-01 was installed in December 1980 as MW-1 by Black & Veatch.
ASH-02 was installed in December 1980 as MW-2 by Black & Veatch.
Wells surveyed in North American Datum 1983 (NAD83)

Table 2
Ash Monofill Groundwater Level Measurements 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Well ID	Sampling Event	Measurement Date	Measuring Point Elevation (ft amsl)	Depth To Water (ft btoc)	Measured Depth of Well (ft btoc)	Groundwater Elevation (ft amsl)
ASH-01	January 2020	1/9/2020	5760.15	13.34	NM	5746.81
ASH-01	February 2020	2/20/2020	5760.15	13.78	NM	5746.37
ASH-01	April 2020	4/14/2020	5760.15	13.11	NM	5747.04
ASH-01	July 2020	7/17/2020	5760.15	13.35	29.88	5746.79
ASH-01	October 2020	10/5/2020	5760.15	13.36	29.88	5746.79
ASH-02	January 2020	1/6/2020	5679.87	2.45	NM	5677.42
ASH-02	February 2020	2/20/2020	5679.87	2.17	NM	5677.70
ASH-02	April 2020	4/6/2020	5679.87	1.9	NM	5677.97
ASH-02	July 2020	7/13/2020	5679.87	2.93	53.7	5676.94
ASH-02	October 2020	10/5/2020	5679.87	4.42	53.7	5675.45
ASH-03	January 2020	1/6/2020	5717.18	37.18	NM	5680.00
ASH-03	February 2020	2/20/2020	5717.18	37.09	NM	5680.09
ASH-03	April 2020	4/6/2020	5717.18	36.61	NM	5680.57
ASH-03	July 2020	7/13/2020	5717.18	36.91	51.74	5680.27
ASH-03	October 2020	10/5/2020	5717.18	37.85	51.74	5679.33
ASH-04	January 2020	1/6/2020	5692.57	12.89	NM	5679.68
ASH-04	February 2020	2/20/2020	5692.57	12.77	NM	5679.80
ASH-04	April 2020	4/6/2020	5692.57	12.35	NM	5680.22
ASH-04	July 2020	7/13/2020	5692.57	12.37	32.34	5680.20
ASH-04	October 2020	10/5/2020	5692.57	12.97	32.34	5679.60
ASH-05	January 2020	1/6/2020	5698.71	20.94	NM	5677.77
ASH-05	February 2020	2/20/2020	5698.71	20.78	NM	5677.93
ASH-05	April 2020	4/6/2020	5698.71	20.41	NM	5678.30
ASH-05	July 2020	7/13/2020	5698.71	20.25	31.31	5678.46
ASH-05	October 2020	10/5/2020	5698.71	20.69	31.31	5678.02
ASH-06	January 2020	1/6/2020	5786.41	62.73	NM	5723.68
ASH-06	February 2020	2/20/2020	5786.41	63.19	NM	5723.22
ASH-06	April 2020	4/6/2020	5786.41	62.71	NM	5723.70
ASH-06	July 2020	7/13/2020	5786.41	62.75	70.09	5723.66
ASH-06	October 2020	10/5/2020	5786.41	62.79	70.09	5723.62
ASH-07	January 2020	1/6/2020	5690.56	13.92	NM	5676.64
ASH-07	February 2020	2/20/2020	5690.56	13.67	NM	5676.89
ASH-07	April 2020	4/6/2020	5690.56	13.11	NM	5677.45
ASH-07	July 2020	7/13/2020	5690.56	14.02	30.08	5676.54
ASH-07	October 2020	10/5/2020	5690.56	15.41	30.08	5675.15
ASH-08	January 2020	1/6/2020	5684.41	10.45	NM	5673.96
ASH-08	February 2020	2/20/2020	5684.41	10.07	NM	5674.34
ASH-08	April 2020	4/6/2020	5684.41	9.43	NM	5674.98
ASH-08	July 2020	7/13/2020	5684.41	9.95	29.92	5674.46
ASH-08	October 2020	10/5/2020	5684.41	11.06	29.92	5673.35

Notes:
ft = feet
ft amsl = feet above mean sea level
ft btoc = feet below top of casing
NM = not measured

Table 3
Ash Impoundments Analytical Results January 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-02	ASH-02	ASH-06	ASH-07	ASH-08
		Sample Type		Duplicate			
		Sample Date	01/15/2020	01/15/2020	01/15/2020	01/15/2020	01/15/2020
Chemical Name	**Analytical Method**	**Unit**					
Appendix III Parameters							
Boron	SW6010	µg/L	2010	2000	304	781	960
Calcium	SW6010	µg/L	169000	170000	24300	434000	447000
Chloride	EPA9056	mg/L	21.4	21.3	7.0	74.1	19.3
Fluoride	EPA9056	mg/L	< 0.20	< 0.20	0.72	< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2420	2440	68.3	3990	2800
Total Dissolved Solids	SM2540C	mg/L	4320	3490	500	6620	4560
Appendix IV Parameters							
Antimony	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	SW6020	µg/L	< 1.0	< 1.0	1.2	< 1.0	1.0
Barium	SW6020	µg/L	19.8	20.5	61.6	19.1	19.7
Beryllium	SW6020	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	SW6020	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium	SW6020	µg/L	< 1.0	< 1.0	2.3	< 1.0	1.8 J-
Cobalt	SW6020	µg/L	< 1.0	< 1.0	< 1.0	1.3	< 1.0
Lead	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lithium	SW6010	µg/L	290	294	56.3	537	297
Mercury	EPA7470	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	µg/L	8.2	8.2	17.3	1.0	1.9
Radium, total	TRC	pCi/L	0.652 J+	0.740 J+	0.812 J+	0.311 J+	0.487 J+
Radium-226	E903.1	pCi/L	-0.175	0.194 J+	0.122 J+	0.175 J+	0.0379 J+
Radium-228	E904.0	pCi/L	0.652 J+	0.546 J+	0.690 J+	0.136 J+	0.449 J+
Selenium	SW6020	µg/L	< 1.0	< 1.0	23.5	51.0	< 1.0
Thallium	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Field Parameters							
Dissolved Oxygen	Field Measure	mg/L	3.38	3.38	4.35	1.16	2.67
Oxidation Reduction Potential	Field Measure	mv	23.23	23.23	12.8	15.3	21.8
pH	Field Measure	SU	7	7	7.47	6.67	6.69
Specific Conductivity	Field Measure	µS/cm	3670	3670	6.67	5349	3964
Temperature	Field Measure	degC	10.34	10.34	10.78	11.74	9.88
Turbidity	Field Measure	NTU	2.44	2.44	3.62	16.2	5.28

Notes:

mg/L = milligram per liter
µg/L = microgram per liter
mv =millivolts
pCi/L = picocuries per liter
SU = standard units
< = not detected above indicated reporting limit
degC = degrees Centigrade
µS/cm = microSiemens per centimeter
NTU = nephelometric turbidity units
J+ = estimated concentration, biased high

Table 4
Ash Impoundments Analytical Results April 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-01	ASH-02	ASH-02 Duplicate	ASH-03	ASH-04	ASH-05	ASH-06	ASH-07	ASH-08
		Sample Type									
		Sample Date	04/14/2020	04/14/2020	04/14/2020	04/20/2020	04/10/2020	04/13/2020	04/20/2020	04/10/2020	04/13/2020
Chemical Name	**Analytical Method**	**Unit**									
Appendix III Parameters											
Boron	SW6010	µg/L	486	1990	1980	807	639	817	308	760	956
Calcium	SW6010	µg/L	381000	173000	172000	467000	470000	517000	24100	449000	455000
Chloride	EPA9056	mg/L	23.1	20.4	21.2	76.8	197	241	7.0	146	21.2
Fluoride	EPA9056	mg/L	0.24	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	0.69	< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2000	2090	2150	3190	3330	2950	63.6	4000	3070
Total Dissolved Solids	SM2540C	mg/L	3250	3430	2910	5760	6100	4570	443	7160	3130
Appendix IV Parameters											
Antimony	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Arsenic	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Barium	SW6020	µg/L	9.6	23.9	22.0	8.8	11.4	16.9	58.8	14.8	15.7
Beryllium	SW6020	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cadmium	SW6020	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chromium	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.6 U	< 1.0	< 1.0
Cobalt	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	1.4
Lead	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Lithium	SW6010	µg/L	439	320	316	428	362	288	60.2	547	291
Mercury	EPA7470	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	µg/L	< 1.0	8.4	8.4	< 1.0	1.3	< 1.0	15.4	1.3	1.0
Radium, total	TRC	pCi/L	0.981	0.321	0.801	1.09	1.21	1.43	0.481	1.32	4.04
Radium-226	E903.1	pCi/L	0.238 J	-0.115	0.201	0.337	0.516	0.404	0.0661	0.166 J	0.351 J
Radium-228	E904.0	pCi/L	0.743	0.321	0.600	0.753	0.696	1.03	0.415	1.15	3.69
Selenium	SW6020	µg/L	< 1.0	< 1.0	< 1.0	121	109	62.5	24.5	147	< 1.0
Thallium	SW6020	µg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Field Parameters											
Dissolved Oxygen	Field Measure	mg/L	1.96	4.28	4.28	0.19	0.3	0.56	6.1	0.61	0.56
Oxidation Reduction Potential	Field Measure	mv	58.2	47.9	47.9	108.5	55.5	55.7	79.9	68.5	52.8
pH	Field Measure	SU	7.93	8.56	8.56	7.46	7.97	6.95	8.19	7.48	7.18
Specific Conductivity	Field Measure	µS/cm	3537	3930	3930	5154	5412	4959	609	6077	4495
Temperature	Field Measure	degC	10.66	10.61	10.61	12.5	12.28	10.68	12.81	12.6	9.11
Turbidity	Field Measure	NTU	1.27	2.6	2.6	3.43	9.35	4.84	5.79	6.36	2.67

Notes:

mg/L = milligram per liter
µg/L = microgram per liter
mv =millivolts
pCi/L = picocuries per liter
SU = standard units
< = not detected above indicated reporting limit
degC = degrees Centigrade
µS/cm = microSiemens per centimeter
NTU = nephelometric turbidity units
J = estimated concentration

Table 5
Ash Impoundments Analytical Results July 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-02	ASH-02	ASH-06	ASH-06	ASH-07	ASH-08
		Sample Type	N	FD	N	N	N	N
		Sample Date	07/16/2020	07/16/2020	07/22/2020	07/24/2020	07/16/2020	07/16/2020
Chemical Name	**Analytical Method**	**Unit**						
Appendix III Parameters								
Boron	SW6010	µg/L	2040	2040	--	334	742	942
Calcium	SW6010	µg/L	164000	165000	--	37600	431000	432000
Chloride	EPA9056	mg/L	21.0	20.6	7.9	--	180	20.5
Fluoride	EPA9056	mg/L	0.24	0.24	0.77	--	< 0.20	< 0.20
Sulfate	EPA9056	mg/L	2090	2080	101	--	4200	2880
Total Dissolved Solids	SM2540C	mg/L	3270	3110	472	--	6890	4520
Appendix IV Parameters								
Antimony	SW6020	µg/L	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0
Arsenic	SW6020	µg/L	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0
Barium	SW6020	µg/L	20.0	19.8	--	64.7	11.7	14.3
Beryllium	SW6020	µg/L	< 0.50	< 0.50	--	< 2.5	< 1.0	< 0.50
Cadmium	SW6020	µg/L	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50
Chromium	SW6020	µg/L	< 1.0	< 1.0	--	12.6	< 1.0	< 1.0
Cobalt	SW6020	µg/L	< 1.0	< 1.0	--	< 5.0	< 1.0	1.5
Lead	SW6020	µg/L	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0
Lithium	SW6010	µg/L	314	317	--	57.5	589	311
Mercury	EPA7470	µg/L	< 0.20	< 0.20	--	< 0.20	< 0.20	< 0.20
Molybdenum	SW6020	µg/L	8.2	8.1	--	22.4	1.6	1.0
Radium, total	TRC	pCi/L	0.850	1.80	--	0.998*	0.328	0.481
Radium-226	E903.1	pCi/L	0.0466	0.377 J	--	0.0586*	0.256	0.253
Radium-228	E904.0	pCi/L	0.803	1.42	--	0.939*	0.0718	0.228
Selenium	SW6020	µg/L	< 1.0	< 1.0	--	25.9	220	< 1.0
Thallium	SW6020	µg/L	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0
Field Parameters								
Dissolved Oxygen	Field Measure	mg/L	1.32	1.32	7.08	7.08	0.38	0.24
Oxidation Reduction Potential	Field Measure	mv	64.1	64.1	55.3	55.3	45.8	41.9
pH	Field Measure	SU	7.08	7.08	7.71	7.71	7	6.93
Specific Conductivity	Field Measure	µS/cm	4072	4072	681	681	6921	4442
Temperature	Field Measure	degC	15.06	15.06	15.84	15.84	14.95	15.4
Turbidity	Field Measure	NTU	3.38	3.38	3.87	3.87	3.8	2.64

Notes:

mg/L = milligram per liter
µg/L = microgram per liter
mv =millivolts
pCi/L = picocuries per liter
SU = standard units
< = not detected above indicated reporting limit
degC = degrees Centigrade
µS/cm = microSiemens per centimeter
NTU = nephelometric turbidity units
J = estimated concentration
* = data from July 2020 CDPHE sample

Table 6
Ash Impoundments Analytical Results October 2020
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

		Sample Location	ASH-01	ASH-02	ASH-02 Duplicate	ASH-03	ASH-04	ASH-05	ASH-06	ASH-06	ASH-07	ASH-08
		Sample Type										
		Sample Date	10/05/2020	10/09/2020	10/09/2020	10/15/2020	10/15/2020	10/09/2020	10/16/2020	10/20/2020	10/15/2020	10/08/2020
Chemical Name	**Analytical Method**	**Unit**										
Appendix III Parameters												
Boron	SW6010	µg/L	487	2140	2100	782	640	884	312	--	766	1020
Calcium	SW6010	µg/L	329000	176000	172000	445000	446000	557000	24500	--	413000	425000
Chloride	EPA9056	mg/L	23.0	20.4	21.4	90.5	211	242	7.7	--	197	21.0
Fluoride	EPA9056	mg/L	0.24	0.23	0.23	< 0.20	0.29	< 0.20	0.84	--	R	0.22 J-
Sulfate	EPA9056	mg/L	2100	1050	1090	3290	3340	2710	82.8	--	4390	2610
Total Dissolved Solids	SM2540C	mg/L	3330	3350	3270	5400	5840	4810	417	--	8140	4830
Appendix IV Parameters												
Antimony	SW6020	µg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	< 3.0
Arsenic	SW6020	µg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	< 3.0
Barium	SW6020	µg/L	9.3	19.0	17.2	8.6	13.5	15.4	47.7	--	13.0	16.6
Beryllium	SW6020	µg/L	< 0.50	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	--	< 1.5	< 0.50
Cadmium	SW6020	µg/L	< 0.50	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	--	< 1.5	< 0.50
Chromium	SW6020	µg/L	< 1.0	< 3.0	< 3.0	8.4	< 3.0	< 3.0	5.1	--	< 3.0 UJ-	< 3.0
Cobalt	SW6020	µg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	1.7
Lead	SW6020	µg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	< 1.0 UJ-
Lithium	SW6010	µg/L	413	303	302	374	341	313	51.6	--	494	339
Mercury	EPA7470	µg/L	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--	< 0.20	< 0.20
Molybdenum	SW6020	µg/L	< 1.0	8.5	8.4	< 3.0	< 3.0	< 3.0	17.7	--	< 3.0	1.5
Radium, total	TRC	pCi/L	1.32	0.355	0.339	0.911	1.83 J+	1.31	--	1.11	0.470	1.98 J+
Radium-226	E903.1	pCi/L	0.202	-0.0655	0	0.622	0.309 J	0.687	--	0.213	0.261 J	0.615
Radium-228	E904.0	pCi/L	1.12 J+	0.355	0.339	0.289	1.52 J+	0.619	--	0.899	0.209	1.36 J+
Selenium	SW6020	µg/L	< 1.0	< 3.0	< 3.0	114	95.5	57.8	27.6	--	183	< 3.0
Thallium	SW6020	µg/L	< 1.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0	--	< 3.0	< 1.0
Field Parameters												
Dissolved Oxygen	Field Measure	mg/L	1.65	1.21	1.21	1.74	0.32	0.53	8.71	--	1.13	0.64
Oxidation Reduction Potential	Field Measure	mv	29.7	38.6	38.6	-16.5	-7.4	13.1	19.1	--	-11.4	1.2
pH	Field Measure	SU	7.31	7.45	7.45	7.08	7.09	7.11	7.22	--	7.12	7.01
Specific Conductivity	Field Measure	µS/cm	3754	4236	4236	4977	5292	5128	655	--	6580	4534
Temperature	Field Measure	degC	12.35	12.89	12.89	10.99	12.98	13.69	12.75	--	12.6	16.4
Turbidity	Field Measure	NTU	4.11	3.41	3.41	3.01	7.36	6.98	2.84	--	3.06	2.5

Notes:

mg/L = milligram per liter
µg/L = microgram per liter
mv =millivolts
pCi/L = picocuries per liter
SU = standard units
< = not detected above indicated reporting limit
degC = degrees Centigrade
µS/cm = microSiemens per centimeter
NTU = nephelometric turbidity units
J = estimated concentration
UJ- = non detect, estimated biased low
UJ+ = non detect, estimated biased high
J+ = estimated concentration, biased high
R = rejected data, not usable

Table 7
Ash Monofill Appendix III Background Upper Prediction Limits
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background UPL
Boron (mg/L)	17	0	Yes/No	Parametric	0.63
Calcium (mg/L)	17	0	No/No	Nonparametric	380
Chloride (mg/L)	15	0	No/No	Nonparametric	29
Fluoride (mg/L)	17	29	Yes/Yes	Parametric	1.17
pH (standard units)	15	0	No/Yes	Parametric	9.28
Sulfate (mg/L)	15	7	No/No	Nonparametric	2,740
Total Dissolved Solids (mg/L)	17	0	No/No	Nonparametric	3,900

Notes:

mg/L = milligrams per liter

UPL = upper prediction limit

Table 8
Ash Monofill Appendix IV Background Upper Prediction Limits
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

Parameter (Units)	Number of Samples	Percent Nondetects	Normal or Lognormal Distribution?	Statistical Test	Background Limit	GWPS
Antimony (mg/L)	17	100	No/No	MDL	0.004	0.006
Arsenic (mg/L)	17	82	No/No	MDL	0.004	0.05
Barium (mg/L)	17	0	No/No	Nonparametric	0.072	2.0
Beryllium (mg/L)	17	100	No/No	MDL	0.002	0.004
Cadmium (mg/L)	17	100	No/No	MDL	0.002	0.005
Chromium (mg/L)	17	100	No/No	MDL	0.004	0.1
Cobalt (mg/L)	17	76	No/No	Nonparametric	0.042	0.042
Fluoride (mg/L)	17	29	Yes/Yes	Parametric	1.17	4.0
Lead (mg/L)	17	88	No/No	MDL	0.004	0.015
Lithium (mg/L)	17	0	No/No	Nonparametric	0.57	0.57
Mercury (mg/L)	17	100	No/No	MDL	0.0002	0.002
Molybdenum (mg/L)	17	71	No/No	Nonparametric	0.056	0.1
Selenium (mg/L)	17	35	No/No	Nonparametric	0.034	0.05
Thallium (mg/L)	17	100	No/No	MDL	0.004	0.004
Radium-226+228 Combined (pCi//L)	15	20	Yes/Yes	Parametric	2.63	5

Notes:
GWPS = groundwater protection standard
mg/L = milligrams per liter
pCi/L = picoCuries per liter
MDL = background limit set at maximum detection or reporting limit

All of the antimony, beryllium, cadmium, chromium, cobalt, mercury, molybdenum, and thallium results in the background monitoring wells were reported as not detected or detected less than 5 percent. For these constituents, the maximum detection or reporting limit was selected as the UPL per the double quantification rule in the U.S. Environmental Protection Agency's Unified Statistical Guidance (2009).

Table 9
Ash Monofill Appendix IV Statistical Results
PRPA Ash Monofill Annual Report for 2020
PRPA Rawhide Facility, Colorado

			Well Number	ASH-01	ASH-01	ASH-02	ASH-02	ASH-02	ASH-02	ASH-02	ASH-02	ASH-02	ASH-02	ASH-03	ASH-03	ASH-04	ASH-04	ASH-05	ASH-05	ASH-06	ASH-06	ASH-06	ASH-06	ASH-06	ASH-07	ASH-07	ASH-07	ASH-07	ASH-08	ASH-08	ASH-08	ASH-08
			Sample Date	04/14/2020	10/05/2020	01/15/2020	01/15/2020	04/14/2020	04/14/2020	07/16/2020	07/16/2020	10/09/2020	10/09/2020	04/20/2020	10/15/2020	04/10/2020	10/15/2020	04/13/2020	10/09/2020	01/15/2020	04/20/2020	07/22/2020	07/24/2020	10/16/2020	10/20/2020	01/15/2020	04/10/2020	07/16/2020	10/15/2020	01/15/2020	04/13/2020	07/16/2020	10/08/2020
			Sample Type	N	N	N	FD	N	FD	N	N	N	FD	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Parameter	**Unit**	**Background UPL**	**GWPS**																													
Antimony	mg/L	0.004	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001	--	< 0.005	< 0.003	--	< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.003
Arsenic	mg/L	0.004	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 1.0	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	**0.0012**	**0.0012**	--	< 0.005	< 0.003	--	< 0.001	< 0.001	< 0.001	< 0.003	**0.001**	< 0.001	< 0.001	< 0.003
Barium	mg/L	0.072	2.0	**0.0096**	**0.0093**	**0.0198**	**0.0205**	**0.0239**	**0.022**	**0.02**	**0.0198**	**0.019**	**0.0172**	**0.0088**	**0.0086**	**0.0114**	**0.0135**	**0.0169**	**0.0154**	**0.0616**	**0.0588**	--	**0.0647**	**0.0477**	--	**0.0191**	**0.0148**	**0.0117**	**0.013**	**0.0197**	**0.0157**	**0.0143**	**0.0166**
Beryllium	mg/L	0.002	0.004	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0005	--	< 0.0025	< 0.0015	--	< 0.0005	< 0.0005	< 0.001	< 0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	0.002	0.005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0015	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0015	< 0.0005	< 0.0005	--	< 0.0025	< 0.0015	--	< 0.0005	< 0.0005	< 0.0006	< 0.0015	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Chromium	mg/L	0.004	0.10	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	**0.0084**	< 0.001	< 0.003	< 0.001	< 0.003	**0.0023**	< 0.0026 U	--	**0.0126**	**0.0051**	--	< 0.001	< 0.001	< 0.001	< 0.003	0.0018 J-	< 0.001	< 0.001	< 0.003
Cobalt	mg/L	0.042	0.042	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001	--	< 0.005	< 0.003	--	**0.0013**	**0.0013**	< 0.001	< 0.003	< 0.001	**0.0014**	**0.0015**	**0.0017**
Fluoride	mg/L	1.17	4.0	**0.24**	**0.24**	< 0.20	< 0.20	< 0.20	< 0.20	**0.24**	**0.24**	**0.23**	**0.23**	< 0.20	< 0.20	< 0.20	**0.29**	< 0.20	< 0.20	**0.72**	**0.69**	**0.77**	--	**0.84**	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	**0.22**
Lead	mg/L	0.004	0.015	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001	--	< 0.005	< 0.003	--	< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Lithium	mg/L	0.57	0.57	**0.439**	**0.413**	**0.29**	**0.294**	**0.32**	**0.316**	**0.314**	**0.317**	**0.303**	**0.302**	**0.428**	**0.374**	**0.362**	**0.341**	**0.288**	**0.313**	**0.0563**	**0.0602**	--	**0.0575**	**0.0516**	--	**0.537**	**0.547**	**0.589**	**0.494**	**0.297**	**0.291**	**0.311**	**0.339**
Mercury	mg/L	0.0002	0.002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	--	< 0.0002	< 0.0002	--	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.056	0.10	< 0.001	< 0.001	**0.0082**	**0.0082**	**0.0084**	**0.0084**	**0.0082**	**0.0081**	**0.0085**	**0.0084**	< 0.001	< 0.003	**0.0013**	< 0.003	< 0.001	< 0.003	**0.0173**	**0.0154**	--	**0.0224**	**0.0177**	--	**0.001**	**0.0013**	**0.0016**	< 0.003	**0.0019**	**0.001**	**0.001**	**0.0015**
Selenium	mg/L	0.034	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	**0.121**	**0.114**	**0.109**	**0.0955**	**0.0625**	**0.0578**	**0.0235**	**0.0245**	--	**0.0259**	**0.0276**	--	**0.051**	**0.147**	**0.22**	**0.183**	< 0.001	< 0.001	< 0.001	< 0.003
Thallium	mg/L	0.004	0.004	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.003	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.003	< 0.001	< 0.001	--	< 0.005	< 0.003	--	< 0.001	< 0.001	< 0.001	< 0.003	< 0.001	< 0.001	< 0.001	< 0.001
Radium, total	pCi/L	2.63	5.0	**0.981**	**1.32**	**0.652 J+**	**0.740 J+**	**0.321**	**0.801**	**0.85**	**1.8**	**0.355**	**0.339**	**1.09**	**0.911**	**1.21**	**1.83**	**1.43**	**1.31**	**0.812 J+**	**0.481**	--	--	--	**1.11**	**0.311 J+**	**1.32**	**0.328**	**0.47**	**0.487 J+**	**4.04**	**0.481**	**1.98**

Notes:
N = primary sample
FD = field duplicate
mg/L = milligrams per liter
pCi/L = picoCuries per liter
Bold **black** value is detected result
Bold **red** value exceeds groundwater protection standard (GWPS)
SSI = statistically significant increase over background upper prediction limit (UPL)
SSL = statistically significant level above the GWPS

Figures

Last saved: 1/12/2021
Path: C:\Users\vlad.moldovan\AECOM Directory\GDS GIS Services - DCS AMERICAS\CENTRAL REGION US\PRPA\2021.01.12\02. Work\Figure 1 ASH.mxd

Project Management Initials: Design RLH Drawn AGS Checked JH Approved VK

ANSI B 11" x 17"

CCR 2020 Annual Groundwater Report
Platte River Power Authority Wellington, CO
Project No.: 60605002 Date: 2021-01-12

Rawhide Energy Station
ASH Monitoring Well Network

AECOM

Figure 1

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Path: C:\Users\vlad.moldovan\AECOM Directory\GDS GIS Services - DCS AMERICAS\CENTRAL REGION US\PRPA\2021.01.12\02. Work\Figure 2 ASH.mxd
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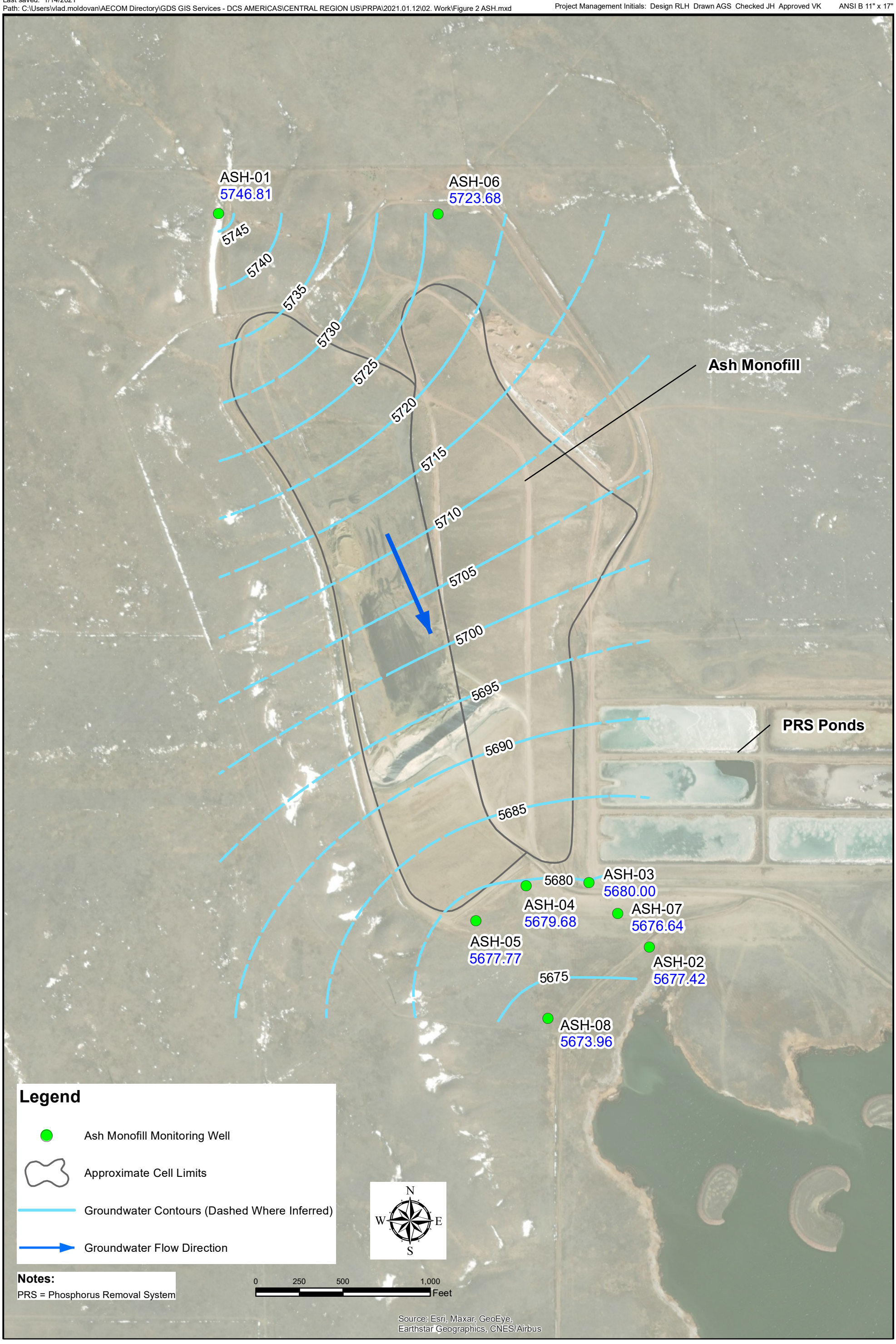

CCR 2020 Annual Groundwater Report
Platte River Power Authority Wellington, CO
Project No.: 60605002 Date: 2021-01-14

Rawhide Energy Station
ASH Monitoring Well Networks
January 2020 Water Levels

AECOM

Figure 2

Last saved: 1/12/2021
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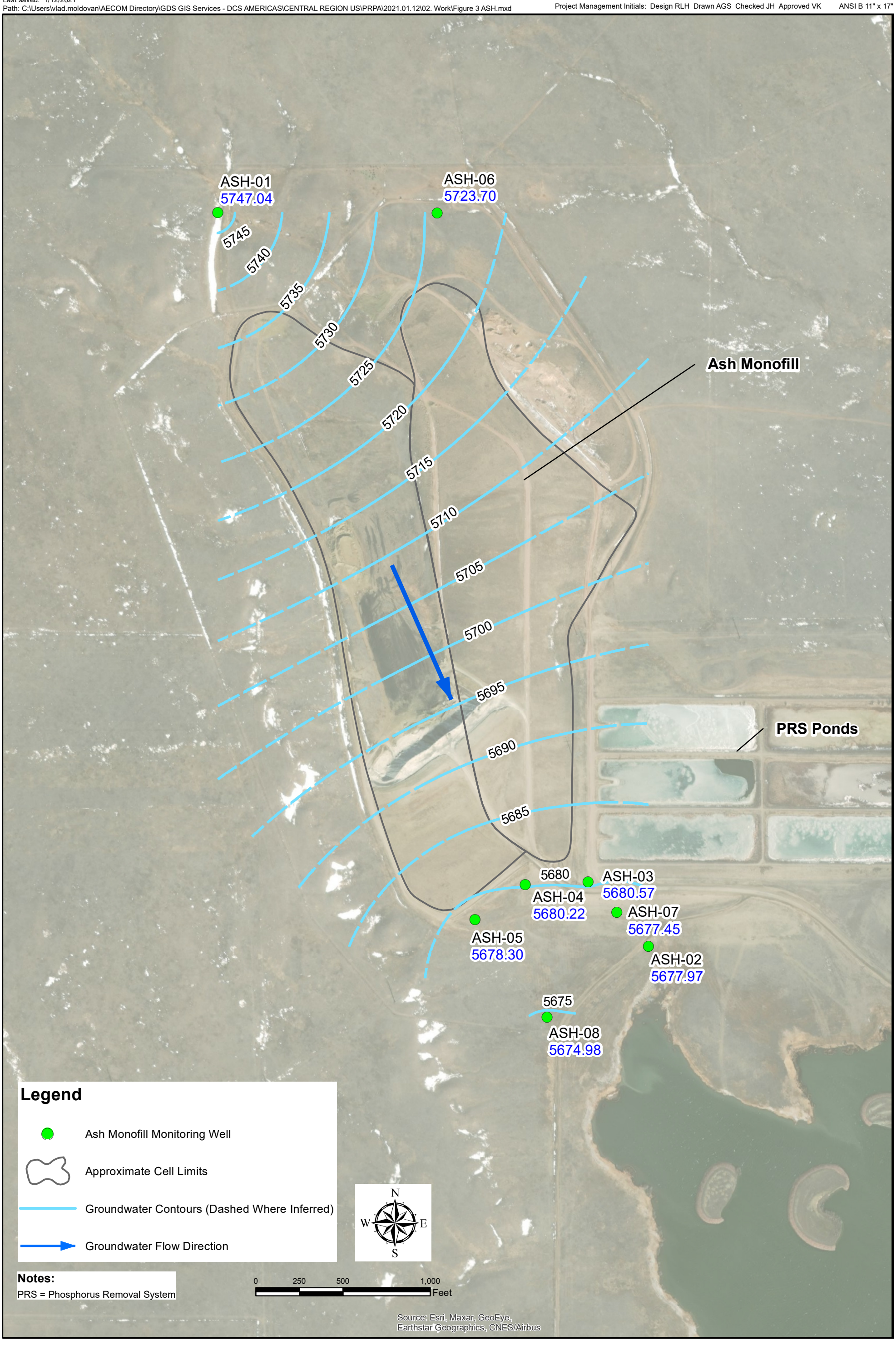

CCR 2020 Annual Groundwater Report
Platte River Power Authority Wellington, CO
Project No.: 60605002 Date: 2021-01-12

Rawhide Energy Station
ASH Monitoring Well Networks
April 2020 Water Levels

AECOM

Figure 3

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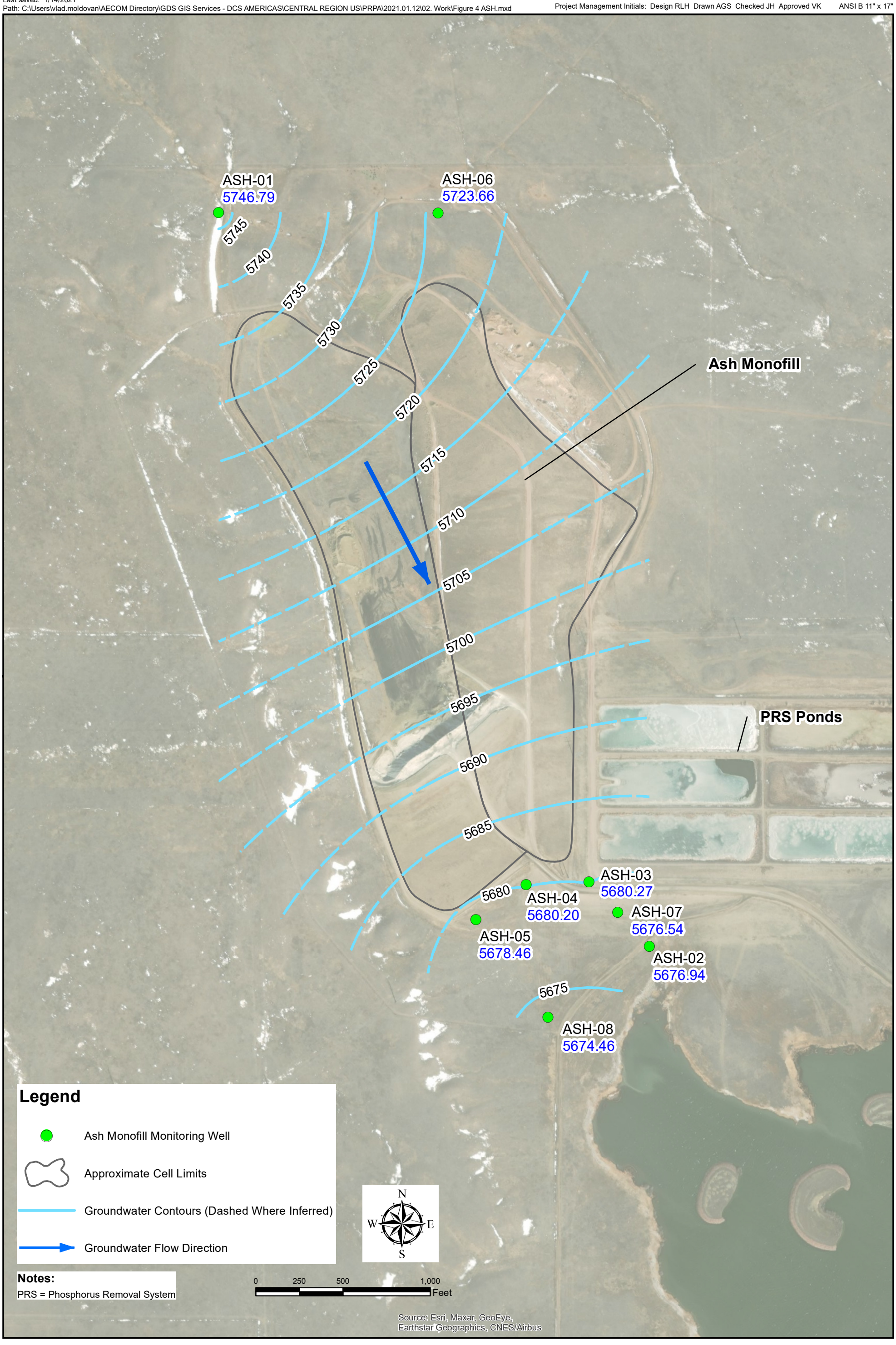
Project Management Initials: Design RLH Drawn AGS Checked JH Approved VK ANSI B 11" x 17"



CCR 2020 Annual Groundwater Report
Platte River Power Authority Wellington, CO
Project No.: 60605002 Date: 2021-01-14

Rawhide Energy Station
ASH Monitoring Well Networks
July 2020 Water Levels

AECOM

Figure 4

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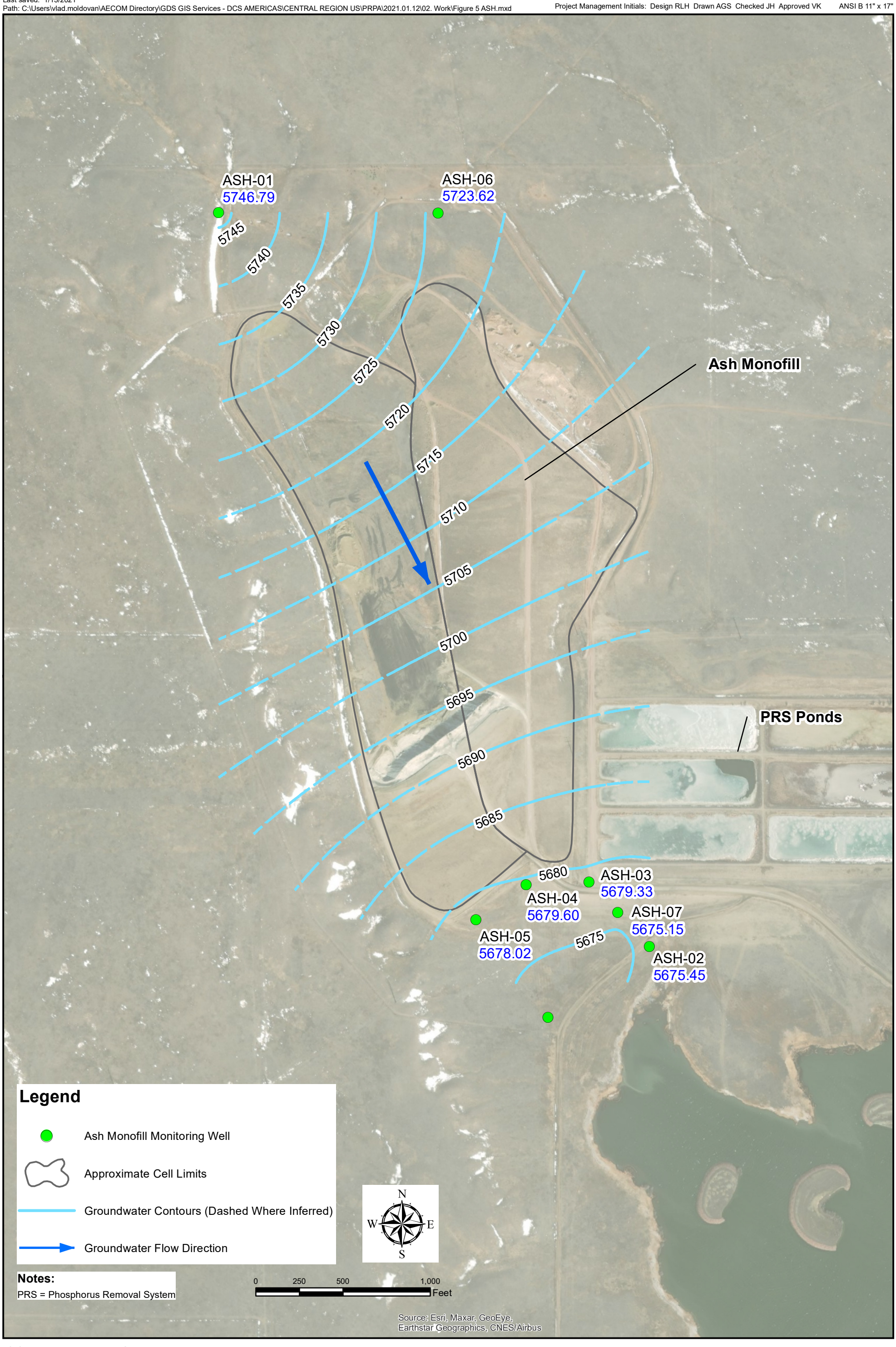
Project Management Initials: Design RLH Drawn AGS Checked JH Approved VK

ANSI B 11" x 17"



CCR 2020 Annual Groundwater Report
Platte River Power Authority Wellington, CO
Project No.: 60605002 Date: 2021-01-13

Rawhide Energy Station
ASH Monitoring Well Networks
October 2020 Water Levels

AECOM

Figure 5

Appendix A

Groundwater Sampling Forms

AECOM

Well/Piezo ID: MW-2(ASH-02)

Ground Water Sample Collection Record

Client: Platte River Power Authority - Rawhide Energy Station
Project No: 60605002
Site Location: Wellington, CO
Weather Conds: 30° Sunny Windy
Collector(s): W Weichert & C Ahrendt
Date: 1-15-20
Time: Start 8:20
Finish 9:55

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length —
b. Water Table Depth 2.38
c. Casing Material PVC
d. Casing Diameter 4"
e. Length of Water Column — (a-b)
f. Calculated Well Volume (see back) —

WELL PURGING DATA

a. Purge Method Low Flow

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ NA well volumes) Low Flow
- Maximum Allowable Turbidity 20-30 NTUs
- Stabilization of parameters 10 %

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	
Hach	2100 Q	

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time / Stabilization	Volume Removed (gal) --	T° (C) +/- 10%	pH +/- 10%	Spec. Cond (µs/cm) +/- 10%	ORP +/- 10%	DO mg/L +/- 10%	Turbidity (NTU) 5.00	Color	DTW Other	
832	0	8.86	6.47	3652	50.3	23.78	4.70	Clear	2.78	
835	1.5L	9.89	6.69	3647	36.3	6.76	4.56	Clear	3.08	
838	2.5L	10.16	6.82	3658	29.1	4.43	3.47	clear	3.42	Turbidity 4.94
841	3.5L	10.29	6.90	3659	26.8	3.83	5.35	Clear	3.75	
844	4.5L	10.31	6.95	3668	23.5	3.55	2.63	clear	4.27	
847	5.5	10.34	7.00	3670	23.2	3.38	2.44	Clear	4.63	
					23.2					

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☒
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Submersible Bladder Pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
MW-2(ASH-02)-CDPHE	See COC	16	See COC	CDPHE	900
ASH-02(MW-2)-CCR	See COC	5	See COC	CCR	9:00
DUP-2-CCR	See COC	5	See COC	CCR	—

Comments: Collect Duplicate Sample for CCR Program Labeled "DUP-2-CCR"

Signature: W Weichert Date: 1-15-20

AECOM

Well/Piezo ID: ASH-06

Ground Water Sample Collection Record

Client: Platte River Power Authority - Rawhide Energy Station
Project No: 60605002
Site Location: Wellington, CO
Weather Conds: 40°F Sunny
Collector(s): W Weichert & C Ahrendt
Date: 1-15-20
Time: Start 13:15
Finish 15:15

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length —
b. Water Table Depth 62.82
c. Casing Material PVC
d. Casing Diameter 2"
e. Length of Water Column — (a-b)
f. Calculated Well Volume (see back) —

WELL PURGING DATA

a. Purge Method Low Flow

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ NA well volumes) Low Flow
- Maximum Allowable Turbidity 20-30 NTUs
- Stabilization of parameters 10 %

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	
Hach	2100 Q	

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW ~~Other~~
Stabilization	--	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	5.00		
13:28	0	9.73	7.45	781	23.5	11.90	5.79	clear	62.93
13:31	0.5	10.45	7.42	746	20.0	10.52	4.55	clear	63.10
13.34	1.0	10.80	7.47	700	15.3	4.28	3.26	clear	63.30
13.37	1.8	10.78	7.47	667	12.8	4.35	3.62	clear	63.51

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☒
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☐	☒	☐

If no or N/A - Explain below.
Sample because of draw down

SAMPLE COLLECTION: Method: Bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-06-COPHE	See COC	16	See COC	COPHE	14:00
ASH-06-CCR	See COC	5	See COC	CCR	14:00

Comments

Signature Wm Weichert Date 1-15-20

AECOM

Well/Piezo ID: ASH-07

Ground Water Sample Collection Record

Client: Platte River Power Authority - Rawhide Energy Station
Project No: 60605002
Site Location: Wellington, CO
Weather Conds: 38°F Sunny
Collector(s): W Weichert & C Ahrendt
Date: 1/15/20
Time: Start 12:00
Finish 13:10

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length: —
b. Water Table Depth: 14.03
c. Casing Material: PVC
d. Casing Diameter: 2"
e. Length of Water Column: — (a-b)
f. Calculated Well Volume (see back): —

WELL PURGING DATA

a. Purge Method: Low Flow

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ NA well volumes) Low Flow
- Maximum Allowable Turbidity 20-30 NTUs
- Stabilization of parameters 10 %

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	
Hach	2100Q	

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW ~~Other~~
Stabilization	--	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	5.00		
1206	0 L	11.47	7.04	5336	38.5	7.98	41.6	Clear	14.44
1209	1.5 L	11.66	6.81	5327	25.1	2.49	42.2	Clear	14.27
1212	2.0 L	11.90	6.74	5319	19.4	1.49	28.5	Clear	14.23
1215	2.2 L	11.34	6.69	5310	16.8	1.14	30.2	Clear	14.42
1218	3.0 L	11.66	6.68	5305	16.0	1.03	27.7	Clear	14.55
1221	4.0 L	11.74	6.67	5349	15.3	1.16	16.2	Clear	14.62

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☒
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-07-COPHE	See COC	16	See COC	COPHE	1230
ASH-07-CCR	See COC	5	See COC	CCR	1230

Comments

Signature: W Weichert Date: 1/15/20

AECOM

Well/Piezo ID: ASH-08

Ground Water Sample Collection Record

Client: Platte River Power Authority - Rawhide Energy Station
Project No: 60605002
Site Location: Wellington, CO
Weather Conds: 30° Sunny Windy
Collector(s): W Weichert & C Ahrendt
Date: 1-15-20
Time: Start 10:00
Finish 11:55

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length —
b. Water Table Depth 10.37
c. Casing Material PVC
d. Casing Diameter 2"
e. Length of Water Column — (a-b)
f. Calculated Well Volume (see back) —

WELL PURGING DATA

a. Purge Method Low Flow

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ NA well volumes) Low Flow
- Maximum Allowable Turbidity 20-30 NTUs
- Stabilization of parameters 10 %

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	
Hach	2100 Q	

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW ~~Other~~
Stabilization	--	+/- 10%	+/- 10%	+/- 10%	+/- 10%	+/- 10%	5.00		
1006	0	9.27	6.85	3974	45.2	9.51	10.2	clear	11.25
1009	1.5 L	10.11	6.66	3986	38.0	4.00	14.3	clear	12.75
1013	3.5 L	10.42	6.64	3976	26.0	1.67	11.1	clear	14.52
1016	4.2 L	10.36	6.68	3977	22.3	1.84	5.94	clear	15.05
1020	5.0 L	9.81	6.65	3971	21.9	2.14	5.36	clear	15.45
1023	5.5 L	9.94	6.69	3957	21.6	2.45	4.63	clear	15.67
1026	6.0 L	9.88	6.69	3964	21.8	2.67	5.20	clear	15.87

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: Bladder Pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-08-CDPHE	See COC	16	See COC	CDPHE	1045
ASH-08-CCR	See COC	13	See COC	~~ECR~~ CCR	1045

Comments: Collect 2nd MS/MSD for CCR Program

Signature: WM Wmt

Date: 1/15/20

AECOM

Well/Piezo ID: MW-1(ASH-01) EDPNE CCR

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Sun, 28°, breezy
Collector(s) J. Hurshman, C. Ahrendt
Date: 4/14/20
Time: Start 850
Finish

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 13.11
c. Casing Material PVC
d. Casing Diameter 4
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
920	minimal	9.58	6.71	3492	89.7	6.37	3.35	clear	13.20
935	0.3	10.05	7.71	3525	78.7	4.24	2.05	clear	13.40
940	0.5	10.35	7.44	3526	73.1	3.66	1.31	clear	13.46
945	0.9	10.51	7.38	3530	69.2	3.15	1.24	clear	13.50
950	1.2	10.40	7.66	3538	66.8	2.87	1.25	clear	13.52
955	1.5	10.52	7.74	3536	64.6	2.55	1.20	clear	13.52
1000	1.8	10.46	7.80	3537	62.6	2.45	1.24	clear	13.52
1005	2.0	10.53	7.85	3542	60.8	2.16	1.11	clear	13.52
1010	2.2	10.62	7.91	3541	59.5	1.95	1.35	clear	13.52
1015	2.4	10.66	7.93	3537	58.2	1.96	1.27	clear	13.52

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-01-CCR2	See COC		→	→	1020
ASH-01-CCPNE	"		→	→	

Comments: CCR (MS/MSD) Collected. 3x volume collected.

Signature _____ Date 4/14/2020

AECOM

Well/Piezo ID: ASH-02 CCR COPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: sun, windy, 45° Collector(s) J. Hurshman, C. Ahrendt
Date: 4/14/20
Time: Start 1245
Finish

WATER LEVEL DATA: (measured from Top of Casing) Well ☒ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 1.90 4/6/2020
c. Casing Material PVC
d. Casing Diameter 4"
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1308	initial	9.65	8.44	3914	49.0	6.57	3.80	clear	2.27
1313	0.3	10.43	8.52	3917	47.8	4.65	4.01	clear	2.70
1318	0.5	10.54	8.57	3928	47.5	4.42	2.79	clear	3.0
1323	0.7	10.61	8.56	3930	47.9	4.28	2.60	clear	3.4

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☒
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-02-CCR	see COC				1330
ASH-02-COPHE	see COC				1310

Comments: Dup-3-CCR Collected

Signature _____ Date 4/14/2020

AECOM

Well/Piezo ID: ASH-03 CCR CDPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Sun, breezy, Collector(s) J. Hurshman, C. Ahrendt
Date: 4/20/20
Time: Start 1240
Finish

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 36.61 4/6/20
c. Casing Material PVC
d. Casing Diameter 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1252	Initial	12.91	7.77	5113	93.3	1.91	4.94	clear	37.34
1255	0.2	12.84	7.64	5176	99.0	1.04	3.04	clear	37.60
1258	0.4	12.38	7.59	5148	102.4	0.66	3.91	clear	37.77
1302	0.6	12.44	7.51	5154	105.0	0.46	3.58	clear	37.87
1306	0.8	12.48	7.49	5151	106.6	0.36	3.22	clear	37.95
1309	1.0	12.45	7.51	5158	107.3	0.30	2.91	clear	37.95
1313	1.2	12.49	7.47	5149	108.0	0.24	2.83	clear	37.91
1316	1.4	12.48	7.48	5151	108.1	0.21	2.46	clear	38.03
1319	1.6	12.50	7.46	5154	108.5	0.19	3.43	clear	38.03

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-03-CCR	See COC				1325
ASH-03-CDPHE	See COC				1325

Comments

Signature _____ Date 4/20/20

AECOM

Well/Piezo ID: ASH-04 CCR COPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Sun, 70°, Breezy
Collector(s): J. Hurshman, C. Ahrendt
Date: 4/6/20
Time: Start 1320
Finish

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length: NM
b. Water Table Depth: 12.35 4/6/20
c. Casing Material: PVC
d. Casing Diameter: 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1336	Initial	13.61	8.10	5464	49.1	3.63	51.2	clear	12.63
1340	0.2	12.80	8.00	5411	50.5	0.79	67.6	Cloudy	12.76
1344	0.4	12.41	7.99	5426	52.5	0.48	61.4	"	12.84
1348	0.7	12.27	7.97	5426	54.1	0.38	31.9	"	12.87
1352	1.0	12.25	7.96	5425	54.9	0.33	14.3	"	12.90
1356	1.3	12.28	7.97	5412	55.5	0.30	9.55	"	12.92

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☒
Has required turbidity been reached	☒	☐	☐
Have parameters stabilized	☒	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-04-CCR	See COC				1400
ASH-04-COPHE	See COC				1400

Comments

Signature _____ Date 4/10/20

AECOM

Well/Piezo ID: ASH-05 CP pHE/CCR

Ground Water Sample Collection Record

Client: PRPA Date: 4/13/20
Project No: Time: Start 9:00
Site Location: Rawhide Finish
Weather Conds: 19°, cloudy, light snow Collector(s) J. Hurshman, C. Ahrendt

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length NM c. Casing Material PVC e. Length of Water Column ______ (a-b)

b. Water Table Depth 20.41 d. Casing Diameter 2 f. Calculated Well Volume (see back) ______

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _______ well volumes) __ Low flow

c. Field Testing Equipment Used: Make Model Serial Number
YSI 556
Hach 2100

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _______ Page #_______

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
923	Initial	10.25	6.25	5023	105.8	4.51	18.1	cloudy	20.73
925	0.1	10.97	6.39	5025	95.0	2.36	16.4	clear	20.80
930	0.5	11.18	6.56	4994	85.8	1.09	16.9	"	20.80
935	0.9	11.05	6.63	4984	78.0	0.87	15.1	"	20.75
940	1.2	10.87	6.73	4969	71.6	0.88	14.6	"	20.75
945	1.6	10.97	6.80	4961	65.8	0.83	12.8	"	20.74
950	1.9	10.85	6.76	4959	62.4	0.71	8.46	"	20.75
955	2.2	11.10	6.90	4946	58.9	0.60	7.13	"	20.75
1000	2.5	10.88	6.94	4969	57.0	0.61	5.53	"	20.76
1005	2.8	10.78	6.92	4948	57.1	0.50	4.32	"	20.75
1010	3.1	10.68	6.95	4959	55.7	0.56	4.84	"	20.76

e. Acceptance criteria pass/fail — Yes / No / N/A
- Has required volume been removed: ☐ ☐ ☑ (N/A)
- Has required turbidity been reached: ☑ (Yes) ☐ ☐
- Have parameters stabilized: ☑ (Yes) ☐ ☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-05-CCR	See COC	→	→	→	1015
ASH-05-CPpHE	"	→	→	→	1015

Comments

Signature [signature] Date 4/13/2020

AECOM

Well/Piezo ID: ASH-06

CCR
CDPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Sun, 50°, breezy
Collector(s) J. Hurshman, C. Ahrendt
Date: 4/20/20
Time: Start 1030
Finish

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 62.71
c. Casing Material PVC
d. Casing Diameter 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1041	1 inflow	12.86	8.35	741	73.6	4.12	23.8	clear	63.00
1044	0.2	12.71	8.26	686	76.8	3.82	11.7	clear	63.29
1047	0.4	12.68	8.27	637	76.9	5.81	6.4	clear	63.60
1050	0.7	12.69	8.28	620	77.9	5.95	5.43	clear	63.87
1053	1.0	12.81	8.19	609	79.9	6.10	5.79	clear	64.13

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: _____

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-06-COC	See COC				1100
ASH-06-CDPHE	See COC				1100

Comments: Well went dry following bailers - let recharge to complete

Signature _____ Date 4/20/20

AECOM

Well/Piezo ID: ASH-07 CCR COPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Sun, 55°, windy
Collector(s) J. Hurshman, C. Ahrendt
Date: 4/10/20
Time: Start 1115
Finish

WATER LEVEL DATA: (measured from Top of Casing)
Well ☑ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 13.11 4/6/2020
c. Casing Material PVC
d. Casing Diameter 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1134	initial	13.68	7.59	5872	59.2	3.27	9.08	cloudy	12.47
1138	0.2	13.00	7.57	5842	60.8	1.00	8.90	"	13.65
1141	0.4	12.84	7.52	5822	64.5	0.77	8.31	clear	13.62
1144	0.8	12.64	7.51	5893	66.7	0.70	8.88	clear	13.61
1148	1.1	12.49	7.50	5961	67.6	0.66	7.53	clear	13.65
1152	1.4	12.60	7.48	6077	68.5	0.61	6.36	clear	13.68

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☑ 10%	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-07-CCR	See COC				1200
ASH-07-COPHE	See COC				1200

Comments _____

Signature _____ Date 4/10/20

AECOM

Well/Piezo ID: ASH-08 CCR CDPHE

Ground Water Sample Collection Record

Client: PRPA
Project No:
Site Location: Rawhide
Weather Conds: Cloudy, 20°, Collector(s) J. Hurshman, C. Ahrendt
Date: 4/13/2020
Time: Start 1205
Finish

WATER LEVEL DATA: (measured from Top of Casing)

Well ☒ Piezometer ☐

a. Total Well Length NM
b. Water Table Depth 9.43 4/6/2020
c. Casing Material PVC
d. Casing Diameter 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) __ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI 556		
Hach 2100		

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	0.03	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1203	Initial	7.76	7.10	4469	54.5	4.89	4.23	Clear	9.82
1207	0.2	8.91	7.13	4438	53.8	2.10	4.40	"	10.85
1211	0.4	9.17	7.16	4489	53.2	1.04	4.67	"	11.75
1215	0.7	9.23	7.16	4485	53.1	0.76	3.52	"	12.65
1219	1.0	9.17	7.16	4494	52.7	0.56	2.65	"	13.45
1223	1.2	9.26	7.18	4486	52.7	0.59	3.37	"	14.21
1228	1.5	9.11	7.18	4495	52.8	0.56	2.67	"	14.78

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-08-CCR	See COC				1235
ASH-08-CDPHE	"				1235

Comments

Signature _____ Date 4/13/2020

AECOM

Well/Piezo ID: ASH-02

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: cloudy, windy Collector(s) J. Dobkowski, C. Ahrendt
Date: 7/16/2020
Time: Start 8:00 Finish 10:40

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 53.70 c. Casing Material PVC e. Length of Water Column 50.77 (a-b)
b. Water Table Depth 2.93 d. Casing Diameter 4" f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method __bladder pump_____

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	06M1171AF
HACH		17120C063451

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
0820	1L	13.21	6.48	4071	74.1	1.90	7.09	clear	3.60
0823	2L	13.10	6.57	4085	74.9	1.75	6.75	clear	4.25
0829	3.8L	14.46	6.81	4055	69.0	1.40	4.32	clear	4.68
0833	4.1L	14.83	6.90	4062	66.2	1.39	4.90	clear	4.83
0839	5.0L	15.01	7.01	4071	64.9	1.39	3.71	clear	5.02
0842	5.2L	15.02	7.06	4071	64.1	1.35	4.14	"	5.18
0845	5.4L	15.06	7.08	4072	64.1	1.32	3.38	"	5.25

200 mL/min
410 mL/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-02 -CDPHE	See COC			→	0900
ASH-02 -CCR	See COC			→	0900

Comments DUP-01-CCR was collected, MS/MSD collected

Signature JDobkowski Date 7/16/2020

AECOM

Well/Piezo ID: ASH-06

Ground Water Sample Collection Record

Client: Platte River Power Authority — Date 07/14/20
Project No: CDPHE = 60630004, CCR = 60630103 — Time: Start 15:25 (7/14/20)
Site Location: Rawhide Generating Station — Finish 9:45 (7/15/20) (7/20/20)
Weather Conds: sunny, windy — Collector(s) J. Dobkowski, C. Ahrendt

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 70.09 c. Casing Material PVC e. Length of Water Column 7.34 (a-b)

b. Water Table Depth 62.75 d. Casing Diameter 2" f. Calculated Well Volume (see back) ____

Flow Rate (< 500 ml/min): ____

WELL PURGING DATA

a. Purge Method bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ ____ well volumes) ____ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	06M1171AF
HACH		17120C063451

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # ____ Page # ____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
7/14/20 15:27	0	16.75	8.25	706	44.1	6.40	7.35	Clear	62.97
15:33	0.5	14.13	7.29	658	~~[illegible]~~ 50	6.30	7.24	"	63.60
15:37	0.75	13.78	7.19	631	53.5	7.23	4.60	"	63.90
15:42	1.0	13.77	7.15	618	56.3	7.84	2.76	"	64.30
15:47	1.25	13.67	7.13	618	58.4	7.61	3.82	"	64.90
15:52	1.50	13.35	7.13	619	59.4	6.95	2.15	"	65.30
15:57	1.75	13.68	7.15	623	61.0	6.63	0.89	"	65.75
16:00		14.32	7.19	623	59.9	6.49	1.38	"	66.23
well	purged	dry	letting	recharge					
7/15/20									
08:10	0.25	17.46	7.20	639	83.1	7.36	1.11	"	65.72
well	went	dry	during	sampling					
7/16/20 well	went	dry	during	sampling					
7/20/20 13:37	0	19.85	8.61	720	42.5	9.50	10.8	clear	67.82
13:40	0.5L	17.47	8.20	711	61.8	7.16	7.76	"	67.90
13:43	0.75L	16.43	7.75	689	55.3	7.15	4.37	"	68.15
13:46	1.0L	15.84	7.71	681	55.3	7.08	3.87	"	~~[illegible]~~ 68.28

13:50 well went dry during sampling

e. Acceptance criteria pass/fail — Yes / No / N/A
- Has required volume been removed ☐ ☑ ☐
- Has required turbidity been reached ☐ ☑ ☐
- Have parameters stabilized ☐ ☑ ☐

If no or N/A - Explain below.
well purged dry (twice), Temp change due to weather conditions

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-06-CDPHE	See COC	→		→	0820 / 1400 7/15/20-7/20/20
~~ASH-06-CCR~~	~~See COC~~	→		→	~~[illegible]~~
~~ASH-06-CDPHE~~	~~See COC~~			→	1400
~~ASH-06-CCR~~	~~See COC~~			→	7/20/20

Comments ____

Signature Jeff Dobkowski — Date 7/16/20

AECOM

Well/Piezo ID: ASH-07

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: Sunny, 86 °F Collector(s) J. Dobkowski, C. Ahrendt
Date: 7/16/20
Time: Start 1220
Finish 1345

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 30.08
b. Water Table Depth 14.02
c. Casing Material PVC
d. Casing Diameter 2"
e. Length of Water Column 16.06 (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	06M1171AF
HACH		17120C063451

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
1225	0	15.61	7.48	6667	78.7	5.65	21.6	clear	14.51
1230	2L	13.60	6.98	6424	46.9	0.78	17.5	clear	15.00
1235	3.75 L	13.01	6.99	6465	48.8	0.61	14.0	"	15.11
1240	5.2L	14.72	6.93	6589	45.2	0.55	5.82	"	14.61
1243	6L	14.80	6.99	6705	44.1	0.53	5.06	"	14.55
1246	6.2L	14.98	7.03	6783	43.5	0.47	7.73	"	14.49
1249	6.5L	15.06	7.02	6799	44.6	0.42	5.09	"	14.45
1252	6.7L	15.06	7.01	6877	45.3	0.40	4.92	"	14.44
1255	7.0L	14.95	7.00	6921	45.8	0.38	3.80	"	14.44

350 mL/min
- 100 mL/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-07-CDPHE	See COC			→	1315
ASH-07 -CCR	See COC			→	^1315

Comments _____

Signature Jeff Dobkowski Date 7/16/2020

AECOM

Well/Piezo ID: ASH-08

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: Sunny, 84°F Collector(s) J. Dobkowski, C. Ahrendt
Date: 7/16/20
Time: Start 1040
Finish 1215

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length 29.92
b. Water Table Depth 9.95
c. Casing Material PVC
d. Casing Diameter 2"
e. Length of Water Column 19.97 (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	06M1171AF
HACH		17120C063451

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft	
1044	0	15.45	7.55	4487	36.9	20.68	17.5	clear	10.65	220 mL/min
1048	2L	13.15	6.73	4419	47.8	1.11	15.2	"	12.55	
1053	3.5L	12.71	6.53	4420	48.6	0.64	6.28	"	14.45	
1058	6L	12.78	6.18	4418	47.4	0.49	7.04	"	16.39	
1103	7.5L	12.20	6.50	4425	46.0	0.50	4.15	"	17.96	
1108	9.5L	12.72	6.51	4421	45.2	0.35	8.73	"	19.36	100 mL/min
1112	11L	14.58	6.60	4392	41.7	0.36	5.64	"	19.51	
1115	11.7L	15.24	6.73	4426	40.7	0.34	2.62	"	19.45	
1118	11.8L	15.37	6.86	4451	40.6	0.31	3.43	"	19.45	
1121	12.1L	15.40	6.93	4442	41.9	0.29	2.69	"	19.42	

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-08-CDPHE	See COC			→	1130
ASH-08-CCR	See COC			→	1130

Comments _____

Signature J Dobkowski Date 7/16/20

AECOM

Well/Piezo ID: ASH-01

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: windy, cool Collector(s) J. Dobkowski, G. Dawson
Date: 10/05/20
Time: Start 8:55
Finish 10:00

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 32.25
b. Water Table Depth 13.36
c. Casing Material PVC
d. Casing Diameter 4"
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
8:58	—	12.12	7.14	3755	32.0	1.95	4.37	clear	13.91
9:03	NM	12.15	7.25	3755	30.1	1.70	4.52	clear	13.92
9:06	NM	12.90	7.30	3760	29.8	1.68	4.01	clear	13.90
9:09	NM	12.95	7.31	3754	29.7	1.65	4.11	clear	13.93

300 mL/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-01 -CDPHE	See COC			→	9:15
ASH-01 -CCR	See COC			→	9:15

Comments _____

Signature _____ Date 10/05/2020

AECOM

Well/Piezo ID: ASH-02

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: Cool, Sunny Collector(s) J. Dobkowski, G. Dawson

Date: 10/9/20
Time: Start 7:50
Finish 10:05

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 53.43
b. Water Table Depth 4.42
c. Casing Material PVC
d. Casing Diameter 4"
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft	
8:02	0	13.33	6.87	4351	65.0	4.41	12.2	clear	4.33	200mL/min
8:05		12.76	6.99	4270	42.9	2.07	6.28	"	4.95	
8:09		12.59	7.41	4256	42.0	1.50	3.89	"	5.41	150 mL/min
8:13		12.75	7.39	4238	41.1	1.32	3.66	"	5.75	
8:16		12.80	7.41	4240	39.8	1.23	4.63	"	5.82	
8:19		12.89	7.45	4236	38.6	1.21	3.41	"	5.93	

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-02 -CDPHE	See COC			→	8:30
ASH-02 -CCR	See COC			→	8:30

Comments DUP-03 collected for CDPHE, DUP-04 collected for CCR

Signature J. Dobkowski Date 10/09/2020

AECOM

Well/Piezo ID: ASH-03 -CDPHE -CCR

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: clear, 32° Collector(s) J. Dobkowski, G. Dawson
Date: 10/15/20
Time: Start 800
Finish

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length 52.09 c. Casing Material PVC e. Length of Water Column _____ (a-b)

b. Water Table Depth 37.85 d. Casing Diameter 2 f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): 200 ml

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume L Removed (~~gal~~)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
8:37	~	10.75	7.01	4454	135.1	2.60	23.1	clear	38.93 - 200 ml
8:40	0.6	10.41	7.02	4421	20.4	1.74	19.0	"	39.13
8:43	1.2 0.17	10.96	7.05	4450	10.1	1.51	11.4	"	39.35
8:46	1.9	10.49	7.06	4467	3.9	1.56	10.2	"	39.41
8:49	2.4	11.06	7.07	4471	-0.3	1.54	9.97	"	39.54
8:52	3.0	11.07	7.07	4481	-2.7	1.91	9.16	"	39.63
8:55	3.6	11.05	7.04	4442	-6.7	1.91	8.58	"	39.65
8:58	4.2	11.04	7.04	4440	-8.3	1.46	8.32	"	39.70
9:01	4.8	11.04	7.05	4481	-10.4	1.41	5.97	"	39.72
9:04	5.4	11.06	7.04	4444	-11.2	1.42	6.16	"	39.72
9:07	6.0	11.03	7.06	4445	-12.4	1.75	5.58	"	39.75
9:10	6.6	11.03	7.05	4440	-13.3	1.48	5.74	"	39.76
9:13	7.2	11.02	7.04	4446	-14.4	1.74	3.46	"	39.80
9:16	7.8	11.00	7.06	4481	-15.5	1.71	2.78	"	39.78
9:19	8.4	11.01	7.04	4474	-17.0	1.77	3.15	"	39.76
9:22	9.0	10.99	7.06	4477	-16.5	1.74	3.01	"	39.80

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-03 -CDPHE	See COC			→	922
ASH-03 -CCR	See COC			→	

Comments Stopped purging at 9:22 and started collecting

Signature _____ Date _____

AECOM

Well/Piezo ID: ASH-04

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: cloud, 50° Collector(s) J. Dobkowski, G. Dawson

Date: 10/15/20
Time: Start 13:15
Finish 15:11

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 32.32 c. Casing Material PVC e. Length of Water Column _____ (a-b)

b. Water Table Depth 12.97 d. Casing Diameter 2 f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method __bladder pump_____

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
13:26	-	13.31	7.26	5213	0.9	1.90	77.8	clear	13.50
13:28	0.45	12.91	7.22	5300	-4.3	0.95	69.1	"	13.55
13:31	0.90	12.86	7.18	5300	-5.4	0.74	54.1	"	13.56
13:34	1.35	12.9	7.13	5244	-5.9	0.55	34.7	"	13.60
13:37	1.80	12.64	7.12	5246	-6.1	0.48	20.6	"	13.61
13:40	2.25	12.51	7.10	5293	-6.0	0.43	16.3	"	13.63
13:43	2.70	12.49	7.09	5261	-6.4	0.42	12.1	"	13.67
13:46	3.15	12.72	7.08	5264	-7.1	0.36	9.31	"	13.66
13:49	3.70	12.61	7.07	5295	-7.1	0.34	7.44	"	13.66
13:52	4.15	12.92	7.06	5285	-7.3	0.33	6.27	"	13.69
13:55	4.60	12.98	7.00	5292	-7.4	0.33	5.38	"	13.70

150 ml/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☑
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-04 -CDPHE	See COC			→	
ASH-04 -CCR	See COC			→	

Comments Started sampling 13:55

Signature _____ Date _____

AECOM

Well/Piezo ID: ASH-05

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: sunny Collector(s) J. Dobkowski, G. Dawson
Date: 10/9/20
Time: Start 10:15
Finish 11:30

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 37.22 c. Casing Material PVC e. Length of Water Column _____ (a-b)

b. Water Table Depth 20.75 d. Casing Diameter 2" f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method __bladder pump_____

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
10:22	0	14.01	7.09	5170	15.1	0.85	23.3	clear	20.93
10:25		13.65	7.11	5149	14.6	0.73	17.7	"	21.01
10:28		13.42	7.09	5141	13.9	0.64	10.8	"	21.04
10:31		13.43	7.12	5135	13.4	0.56	10.3	"	21.04
10:34		13.45	7.10	5131	13.3	0.59	9.54	"	21.05
10:37		13.64	7.09	5127	13.2	0.60	8.81	"	21.02
10:40		13.63	7.10	5124	12.9	0.57	10.2	"	21.03
10:43		13.65	7.09	5136	13.0	0.54	8.56	"	21.04
10:46		13.66	7.10	5133	13.3	0.51	7.64	"	21.05
10:49		13.69	7.11	5128	13.1	0.53	6.98	"	21.03

225 mL/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-05-CDPHE	See COC			→	11:00
ASH-05-CCR	See COC			→	11:00

Comments _____

Signature Jeff DoBkowski Date 10/9/20 20

AECOM

Well/Piezo ID: ASH-06

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: very windy Collector(s) J. Dobkowski, G. Dawson
Date: 10/12/20
Time: Start 8:00
Finish 9:25

WATER LEVEL DATA: (measured from Top of Casing) Well ☑ Piezometer ☐

a. Total Well Length 70.18 c. Casing Material PVC e. Length of Water Column _____ (a-b)
b. Water Table Depth 62.69 d. Casing Diameter 2" f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): 700

WELL PURGING DATA

a. Purge Method __bladder pump_____

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft
10/12/20 8:13	5	13.15	6.66	713	36.5	8.90	11.8	clear	63.21
8:16		12.89	7.13	673	25.8	8.44	6.72	"	63.32
8:19		12.82	7.18	669	23.7	8.70	4.26	"	63.40
8:22		12.73	7.20	659	20.5	8.68	3.79	"	63.53
8:25		12.75	7.22	655	19.1	8.71	2.84	"	63.61

100 mL/min

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below.

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-06 -CDPHE	See COC			→	8:30 10/12/20
ASH-06 -CCR	See COC			→ CCR, non radium	900 10/16/20
ASH-06 - CCR	1 L	2	HNO3	CCR Radium	940 10/20/20

Comments 10/16/20 Grab sample of CCR — no purging. Well needed to recharge.

Signature Jeff DoMSki Date 10/12/2020

10/12 - well purged dry fully bottles, letting recharge.
10/16 - Did not fill CCR radium, letting it recharge. Filled at 9:00

AECOM

Well/Piezo ID: AS14-07

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: _____ Collector(s) J. ~~Dobkowski~~, G. Dawson

Date: 10/15/20
Time: Start 10:30
Finish 13:56

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length 30.06
b. Water Table Depth 15.41
c. Casing Material PVC
d. Casing Diameter 2
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): 200

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page # _____

Time	Volume Removed (~~gal~~ L)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft	
10:38		11.43	7.04	6177	-10.6	33.02	44.0	Clear	16.03	~200ml
10:41	0.6	11.53	7.03	6209	-10.4	4.06	47.02	"	16.03	
10:44	1.2	11.74	7.03	6210	-10.5	2.57	36.05	"	16.04	
10:47	1.8	11.76	7.04	6194	-11.0	2.14	32.6	"	16.11	
10:50	2.4	12.20	7.05	6177	-11.7	2.11	31.5	"	16.14	
10:53	3.0	12.16	7.04	6222	-11.7	2.17	31.7	"	~~16.7~~	16.10
10:56	3.6	12.21	7.04	6270	-12.4	1.41	13.9	"	16.11	
10:59	4.2	12.21	7.05	6336	-12.3	1.73	9.08	"	16.11	
11:02	4.4	12.26	7.06	6340	-13.2	1.63	7.41	"	16.13	
11:05	5.4	12.35	7.04	6446	-13.3	1.47	6.19	"	16.11	
11:08	6.0	12.40	7.04	6442	-13.4	1.43	7.76	"	16.11	
11:11	6.6	12.39	7.10	6512	-12.5	1.24	5.23	"	16.14	
11:14	7.2	12.46	7.11	6524	-11.5	1.24	4.83	"	16.11	
11:17	7.8	12.51	7.12	6534	-11.5	1.16	3.87	"	16.13	
11:20	8.4	12.6	7.12	6540	-11.4	1.13	3.26	"	16.12	

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☐	☐	☐
Has required turbidity been reached	☐	☐	☐
Have parameters stabilized	☐	☐	☐

If no or N/A - Explain below.

_____

_____

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
AS14-07-CDPHE	See COC			→	1120
AS14-07-CCR	See COC			→	

Comments: Started collecting at 11:20

Signature _____ Date _____

AECOM

Well/Piezo ID: ASH-08

Ground Water Sample Collection Record

Client: Platte River Power Authority
Project No: CDPHE = 60630004, CCR = 60630103
Site Location: Rawhide Generating Station
Weather Conds: Sunny, breezy (J.) Collector(s) J. Dobkowski, G. Dawson
Date: 10/8/20
Time: Start 12:45 Finish 14:15

WATER LEVEL DATA: (measured from Top of Casing)

Well ☑ Piezometer ☐

a. Total Well Length 29.98
b. Water Table Depth 11.06
c. Casing Material PVC
d. Casing Diameter 2"
e. Length of Water Column _____ (a-b)
f. Calculated Well Volume (see back) _____

Flow Rate (< 500 ml/min): _____

WELL PURGING DATA

a. Purge Method __bladder pump

b. Acceptance Criteria defined (from workplan)
- Minimum Required Purge Volume (@ _____ well volumes) ___ Low flow

c. Field Testing Equipment Used:

Make	Model	Serial Number
YSI	556	11E101016
HACH		11120C014834

d. Field Testing Equipment Calibration Documentation Found in Field Notebook # _____ Page #_____

Time	Volume Removed (gal)	T° (C)	pH	Spec. Cond (µs/cm)	ORP	DO mg/L	Turbidity (NTU)	Color	DTW (ft)	
Stabilization	--	+/- 3%	+/- 0.1	+/- 3%	+/- 10 MV	+/- 10%	5 NTU, 10%		0.3 ft	
12:46	0	14.59	6.97	4527	1.3	1.03	13.1	clear	12.35	200 mL/min
12:50		14.20	6.97	4521	0.4	0.75	7.91	"	13.87	
12:53		14.07	6.94	4517	1.7	0.58	5.55	"	14.76	
12:57		14.06	6.93	4520	0.1	0.50	3.88	"	15.50	
13:02		13.53	6.96	4526	-0.5	0.55	5.39	"	17.06	400mL/min
13:06		13.53	6.96	4518	-0.2	1.06	5.88	"	18.54	
13:09		13.58	6.96	4518	0.1	1.25	5.74	"	19.44	
13:12		14.05	6.96	4499	1.2	1.07	3.90	"	19.67	100mL/min
13:15		15.92	6.98	4516	0.9	0.73	2.51	"	19.69	
13:18		16.34	6.96	4530	1.0	0.69	3.21	"	19.64	
13:21		16.40	7.01	4534	1.2	0.64	2.50	"	19.67	

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	☑	☐	☐
Has required turbidity been reached	☑	☐	☐
Have parameters stabilized	☑	☐	☐

If no or N/A - Explain below. Temp change due to weather conditions

SAMPLE COLLECTION: Method: bladder pump

Sample ID	Container Type	No. of Containers	Preservation	Analysis	Time
ASH-08CDPHE	See COC			→	13:30
ASH-08 -CCR	See COC			→	13:30

Comments _____

Signature JDobkowski Date 10/8/20

Appendix B

Laboratory Analytical and Data Validation Reports

January 2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60326782
Sampling Event: January 15, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: February 18, 2020
Peer Reviewer: Steve Szocik — Date Completed: February 19, 2020

This report contains the final results of the data validation conducted for the water samples collected January 15, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X[1]	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:	X		

Analyte	MS/MSD (%)	Limits (%)	RPD (%)	Limits (%)
ASH-08-CCR				
Chromium	**58/57**	75-125	1	20

% – Percent
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
RPD – Relative Percent Difference
Bold indicates a value that is outside of acceptance limits.

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>• When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.
• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td></td><td></td><td></td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
<table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02(MW-2)-CCR</td><td>DUP-2-CCR</td></tr></table>• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td>X</td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>Two equipment blanks were collected with the samples associated with this sampling event. No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60326629</td></tr><tr><td colspan="2">EB-1-CCR</td></tr><tr><td>TDS</td><td>66.0 mg/L</td></tr><tr><td colspan="2">60326782</td></tr><tr><td colspan="2">EB-2-CCR</td></tr><tr><td>TDS</td><td>9.0 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting Limits Met (Non –Radiochemistry)</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Detection Limits Mets (Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td></td><td></td><td>X</td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td></td><td></td><td>X</td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><td colspan="5">Comments</td></tr>
<tr><td colspan="5">1 – As the potential bias was considered to be low, the associated chromium result for sample ASH-08-CCR was qualified as estimated (J- m).

2 – As the TDS results were reported at concentrations>5x the concentration of the blank contamination, qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
σ – Sigma
% – Percent
± – Plus or Minus/High or Low Bias
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
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January 30, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Dear Vasanta Kalluri:
Enclosed are the analytical results for sample(s) received by the laboratory on January 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 19-016-0
Arkansas Drinking Water
Illinois Certification #: 004455
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212018-8
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60326782001	**ASH-02(MW-2)-CCR**	Water	01/15/20 09:00	01/16/20 08:20
60326782002	**DUP-2-CCR**	Water	01/15/20 08:00	01/16/20 08:20
60326782003	**EB-2-CCR**	Water	01/15/20 10:20	01/16/20 08:20
60326782004	**ASH-08-CCR**	Water	01/15/20 10:45	01/16/20 08:20
60326782005	**ASH-07-CCR**	Water	01/15/20 12:30	01/16/20 08:20
60326782006	**ASH-06-CCR**	Water	01/15/20 14:00	01/16/20 08:20

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SAMPLE ANALYTE COUNT

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60326782001	**ASH-02(MW-2)-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782002	**DUP-2-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782003	**EB-2-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782004	**ASH-08-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782005	**ASH-07-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60326782006	**ASH-06-CCR**	EPA 6010	LRS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	JLH	1	PASI-K
		SM 2540C	BLA	1	PASI-K
		EPA 9056	CNB	3	PASI-K

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: ASH-02(MW-2)-CCR **Lab ID: 60326782001** Collected: 01/15/20 09:00 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	**2010**	ug/L	100	1	01/17/20 15:00	01/20/20 14:44	7440-42-8	
Calcium	**169000**	ug/L	200	1	01/17/20 15:00	01/20/20 14:44	7440-70-2	
Lithium	**290**	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:44	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-38-2	
Barium	**19.8**	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:35	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:31	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:31	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7439-92-1	
Molybdenum	**8.2**	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:31	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:50	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**4320**	mg/L	66.7	1		01/21/20 13:51		
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	**21.4**	mg/L	2.0	2		01/21/20 19:36	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 19:34	16984-48-8	
Sulfate	**2420**	mg/L	200	200		01/21/20 19:52	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: DUP-2-CCR **Lab ID: 60326782002** Collected: 01/15/20 08:00 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	**2000**	ug/L	100	1	01/17/20 15:00	01/20/20 14:46	7440-42-8	
Calcium	**170000**	ug/L	200	1	01/17/20 15:00	01/20/20 14:46	7440-70-2	
Lithium	**294**	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:46	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-38-2	
Barium	**20.5**	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:36	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:35	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:35	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7439-92-1	
Molybdenum	**8.2**	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:35	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**3490**	mg/L	66.7	1		01/21/20 13:51		
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	**21.3**	mg/L	2.0	2		01/21/20 20:08	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 20:06	16984-48-8	
Sulfate	**2440**	mg/L	200	200		01/21/20 20:24	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: EB-2-CCR **Lab ID: 60326782003** Collected: 01/15/20 10:20 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	ND	ug/L	100	1	01/17/20 15:00	01/20/20 14:53	7440-42-8	
Calcium	ND	ug/L	200	1	01/17/20 15:00	01/20/20 14:53	7440-70-2	
Lithium	ND	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:53	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-38-2	
Barium	ND	ug/L	1.0	1	01/21/20 14:20	01/30/20 14:20	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:51	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:51	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:51	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:55	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**9.0**	mg/L	5.0	1		01/21/20 13:51		
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	ND	mg/L	1.0	1		01/20/20 20:38	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 20:38	16984-48-8	
Sulfate	ND	mg/L	1.0	1		01/20/20 20:38	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: ASH-08-CCR **Lab ID: 60326782004** Collected: 01/15/20 10:45 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	**960**	ug/L	100	1	01/17/20 15:00	01/20/20 14:55	7440-42-8	
Calcium	**447000**	ug/L	200	1	01/17/20 15:00	01/20/20 14:55	7440-70-2	M1
Lithium	**297**	ug/L	10.0	1	01/17/20 15:00	01/20/20 14:55	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-36-0	
Arsenic	**1.0**	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-38-2	
Barium	**19.7**	ug/L	10.0	10	01/21/20 14:20	01/30/20 14:37	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:56	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 14:56	7440-43-9	
Chromium	**1.8**	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-47-3	M1
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7439-92-1	
Molybdenum	**1.9**	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7439-98-7	
Selenium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 14:56	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 11:57	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**4560**	mg/L	100	1		01/21/20 13:51		D6
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	**19.3**	mg/L	1.0	1		01/20/20 21:10	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 21:10	16984-48-8	
Sulfate	**2800**	mg/L	500	500		01/21/20 20:40	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: ASH-07-CCR **Lab ID: 60326782005** Collected: 01/15/20 12:30 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	**781**	ug/L	100	1	01/17/20 15:00	01/20/20 15:02	7440-42-8	
Calcium	**434000**	ug/L	200	1	01/17/20 15:00	01/20/20 15:02	7440-70-2	
Lithium	**537**	ug/L	10.0	1	01/17/20 15:00	01/20/20 15:02	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-36-0	
Arsenic	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-38-2	
Barium	**19.1**	ug/L	5.0	5	01/21/20 14:20	01/30/20 14:41	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:21	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:21	7440-43-9	
Chromium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-47-3	
Cobalt	**1.3**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7439-92-1	
Molybdenum	**1.0**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7439-98-7	
Selenium	**51.0**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:21	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 12:09	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**6620**	mg/L	125	1		01/21/20 13:51		
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	**74.1**	mg/L	10.0	10		01/21/20 21:59	16887-00-6	
Fluoride	ND	mg/L	0.20	1		01/20/20 23:18	16984-48-8	
Sulfate	**3990**	mg/L	500	500		01/21/20 22:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Sample: ASH-06-CCR **Lab ID: 60326782006** Collected: 01/15/20 14:00 Received: 01/16/20 08:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
Boron	**304**	ug/L	100	1	01/17/20 15:00	01/20/20 15:04	7440-42-8	
Calcium	**24300**	ug/L	200	1	01/17/20 15:00	01/20/20 15:04	7440-70-2	
Lithium	**56.3**	ug/L	10.0	1	01/17/20 15:00	01/20/20 15:04	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
Antimony	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-36-0	
Arsenic	**1.2**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-38-2	
Barium	**61.6**	ug/L	10.0	10	01/21/20 14:20	01/30/20 14:42	7440-39-3	
Beryllium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:26	7440-41-7	
Cadmium	ND	ug/L	0.50	1	01/21/20 14:20	01/29/20 15:26	7440-43-9	
Chromium	**2.3**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-47-3	
Cobalt	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-48-4	
Lead	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7439-92-1	
Molybdenum	**17.3**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7439-98-7	
Selenium	**23.5**	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7782-49-2	
Thallium	ND	ug/L	1.0	1	01/21/20 14:20	01/29/20 15:26	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
Mercury	ND	ug/L	0.20	1	01/24/20 12:41	01/27/20 12:11	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
Total Dissolved Solids	**500**	mg/L	10.0	1		01/21/20 13:51		
9056 IC Anions	Analytical Method: EPA 9056							
Chloride	**7.0**	mg/L	1.0	1		01/20/20 23:51	16887-00-6	
Fluoride	**0.72**	mg/L	0.20	1		01/20/20 23:51	16984-48-8	
Sulfate	**68.3**	mg/L	10.0	10		01/21/20 22:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

QC Batch: 634822 Analysis Method: EPA 7470
QC Batch Method: EPA 7470 Analysis Description: 7470 Mercury
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2584400 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	01/27/20 11:32	

LABORATORY CONTROL SAMPLE: 2584401

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.5	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2584402 2584403

Parameter	Units	60326782004 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	5	5	5.3	5.4	105	107	75-125	1	20	

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

QC Batch: 633715 Analysis Method: EPA 6010
QC Batch Method: EPA 3010 Analysis Description: 6010 MET
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2580300 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	01/20/20 14:30	
Calcium	ug/L	ND	200	01/20/20 14:30	
Lithium	ug/L	ND	10.0	01/20/20 14:30	

LABORATORY CONTROL SAMPLE: 2580301

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Lithium	ug/L	1000	996	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2580302 2580303

Parameter	Units	60326782004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	960	1000	1000	1980	1960	102	100	75-125	1	20	
Calcium	ug/L	447000	10000	10000	453000	452000	58	51	75-125	0	20	M1
Lithium	ug/L	297	1000	1000	1300	1290	100	99	75-125	1	20	

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

QC Batch: 634101 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2581912 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	01/29/20 13:22	
Arsenic	ug/L	ND	1.0	01/29/20 13:22	
Barium	ug/L	ND	1.0	01/29/20 13:22	
Beryllium	ug/L	ND	0.50	01/29/20 13:22	
Cadmium	ug/L	ND	0.50	01/29/20 13:22	
Chromium	ug/L	ND	1.0	01/29/20 13:22	
Cobalt	ug/L	ND	1.0	01/29/20 13:22	
Lead	ug/L	ND	1.0	01/29/20 13:22	
Molybdenum	ug/L	ND	1.0	01/29/20 13:22	
Selenium	ug/L	ND	1.0	01/29/20 13:22	
Thallium	ug/L	ND	1.0	01/29/20 13:22	

LABORATORY CONTROL SAMPLE: 2581914

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.3	93	80-120	
Arsenic	ug/L	40	37.2	93	80-120	
Barium	ug/L	40	36.6	91	80-120	
Beryllium	ug/L	40	39.2	98	80-120	
Cadmium	ug/L	40	37.8	94	80-120	
Chromium	ug/L	40	37.9	95	80-120	
Cobalt	ug/L	40	38.3	96	80-120	
Lead	ug/L	40	37.9	95	80-120	
Molybdenum	ug/L	40	38.4	96	80-120	
Selenium	ug/L	40	35.6	89	80-120	
Thallium	ug/L	40	36.5	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581915 2581916

Parameter	Units	60326782004 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	40	40	35.1	35.3	88	88	75-125	1	20	
Arsenic	ug/L	1.0	40	40	38.4	38.5	93	94	75-125	0	20	
Barium	ug/L	19.7	40	40	56.3	57.7	92	95	75-125	3	20	
Beryllium	ug/L	ND	40	40	37.5	37.0	94	92	75-125	1	20	
Cadmium	ug/L	ND	40	40	32.4	32.5	81	81	75-125	0	20	
Chromium	ug/L	1.8	40	40	25.0	24.8	58	57	75-125	1	20	M1
Cobalt	ug/L	ND	40	40	41.3	41.2	101	101	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2581915 2581916

Parameter	Units	60326782004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Lead	ug/L	ND	40	40	31.0	31.5	77	78	75-125	2	20	
Molybdenum	ug/L	1.9	40	40	43.6	43.7	104	105	75-125	0	20	
Selenium	ug/L	ND	40	40	36.4	36.5	90	91	75-125	0	20	
Thallium	ug/L	ND	40	40	31.4	31.6	78	79	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

QC Batch: 633990 Analysis Method: SM 2540C
QC Batch Method: SM 2540C Analysis Description: 2540C Total Dissolved Solids
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2581324 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	01/21/20 13:49	

LABORATORY CONTROL SAMPLE: 2581325

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	969	97	80-120	

SAMPLE DUPLICATE: 2581326

Parameter	Units	60326769011 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	384	353	8	10	

SAMPLE DUPLICATE: 2581327

Parameter	Units	60326782004 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4560	5360	16	10	D6

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

QC Batch: 633872 Analysis Method: EPA 9056
QC Batch Method: EPA 9056 Analysis Description: 9056 IC Anions
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

METHOD BLANK: 2580991 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/20/20 09:42	
Fluoride	mg/L	ND	0.20	01/20/20 09:42	
Sulfate	mg/L	ND	1.0	01/20/20 09:42	

METHOD BLANK: 2581483 Matrix: Water
Associated Lab Samples: 60326782001, 60326782002, 60326782003, 60326782004, 60326782005, 60326782006

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	01/21/20 12:44	
Fluoride	mg/L	ND	0.20	01/21/20 12:44	
Sulfate	mg/L	ND	1.0	01/21/20 12:44	

LABORATORY CONTROL SAMPLE: 2580992

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	105	80-120	

LABORATORY CONTROL SAMPLE: 2581484

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	95	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2580994 2580995

Parameter	Units	60326629001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	116	50	50	168	167	104	101	80-120	1	15	
Fluoride	mg/L	0.56	2.5	2.5	3.4	3.5	114	118	80-120	3	15	
Sulfate	mg/L	362	250	250	627	618	106	102	80-120	1	15	

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QUALITY CONTROL DATA

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2580996 2580997

Parameter	Units	60326782004 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	19.3	5	5	24.9	24.9	112	114	80-120	0	15	E
Fluoride	mg/L	ND	2.5	2.5	2.7	2.7	106	105	80-120	2	15	
Sulfate	mg/L	2800	2500	2500	5550	5520	110	109	80-120	1	15	

SAMPLE DUPLICATE: 2580993

Parameter	Units	60326479001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	16.9	16.8	0	15	
Fluoride	mg/L	0.21	0.21	1	15	
Sulfate	mg/L	15.1	15.0	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

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.

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

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

TNI - The NELAC Institute.

LABORATORIES

PASI-K	Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
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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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRPA RAWHIDE CCR
Pace Project No.: 60326782

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60326782001	**ASH-02(MW-2)-CCR**	EPA 3010	633715	EPA 6010	633760
60326782002	**DUP-2-CCR**	EPA 3010	633715	EPA 6010	633760
60326782003	**EB-2-CCR**	EPA 3010	633715	EPA 6010	633760
60326782004	**ASH-08-CCR**	EPA 3010	633715	EPA 6010	633760
60326782005	**ASH-07-CCR**	EPA 3010	633715	EPA 6010	633760
60326782006	**ASH-06-CCR**	EPA 3010	633715	EPA 6010	633760
60326782001	**ASH-02(MW-2)-CCR**	EPA 3010	634101	EPA 6020	634168
60326782002	**DUP-2-CCR**	EPA 3010	634101	EPA 6020	634168
60326782003	**EB-2-CCR**	EPA 3010	634101	EPA 6020	634168
60326782004	**ASH-08-CCR**	EPA 3010	634101	EPA 6020	634168
60326782005	**ASH-07-CCR**	EPA 3010	634101	EPA 6020	634168
60326782006	**ASH-06-CCR**	EPA 3010	634101	EPA 6020	634168
60326782001	**ASH-02(MW-2)-CCR**	EPA 7470	634822	EPA 7470	634904
60326782002	**DUP-2-CCR**	EPA 7470	634822	EPA 7470	634904
60326782003	**EB-2-CCR**	EPA 7470	634822	EPA 7470	634904
60326782004	**ASH-08-CCR**	EPA 7470	634822	EPA 7470	634904
60326782005	**ASH-07-CCR**	EPA 7470	634822	EPA 7470	634904
60326782006	**ASH-06-CCR**	EPA 7470	634822	EPA 7470	634904
60326782001	**ASH-02(MW-2)-CCR**	SM 2540C	633990		
60326782002	**DUP-2-CCR**	SM 2540C	633990		
60326782003	**EB-2-CCR**	SM 2540C	633990		
60326782004	**ASH-08-CCR**	SM 2540C	633990		
60326782005	**ASH-07-CCR**	SM 2540C	633990		
60326782006	**ASH-06-CCR**	SM 2540C	633990		
60326782001	**ASH-02(MW-2)-CCR**	EPA 9056	633872		
60326782002	**DUP-2-CCR**	EPA 9056	633872		
60326782003	**EB-2-CCR**	EPA 9056	633872		
60326782004	**ASH-08-CCR**	EPA 9056	633872		
60326782005	**ASH-07-CCR**	EPA 9056	633872		
60326782006	**ASH-06-CCR**	EPA 9056	633872		

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Sample Condition Upon Receipt

WO# : 60326782

60326782

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 7219 2984 7737 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 2.4 **Corr. Factor** +0.0 **Corrected** 2.4

Date and initials of person examining contents: MB 1/14/20

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Geoff Webb	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☑ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☑ OTHER CCR

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02(MW-2)-CCR	WT	G	—	—	1.15.20	9:00	—	3	X		X							X	X	X	X	X	N	60326782
2	DUP-2-CCR	WT	G	—	—	1.15.20	—	—	3	X		X							X	X	X	X	X	N	
3	EB-2-CCR	WT	G	—	—	1.15.20	10:20	—	3	X		X							X	X	X	X	X	N	
4	ASH-08-CCR	WT	G	—	—	1.15.20	10:45	—	3	X		X							X	X	X	X	X	N	
5	ASH-08-CCR	WT	G	—	—	1.15.20	10:45	—	4	X		X							X	X	X	X		N	MS / MSD
6	ASH-07-CCR	WT	G	—	—	1.15.20	12:30	—	3	X		X							X	X	X	X	X	N	
7	ASH-06-CCR	WT	G	—	—	1.15.20	14:00	—	3	X		X							X	X	X	X	X	N	
8																									
9						WW																			
10						1/15/20																			
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Wes Weichert / AECOM	1/15/20	1830	Receipt / FedEx	1.16.20	0820	2.4	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE	
PRINT Name of SAMPLER:	Wes Weichert
SIGNATURE of SAMPLER:	Wes Weichert
DATE Signed (MM/DD/YY):	01/15/20

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60327004
Sampling Event: January 15, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: February 18, 2020
Peer Reviewer: Steve Szocik — Date Completed: February 19, 2020

This report contains the final results of the data validation conducted for the water samples collected January 15, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. **Analyte** / **Concentration** **MB-1845078** Radium-228 / 0.287 ± 0.246 pCi/L ± – Plus or Minus MB – Method Blank pCi/L – Picocuries Per Liter		X[1]	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and the lab duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
<table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02(MW-2)-CCR</td><td>DUP-2-CCR</td></tr></table>
The agreement between parent sample results and the lab duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.</td><td>X</td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60326744</td></tr><tr><td colspan="2">EB-1-CCR</td></tr><tr><td>Radium-228</td><td>0.453 ± 0.368 pCi/L</td></tr><tr><td>Total Radium</td><td>0.453 ± 0.804 pCi/L</td></tr><tr><td colspan="2">60327004</td></tr><tr><td colspan="2">EB-2-CCR</td></tr><tr><td>Radium-226</td><td>0.160 ± 0.555 pCi/L</td></tr><tr><td>Radium-228</td><td>0.0508 ± 0.311 pCi/L</td></tr><tr><td>Total Radium</td><td>0.211 ± 0.866 pCi/L</td></tr></table>± – Plus or Minus
pCi/L – Picocuries Per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting Limits Met
(Non –Radiochemistry)</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td></td><td></td><td>X</td></tr>
<tr><td>Detection Limits Mets
(Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td>X</td><td></td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><td colspan="5">Comments</td></tr>
<tr><td colspan="5">1 – The associated radium-228 sample results reported at concentrations <5x the concentration of the blank contamination were qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

2 – The associated radium-226, radium-228, and total radium sample results reported at concentrations <5x the concentration of the blank contamination were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
σ – Sigma
pCi/L – Picocuries Per Liter
% – Percent
± – Plus or Minus/High or Low Bias
be – Equipment Blank
bl – Laboratory Blank Contamination
DER – Duplicate Error Ration
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable

Pace Analytical Services, LLC
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(913)599-5665

February 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Dear Vasanta Kalluri:
Enclosed are the analytical results for sample(s) received by the laboratory on January 16, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60327004001	**ASH-02(MW-2)-CCR**	Water	01/15/20 09:00	01/16/20 09:10
60327004002	**DUP-2-CCR**	Water	01/15/20 08:00	01/16/20 09:10
60327004003	**EB-2-CCR**	Water	01/15/20 10:20	01/16/20 09:10
60327004004	**ASH-08-CCR**	Water	01/15/20 10:45	01/16/20 09:10
60327004005	**ASH-08-CCR MS**	Water	01/15/20 10:45	01/16/20 09:10
60327004006	**ASH-08-CCR MSD**	Water	01/15/20 10:45	01/16/20 09:10
60327004007	**ASH-07-CCR**	Water	01/15/20 12:30	01/16/20 09:10
60327004008	**ASH-06-CCR**	Water	01/15/20 14:00	01/16/20 09:10

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60327004001	**ASH-02(MW-2)-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004002	**DUP-2-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004003	**EB-2-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004004	**ASH-08-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004005	**ASH-08-CCR MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60327004006	**ASH-08-CCR MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60327004007	**ASH-07-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA
60327004008	**ASH-06-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-02(MW-2)-CCR **Lab ID: 60327004001** Collected: 01/15/20 09:00 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**-0.175 ± 0.575 (1.20) C:NA T:85%**	pCi/L	01/28/20 15:06	13982-63-3	
Radium-228	EPA 904.0	**0.652 ± 0.365 (0.672) C:88% T:89%**	pCi/L	01/28/20 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.652 ± 0.940 (1.87)**	pCi/L	01/30/20 12:03	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: DUP-2-CCR **Lab ID: 60327004002** Collected: 01/15/20 08:00 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.194 ± 0.511 (0.913) C:NA T:90%**	pCi/L	01/28/20 15:06	13982-63-3	
Radium-228	EPA 904.0	**0.546 ± 0.355 (0.682) C:88% T:90%**	pCi/L	01/28/20 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.740 ± 0.866 (1.60)**	pCi/L	01/30/20 12:03	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: EB-2-CCR **Lab ID: 60327004003** Collected: 01/15/20 10:20 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.160 ± 0.555 (0.998) C:NA T:96%**	pCi/L	01/28/20 15:06	13982-63-3	
Radium-228	EPA 904.0	**0.0508 ± 0.311 (0.710) C:88% T:86%**	pCi/L	01/28/20 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.211 ± 0.866 (1.71)**	pCi/L	01/30/20 12:03	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-08-CCR **Lab ID: 60327004004** Collected: 01/15/20 10:45 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.0379 ± 0.302 (0.626) C:NA T:84%**	pCi/L	01/28/20 15:21	13982-63-3	
Radium-228	EPA 904.0	**0.449 ± 0.316 (0.615) C:87% T:97%**	pCi/L	01/28/20 12:52	15262-20-1	
Total Radium	Total Radium Calculation	**0.487 ± 0.618 (1.24)**	pCi/L	01/30/20 12:03	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-08-CCR MS **Lab ID: 60327004005** Collected: 01/15/20 10:45 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**124.31 %REC ± NA (NA) C:NA T:NA**	pCi/L	01/28/20 15:21	13982-63-3	
Radium-228	EPA 904.0	**78.78 %REC ± NA (NA) C:NA T:NA**	pCi/L	01/28/20 12:52	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-08-CCR MSD **Lab ID: 60327004006** Collected: 01/15/20 10:45 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**118.43 %REC 4.84 RPD ± NA (NA) C:NA T:NA**	pCi/L	01/28/20 15:21	13982-63-3	
Radium-228	EPA 904.0	**78.45 %REC 0.43 RPD ± NA (NA) C:NA T:NA**	pCi/L	01/28/20 12:53	15262-20-1	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-07-CCR **Lab ID: 60327004007** Collected: 01/15/20 12:30 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.175 ± 0.370 (0.666) C:NA T:93%**	pCi/L	01/28/20 15:21	13982-63-3	
Radium-228	EPA 904.0	**0.136 ± 0.261 (0.574) C:89% T:87%**	pCi/L	01/28/20 12:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.311 ± 0.631 (1.24)**	pCi/L	01/30/20 12:03	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Sample: ASH-06-CCR **Lab ID: 60327004008** Collected: 01/15/20 14:00 Received: 01/16/20 09:10 Matrix: Water
PWS: Site ID: Sample Type:

Parameters	Method	Act ± Unc (MDC) Carr Trac	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	**0.122 ± 0.393 (0.757) C:NA T:84%**	pCi/L	01/28/20 15:21	13982-63-3	
Radium-228	EPA 904.0	**0.690 ± 0.346 (0.593) C:85% T:88%**	pCi/L	01/28/20 12:53	15262-20-1	
Total Radium	Total Radium Calculation	**0.812 ± 0.739 (1.35)**	pCi/L	01/30/20 12:03	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

QC Batch: 380584 Analysis Method: EPA 904.0
QC Batch Method: EPA 904.0 Analysis Description: 904.0 Radium 228
Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007, 60327004008

METHOD BLANK: 1845078 Matrix: Water
Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007, 60327004008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.287 ± 0.246 (0.491) C:89% T:96%	pCi/L	01/28/20 12:53	

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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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

QC Batch: 380582 Analysis Method: EPA 903.1
QC Batch Method: EPA 903.1 Analysis Description: 903.1 Radium-226
Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007, 60327004008

METHOD BLANK: 1845074 Matrix: Water
Associated Lab Samples: 60327004001, 60327004002, 60327004003, 60327004004, 60327004005, 60327004006, 60327004007, 60327004008

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.203 ± 0.273 (0.687) C:NA T:91%	pCi/L	01/28/20 14:51	

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: PRPA RAWHIDE CCR
Pace Project No.: 60327004

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.

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

Act - Activity

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

(MDC) - Minimum Detectable Concentration

Trac - Tracer Recovery (%)

Carr - Carrier Recovery (%)

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

TNI - The NELAC Institute.

LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: PRPA RAWHIDE CCR
Pace Project No.: 60327004

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60327004001	**ASH-02(MW-2)-CCR**	EPA 903.1	380582		
60327004002	**DUP-2-CCR**	EPA 903.1	380582		
60327004003	**EB-2-CCR**	EPA 903.1	380582		
60327004004	**ASH-08-CCR**	EPA 903.1	380582		
60327004005	**ASH-08-CCR MS**	EPA 903.1	380582		
60327004006	**ASH-08-CCR MSD**	EPA 903.1	380582		
60327004007	**ASH-07-CCR**	EPA 903.1	380582		
60327004008	**ASH-06-CCR**	EPA 903.1	380582		
60327004001	**ASH-02(MW-2)-CCR**	EPA 904.0	380584		
60327004002	**DUP-2-CCR**	EPA 904.0	380584		
60327004003	**EB-2-CCR**	EPA 904.0	380584		
60327004004	**ASH-08-CCR**	EPA 904.0	380584		
60327004005	**ASH-08-CCR MS**	EPA 904.0	380584		
60327004006	**ASH-08-CCR MSD**	EPA 904.0	380584		
60327004007	**ASH-07-CCR**	EPA 904.0	380584		
60327004008	**ASH-06-CCR**	EPA 904.0	380584		
60327004001	**ASH-02(MW-2)-CCR**	Total Radium Calculation	381766		
60327004002	**DUP-2-CCR**	Total Radium Calculation	381766		
60327004003	**EB-2-CCR**	Total Radium Calculation	381766		
60327004004	**ASH-08-CCR**	Total Radium Calculation	381766		
60327004007	**ASH-07-CCR**	Total Radium Calculation	381766		
60327004008	**ASH-06-CCR**	Total Radium Calculation	381766		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Geoff Webb
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☒ GROUND WATER ☐ DRINKING WATER ☐ UST ☐ RCRA ☐ OTHER CCR

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02 (MW-2)-CCR	WT	G	—	—	1.15.20	9:00	-	2			X							X	X	X	N	
2	DUP-2-CCR	WT	G	—	—	1.15.20	—	-	2			X							X	X	X	N	
3	EB-2-CCR	WT	G	—	—	1.15.20	10:20	-	2			X							X	X	X	N	
4	ASH-08-CCR	WT	G	—	—	1.15.20	10:45	-	6			X							X	X	X	N	MS/MSD
5	ASH-07-CCR	WT	G	—	—	1.15.20	12:30	-	2			X							X	X	X	N	
6	ASH-06-CCR	WT	G	—	—	1.15.20	14:00	-	2			X							X	X	X	N	
7																							
8																							
9						WW																	
10						1/15/20																	
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	Wes Weichert / AECOM	1/15/20	18:30	[illegible] Pace	1/16/20	9:10	3.1	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Wes Weichert

SIGNATURE of SAMPLER: Wes Weichert DATE Signed (MM/DD/YY): 01/15/20

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical® Client Name: ACCOM Project #

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

Label LIMS Login

Tracking #: 1219 2984 2370

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 10 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 3.1 °C Correction Factor: 0 °C Final Temp: 3.1 °C

Temp should be above freezing to 6°C

pH paper Lot# 100391 Date and Initials of person examining contents: NG 11/6/20

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: NG Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):		✓		17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NG Date: 11/6/20

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Pace Analytical
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Test: Ra-226
Analyst: MK1
Date: 1/23/2020
Batch ID: 51993
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1845074
MB concentration:	-0.203
M/B Counting Uncertainty:	0.272
MB MDC:	0.687
MB Numerical Performance Indicator:	-1.46
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS51993	LCSD51993
Count Date:	1/28/2020	
Spike I.D.:	18-039	
Spike Concentration (pCi/mL):	31.434	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.654	
Target Conc. (pCi/L, g, F):	4.808	
Uncertainty (Calculated):	0.226	
Result (pCi/L, g, F):	4.008	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.928	
Numerical Performance Indicator:	-1.64	
Percent Recovery:	83.37%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	1/15/2020	1/20/2020
Sample I.D.	60327004004	35525231001
Sample MS I.D.	60327004005	35525231001MS
Sample MSD I.D.	60327004006	
Spike I.D.:	18-039	18-039
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	31.435	31.434
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	
MS Aliquot (L, g, F):	0.653	0.655
MS Target Conc.(pCi/L, g, F):	9.623	9.600
MSD Aliquot (L, g, F):	0.652	
MSD Target Conc. (pCi/L, g, F):	9.642	
MS Spike Uncertainty (calculated):	0.452	0.451
MSD Spike Uncertainty (calculated):	0.453	
Sample Result:	0.038	0.044
Sample Result Counting Uncertainty (pCi/L, g, F):	0.300	0.202
Sample Matrix Spike Result:	12.000	6.932
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.716	1.235
Sample Matrix Spike Duplicate Result:	11.457	
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.802	
MS Numerical Performance Indicator:	2.547	-3.996
MSD Numerical Performance Indicator:	1.851	
MS Percent Recovery:	124.31%	71.74%
MSD Percent Recovery:	118.43%	
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:	N/A	
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:		
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.	60327004004
Sample MS I.D.	60327004005
Sample MSD I.D.	60327004006
Sample Matrix Spike Result:	12.000
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.716
Sample Matrix Spike Duplicate Result:	11.457
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.802
Duplicate Numerical Performance Indicator:	0.428
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	4.84%
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A
MS/ MSD Duplicate Status vs RPD:	Pass
% RPD Limit:	32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

MK 1/28/2020

01-28-20 MC

Quality Control Sample Performance Assessment

Pace Analytical
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Test:	Ra-228
Analyst:	VAL
Date:	1/24/2020
Worklist:	51995
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1845078
MB concentration:	0.287
M/B 2 Sigma CSU:	0.246
MB MDC:	0.491
MB Numerical Performance Indicator:	2.29
MB Status vs Numerical Indicator:	Warning
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS51995	LCSD51995
Count Date:	1/28/2020	
Spike I.D.:	19-057	
Decay Corrected Spike Concentration (pCi/mL):	35.381	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.806	
Target Conc. (pCi/L, g, F):	4.392	
Uncertainty (Calculated):	0.316	
Result (pCi/L, g, F):	3.858	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.884	
Numerical Performance Indicator:	-1.11	
Percent Recovery:	87.85%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	1/20/2020	1/15/2020
Sample I.D.	35525228001	60327004004
Sample MS I.D.	35525228001MS	60327004005
Sample MSD I.D.		60327004006
Spike I.D.:	19-057	19-057
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	35.476	35.476
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.802	0.802
MS Target Conc.(pCi/L, g, F):	8.847	8.845
MSD Aliquot (L, g, F):		0.805
MSD Target Conc. (pCi/L, g, F):		8.810
MS Spike Uncertainty (calculated):	0.637	0.637
MSD Spike Uncertainty (calculated):		0.634
Sample Result:	0.362	0.449
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.300	0.316
Sample Matrix Spike Result:	7.327	7.418
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.471	1.498
Sample Matrix Spike Duplicate Result:		7.360
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.479
MS Numerical Performance Indicator:	-2.262	-2.218
MSD Numerical Performance Indicator:		-2.269
MS Percent Recovery:	78.73%	78.78%
MSD Percent Recovery:		78.45%
MS Status vs Numerical Indicator:	Warning	Warning
MSD Status vs Numerical Indicator:		Warning
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60327004004
Sample MS I.D.		60327004005
Sample MSD I.D.		60327004006
Sample Matrix Spike Result:		7.418
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		1.498
Sample Matrix Spike Duplicate Result:		7.360
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.479
Duplicate Numerical Performance Indicator:		0.054
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		0.43%
MS/ MSD Duplicate Status vs Numerical Indicator:		Pass
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

JJV 1-29-20

KLB 1-29-2020

April 2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334143
Sampling Event: April 10th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 22, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 10th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an RPD between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60334610</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>9.5 mg/L</td></tr><tr><td colspan="2">60335010</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>25.0 mg/L</td></tr><tr><td>Chromium</td><td>1.0 µg/L</td></tr></table>mg/L – Milligrams per Liter
µg/L – Micrograms Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

The associated chromium results were reported as non-detect and qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
µg/L – Microgram per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference

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May 04, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334143001	**ASH-07-CCR**	Water	04/10/20 12:00	04/11/20 09:10
60334143002	**ASH-04-CCR**	Water	04/10/20 14:00	04/11/20 09:10

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334143001	**ASH-07-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	CNB	3	PASI-K
60334143002	**ASH-04-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	CNB, LDB	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Sample: ASH-07-CCR **Lab ID: 60334143001** Collected: 04/10/20 12:00 Received: 04/11/20 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**760**	ug/L	100	1	04/23/20 13:50	04/24/20 16:28	7440-42-8	
Calcium	**449000**	ug/L	200	1	04/23/20 13:50	04/24/20 16:28	7440-70-2	
Lithium	**547**	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:28	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-38-2	
Barium	**14.8**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:45	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:45	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-47-3	
Cobalt	**1.3**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7439-92-1	
Molybdenum	**1.3**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7439-98-7	
Selenium	**147**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:45	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/01/20 12:10	05/04/20 12:32	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**7160**	mg/L	125	1		04/16/20 09:50		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**146**	mg/L	10.0	10		04/14/20 21:10	16887-00-6	
Fluoride	ND	mg/L	0.20	1		04/14/20 20:55	16984-48-8	
Sulfate	**4000**	mg/L	500	500		04/14/20 21:26	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Sample: ASH-04-CCR **Lab ID: 60334143002** Collected: 04/10/20 14:00 Received: 04/11/20 09:10 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**639**	ug/L	100	1	04/23/20 13:50	04/24/20 16:35	7440-42-8	
Calcium	**470000**	ug/L	200	1	04/23/20 13:50	04/24/20 16:35	7440-70-2	
Lithium	**362**	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:35	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-38-2	
Barium	**11.4**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:49	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 14:49	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7439-92-1	
Molybdenum	**1.3**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7439-98-7	
Selenium	**109**	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 14:49	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/01/20 12:10	05/04/20 12:34	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**6100**	mg/L	100	1		04/16/20 09:50		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**197**	mg/L	50.0	50		04/14/20 21:58	16887-00-6	
Fluoride	ND	mg/L	0.20	1		04/14/20 21:42	16984-48-8	
Sulfate	**3330**	mg/L	500	500		04/15/20 15:45	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

QC Batch: 652448
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2646897 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/04/20 12:23	

LABORATORY CONTROL SAMPLE: 2646898

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.4	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2646899 2646900

Parameter	Units	60334152001 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	5	5	4.3	3.9	86	79	75-125	9	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

QC Batch: 650929
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2641332 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	04/24/20 16:10	
Calcium	ug/L	ND	200	04/24/20 16:10	
Lithium	ug/L	ND	10.0	04/24/20 16:10	

LABORATORY CONTROL SAMPLE: 2641333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Lithium	ug/L	1000	950	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2641334 2641335

Parameter	Units	60334063002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	192	1000	1000	1220	1220	103	103	75-125	0	20	
Calcium	ug/L	173000	10000	10000	181000	181000	82	81	75-125	0	20	
Lithium	ug/L	81.3	1000	1000	1040	1040	95	96	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2641336 2641337

Parameter	Units	60334152001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	889	1000	1000	1860	1880	97	99	75-125	1	20	
Calcium	ug/L	359000	10000	10000	361000	365000	20	64	75-125	1	20	M1
Lithium	ug/L	343	1000	1000	1320	1330	98	98	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

QC Batch: 651308
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2642960 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	04/30/20 14:40	
Arsenic	ug/L	ND	1.0	04/30/20 14:40	
Barium	ug/L	ND	1.0	04/30/20 14:40	
Beryllium	ug/L	ND	0.50	04/30/20 14:40	
Cadmium	ug/L	ND	0.50	04/30/20 14:40	
Chromium	ug/L	ND	1.0	04/30/20 14:40	
Cobalt	ug/L	ND	1.0	04/30/20 14:40	
Lead	ug/L	ND	1.0	04/30/20 14:40	
Molybdenum	ug/L	ND	1.0	04/30/20 14:40	
Selenium	ug/L	ND	1.0	04/30/20 14:40	
Thallium	ug/L	ND	1.0	04/30/20 14:40	

LABORATORY CONTROL SAMPLE: 2642961

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.4	101	80-120	
Arsenic	ug/L	40	41.4	104	80-120	
Barium	ug/L	40	38.4	96	80-120	
Beryllium	ug/L	40	40.6	102	80-120	
Cadmium	ug/L	40	40.1	100	80-120	
Chromium	ug/L	40	39.2	98	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.4	101	80-120	
Selenium	ug/L	40	41.7	104	80-120	
Thallium	ug/L	40	37.3	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642962 2642963

Parameter	Units	60334152001 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	40	40	37.5	37.5	94	94	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.2	39.3	98	98	75-125	0	20	
Barium	ug/L	5.1	40	40	43.8	43.7	97	97	75-125	0	20	
Beryllium	ug/L	ND	40	40	30.0	29.3	75	73	75-125	2	20	M1
Cadmium	ug/L	ND	40	40	32.9	32.8	82	82	75-125	0	20	
Chromium	ug/L	ND	40	40	39.0	39.1	97	97	75-125	0	20	

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642962 2642963

Parameter	Units	60334152001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	38.4	38.4	95	95	75-125	0	20	
Lead	ug/L	ND	40	40	32.0	31.8	80	79	75-125	1	20	
Molybdenum	ug/L	1.2	40	40	41.8	41.7	102	101	75-125	0	20	
Selenium	ug/L	ND	40	40	41.4	41.4	103	103	75-125	0	20	
Thallium	ug/L	ND	40	40	31.9	31.8	80	80	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

QC Batch: 649499
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2635895 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	04/16/20 09:48	

LABORATORY CONTROL SAMPLE: 2635896

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	940	94	80-120	

SAMPLE DUPLICATE: 2635897

Parameter	Units	60334170006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1690	1780	5	10	

SAMPLE DUPLICATE: 2635898

Parameter	Units	60334152001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4710	4640	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

QC Batch: 649144
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334143001, 60334143002

METHOD BLANK: 2634592 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/14/20 13:47	
Fluoride	mg/L	ND	0.20	04/14/20 13:47	
Sulfate	mg/L	ND	1.0	04/14/20 13:47	

METHOD BLANK: 2635675 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/16/20 09:10	
Fluoride	mg/L	ND	0.20	04/16/20 09:10	
Sulfate	mg/L	ND	1.0	04/16/20 09:10	

METHOD BLANK: 2637180 Matrix: Water
Associated Lab Samples: 60334143001, 60334143002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/17/20 08:41	
Fluoride	mg/L	ND	0.20	04/17/20 08:41	
Sulfate	mg/L	ND	1.0	04/17/20 08:41	

LABORATORY CONTROL SAMPLE: 2634593

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.4	98	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

LABORATORY CONTROL SAMPLE: 2635676

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	
Fluoride	mg/L	2.5	2.4	96	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

LABORATORY CONTROL SAMPLE: 2637181

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Fluoride	mg/L	2.5	2.4	95	80-120	
Sulfate	mg/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2634594 2634595

Parameter	Units	20149952005 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	97900	50000	50000	150000	150000	105	105	80-120	0	15	
Fluoride	mg/L	ND	250	250	265	299	106	119	80-120	12	15	
Sulfate	mg/L	608	500	500	1150	1360	108	149	80-120	17	15	M1,R1

SAMPLE DUPLICATE: 2634596

Parameter	Units	20149952010 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	87600	87300	0	15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	510	466	9	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

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.

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

M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334143

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334143001	**ASH-07-CCR**	EPA 3010	650929	EPA 6010	651000
60334143002	**ASH-04-CCR**	EPA 3010	650929	EPA 6010	651000
60334143001	**ASH-07-CCR**	EPA 3010	651308	EPA 6020	651454
60334143002	**ASH-04-CCR**	EPA 3010	651308	EPA 6020	651454
60334143001	**ASH-07-CCR**	EPA 7470	652448	EPA 7470	652532
60334143002	**ASH-04-CCR**	EPA 7470	652448	EPA 7470	652532
60334143001	**ASH-07-CCR**	SM 2540C	649499		
60334143002	**ASH-04-CCR**	SM 2540C	649499		
60334143001	**ASH-07-CCR**	EPA 9056	649144		
60334143002	**ASH-04-CCR**	EPA 9056	649144		

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Sample Condition Upon Receipt

WO# : 60334143

60334143

Client Name: Aecom

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1505 8763 7051 Pace Shipping Label Used? Yes ☑ No ☐

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-296 **Type of Ice:** (Wet) Blue None HS

Cooler Temperature (°C): **As-read** 0.3 **Corr. Factor** +0.1 **Corrected** 0.4

Date and initials of person examining contents: 4.11.20

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Date

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-07-CCR	WT	G	4/10/20	1200				3	X		X							X	X	X	X	X		
2	ASH-04-CCR	WT	G	4/10/20	1400				3	X		X							X	X	X	X	X		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

Residual Chlorine (Y/N): U0334143 — Pace Project No./ Lab I.D.

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	AECOM	4/10/20	1630	Pace	4.11.20	0910	0.4	y	y	y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hirshman

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 4/10/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334301
Sampling Event: April 13th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 22, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 13th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an RPD between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60334610</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>9.5 mg/L</td></tr><tr><td colspan="2">60335010</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>25.0 mg/L</td></tr><tr><td>Chromium</td><td>1.0 µg/L</td></tr></table>mg/L – Milligrams per Liter
µg/L – Micrograms Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.

The associated chromium results were reported as non-detect and qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
µg/L – Microgram per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference

Pace Analytical Services, LLC
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May 05, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334301001	**ASH-05-CCR**	Water	04/13/20 10:15	04/14/20 09:30
60334301002	**ASH-08-CCR**	Water	04/13/20 12:35	04/14/20 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334301001	**ASH-05-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	JWR, LDB	3	PASI-K
60334301002	**ASH-08-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	JWR, LDB	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Sample: ASH-05-CCR **Lab ID: 60334301001** Collected: 04/13/20 10:15 Received: 04/14/20 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**817**	ug/L	100	1	04/23/20 13:50	04/24/20 16:56	7440-42-8	
Calcium	**517000**	ug/L	200	1	04/23/20 13:50	04/24/20 16:56	7440-70-2	
Lithium	**288**	ug/L	10.0	1	04/23/20 13:50	04/24/20 16:56	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-38-2	
Barium	**16.9**	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:19	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:19	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7439-98-7	
Selenium	**62.5**	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:19	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/04/20 13:00	05/05/20 11:04	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**4570**	mg/L	100	1		04/16/20 09:51		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**241**	mg/L	50.0	50		04/28/20 11:42	16887-00-6	
Fluoride	ND	mg/L	0.20	1		04/27/20 22:00	16984-48-8	
Sulfate	**2950**	mg/L	500	500		04/27/20 22:16	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Sample: ASH-08-CCR **Lab ID: 60334301002** Collected: 04/13/20 12:35 Received: 04/14/20 09:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**956**	ug/L	100	1	04/23/20 13:50	04/24/20 17:07	7440-42-8	
Calcium	**455000**	ug/L	200	1	04/23/20 13:50	04/24/20 17:07	7440-70-2	
Lithium	**291**	ug/L	10.0	1	04/23/20 13:50	04/24/20 17:07	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-38-2	
Barium	**15.7**	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:24	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	04/30/20 16:24	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-47-3	
Cobalt	**1.4**	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7439-92-1	
Molybdenum	**1.0**	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	04/30/20 16:24	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/04/20 13:00	05/05/20 11:06	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3130**	mg/L	66.7	1		04/16/20 09:51		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**21.2**	mg/L	2.0	2		04/28/20 11:58	16887-00-6	
Fluoride	ND	mg/L	0.20	1		04/27/20 23:04	16984-48-8	
Sulfate	**3070**	mg/L	500	500		04/27/20 23:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

QC Batch: 652570
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2647504 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/05/20 10:48	

LABORATORY CONTROL SAMPLE: 2647505

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.4	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2647506 2647507

Parameter	Units	60334284001 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	5	5	4.8	4.7	96	95	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

QC Batch: 650929
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2641332 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	04/24/20 16:10	
Calcium	ug/L	ND	200	04/24/20 16:10	
Lithium	ug/L	ND	10.0	04/24/20 16:10	

LABORATORY CONTROL SAMPLE: 2641333

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1000	100	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Lithium	ug/L	1000	950	95	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2641334 2641335

Parameter	Units	60334063002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	192	1000	1000	1220	1220	103	103	75-125	0	20	
Calcium	ug/L	173000	10000	10000	181000	181000	82	81	75-125	0	20	
Lithium	ug/L	81.3	1000	1000	1040	1040	95	96	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2641336 2641337

Parameter	Units	60334152001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	889	1000	1000	1860	1880	97	99	75-125	1	20	
Calcium	ug/L	359000	10000	10000	361000	365000	20	64	75-125	1	20	M1
Lithium	ug/L	343	1000	1000	1320	1330	98	98	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

QC Batch: 651308
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2642960 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	04/30/20 14:40	
Arsenic	ug/L	ND	1.0	04/30/20 14:40	
Barium	ug/L	ND	1.0	04/30/20 14:40	
Beryllium	ug/L	ND	0.50	04/30/20 14:40	
Cadmium	ug/L	ND	0.50	04/30/20 14:40	
Chromium	ug/L	ND	1.0	04/30/20 14:40	
Cobalt	ug/L	ND	1.0	04/30/20 14:40	
Lead	ug/L	ND	1.0	04/30/20 14:40	
Molybdenum	ug/L	ND	1.0	04/30/20 14:40	
Selenium	ug/L	ND	1.0	04/30/20 14:40	
Thallium	ug/L	ND	1.0	04/30/20 14:40	

LABORATORY CONTROL SAMPLE: 2642961

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.4	101	80-120	
Arsenic	ug/L	40	41.4	104	80-120	
Barium	ug/L	40	38.4	96	80-120	
Beryllium	ug/L	40	40.6	102	80-120	
Cadmium	ug/L	40	40.1	100	80-120	
Chromium	ug/L	40	39.2	98	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.4	101	80-120	
Selenium	ug/L	40	41.7	104	80-120	
Thallium	ug/L	40	37.3	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642962 2642963

Parameter	Units	60334152001 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	40	40	37.5	37.5	94	94	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.2	39.3	98	98	75-125	0	20	
Barium	ug/L	5.1	40	40	43.8	43.7	97	97	75-125	0	20	
Beryllium	ug/L	ND	40	40	30.0	29.3	75	73	75-125	2	20	M1
Cadmium	ug/L	ND	40	40	32.9	32.8	82	82	75-125	0	20	
Chromium	ug/L	ND	40	40	39.0	39.1	97	97	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642962 2642963

Parameter	Units	60334152001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	38.4	38.4	95	95	75-125	0	20	
Lead	ug/L	ND	40	40	32.0	31.8	80	79	75-125	1	20	
Molybdenum	ug/L	1.2	40	40	41.8	41.7	102	101	75-125	0	20	
Selenium	ug/L	ND	40	40	41.4	41.4	103	103	75-125	0	20	
Thallium	ug/L	ND	40	40	31.9	31.8	80	80	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

QC Batch: 649499
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2635895 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	04/16/20 09:48	

LABORATORY CONTROL SAMPLE: 2635896

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	940	94	80-120	

SAMPLE DUPLICATE: 2635897

Parameter	Units	60334170006 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1690	1780	5	10	

SAMPLE DUPLICATE: 2635898

Parameter	Units	60334152001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4710	4640	1	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

QC Batch: 651331
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334301001, 60334301002

METHOD BLANK: 2643017 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/27/20 07:39	
Fluoride	mg/L	ND	0.20	04/27/20 07:39	
Sulfate	mg/L	ND	1.0	04/27/20 07:39	

METHOD BLANK: 2643623 Matrix: Water
Associated Lab Samples: 60334301001, 60334301002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	04/28/20 07:11	
Fluoride	mg/L	ND	0.20	04/28/20 07:11	
Sulfate	mg/L	ND	1.0	04/28/20 07:11	

LABORATORY CONTROL SAMPLE: 2643018

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.4	87	80-120	
Fluoride	mg/L	2.5	2.2	87	80-120	
Sulfate	mg/L	5	4.6	92	80-120	

LABORATORY CONTROL SAMPLE: 2643624

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.2	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2643019 2643020

Parameter	Units	60334530002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	99.2	50	50	174	159	150	120	80-120	9	15	M1
Fluoride	mg/L	0.24	2.5	2.5	2.6	2.6	94	96	80-120	2	15	
Sulfate	mg/L	54.6	50	50	128	113	148	117	80-120	13	15	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

SAMPLE DUPLICATE: 2643021

Parameter	Units	60334530002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	99.2	113	13	15	
Fluoride	mg/L	0.24	0.24	1	15	
Sulfate	mg/L	54.6	61.5	12	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

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.

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

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

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334301

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334301001	**ASH-05-CCR**	EPA 3010	650929	EPA 6010	651000
60334301002	**ASH-08-CCR**	EPA 3010	650929	EPA 6010	651000
60334301001	**ASH-05-CCR**	EPA 3010	651308	EPA 6020	651454
60334301002	**ASH-08-CCR**	EPA 3010	651308	EPA 6020	651454
60334301001	**ASH-05-CCR**	EPA 7470	652570	EPA 7470	652687
60334301002	**ASH-08-CCR**	EPA 7470	652570	EPA 7470	652687
60334301001	**ASH-05-CCR**	SM 2540C	649499		
60334301002	**ASH-08-CCR**	SM 2540C	649499		
60334301001	**ASH-05-CCR**	EPA 9056	651331		
60334301002	**ASH-08-CCR**	EPA 9056	651331		

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Sample Condition Upon Receipt

WO# : 60334301

60334301

Client Name: AE COM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1505 8703 2114 Pace Shipping Label Used? Yes ☑ No ☐

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-291D **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.7 **Corr. Factor** +0.1 **Corrected** 0.8

Date and initials of person examining contents: 04/19 MK

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot # 1003173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: Jeffrey Shopper Date: _____

F-KS-C-003-Rev.11, February 28, 2018

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A — Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D — Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Y/N	Analysis Test: 9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-05-CCR	WT	G	4/13/20	1015	—			3	X		X							X	X	X	X	X		40334301
2	ASH-08-CCR	WT	G	4/13/20	1235	—			3	X		X							X	X	X	X	X		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	JT AECOM	4/13/20	1630	Harry Fowler / pasi	4/14/20	0930	0.8	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hutchmann

SIGNATURE of SAMPLER: JT

DATE Signed (MM/DD/YY): 4/13/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334388
Sampling Event: April 14th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 14th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>precision is indicated by an RPD between the results of ≤20%.
• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td></td><td></td><td></td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
<table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02-CCR</td><td>DUP-3-CCR</td></tr></table>• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td>X</td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60334610</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>9.5 mg/L</td></tr><tr><td colspan="2">60335010</td></tr><tr><td colspan="2">ERB-2-CCR</td></tr><tr><td>Total Dissolved Solids</td><td>25.0 mg/L</td></tr><tr><td>Chromium</td><td>1.0 µg/L</td></tr></table>mg/L – Milligrams per Liter
µg/L – Micrograms Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.
The associated chromium results were reported as non-detect and qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
µg/L – Microgram per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference

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May 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334388001	**ASH-01-CCR**	Water	04/14/20 10:20	04/15/20 08:30
60334388002	**ASH-02-CCR**	Water	04/14/20 13:30	04/15/20 08:30
60334388003	**DUP-3-CCR**	Water	04/14/20 08:00	04/15/20 08:30

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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334388001	**ASH-01-CCR**	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334388002	**ASH-02-CCR**	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334388003	**DUP-3-CCR**	EPA 6010	HKC, JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Sample: ASH-01-CCR **Lab ID: 60334388001** Collected: 04/14/20 10:20 Received: 04/15/20 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**486**	ug/L	100	1	04/25/20 09:38	04/27/20 15:25	7440-42-8	
Calcium	**381000**	ug/L	200	1	04/25/20 09:38	04/29/20 14:55	7440-70-2	
Lithium	**439**	ug/L	10.0	1	04/25/20 09:38	04/29/20 14:55	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-38-2	
Barium	**9.6**	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:38	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:38	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:38	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 13:53	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3250**	mg/L	66.7	1		04/20/20 13:57		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**23.1**	mg/L	2.0	2		05/05/20 16:14	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	1		05/04/20 09:59	16984-48-8	
Sulfate	**2000**	mg/L	200	200		05/05/20 14:35	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Sample: ASH-02-CCR **Lab ID: 60334388002** Collected: 04/14/20 13:30 Received: 04/15/20 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**1990**	ug/L	100	1	04/25/20 09:38	04/27/20 15:37	7440-42-8	
Calcium	**173000**	ug/L	200	1	04/25/20 09:38	04/29/20 15:07	7440-70-2	
Lithium	**320**	ug/L	10.0	1	04/25/20 09:38	04/29/20 15:07	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-38-2	
Barium	**23.9**	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:59	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 14:59	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7439-92-1	
Molybdenum	**8.4**	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 14:59	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 14:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3430**	mg/L	66.7	1		04/20/20 13:57		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**20.4**	mg/L	5.0	5		05/05/20 01:25	16887-00-6	
Fluoride	ND	mg/L	0.20	1		05/01/20 16:25	16984-48-8	
Sulfate	**2090**	mg/L	200	200		05/05/20 01:42	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Sample: DUP-3-CCR **Lab ID: 60334388003** Collected: 04/14/20 08:00 Received: 04/15/20 08:30 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**1980**	ug/L	100	1	04/25/20 09:38	04/27/20 15:39	7440-42-8	
Calcium	**172000**	ug/L	200	1	04/25/20 09:38	04/29/20 15:09	7440-70-2	
Lithium	**316**	ug/L	10.0	1	04/25/20 09:38	04/29/20 15:09	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-36-0	
Arsenic	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-38-2	
Barium	**22.0**	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-39-3	
Beryllium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 15:04	7440-41-7	
Cadmium	ND	ug/L	0.50	1	04/27/20 14:39	05/05/20 15:04	7440-43-9	
Chromium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-47-3	
Cobalt	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-48-4	
Lead	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7439-92-1	
Molybdenum	**8.4**	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7439-98-7	
Selenium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7782-49-2	
Thallium	ND	ug/L	1.0	1	04/27/20 14:39	05/05/20 15:04	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/06/20 10:15	05/06/20 14:07	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**2910**	mg/L	66.7	1		04/20/20 13:58		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**21.2**	mg/L	2.0	2		05/05/20 02:32	16887-00-6	
Fluoride	ND	mg/L	0.20	1		05/01/20 17:13	16984-48-8	
Sulfate	**2150**	mg/L	200	200		05/05/20 02:48	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 652982
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2648960 Matrix: Water
Associated Lab Samples: 60334388001, 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/06/20 13:37	

LABORATORY CONTROL SAMPLE: 2648961

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2648962 2648963

Parameter	Units	60334388001 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	5	5	5.0	4.9	100	99	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 651247
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2642624 Matrix: Water
Associated Lab Samples: 60334388001, 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	04/27/20 15:14	
Calcium	ug/L	ND	200	04/29/20 14:40	
Lithium	ug/L	ND	10.0	04/29/20 14:40	

LABORATORY CONTROL SAMPLE: 2642625

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	949	95	80-120	
Calcium	ug/L	10000	10800	108	80-120	
Lithium	ug/L	1000	1010	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642626 2642627

Parameter	Units	60334388001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	486	1000	1000	1480	1460	99	97	75-125	1	20	
Calcium	ug/L	381000	10000	10000	389000	386000	72	41	75-125	1	20	M1
Lithium	ug/L	439	1000	1000	1480	1480	104	104	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642628 2642629

Parameter	Units	60334610001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	253	1000	1000	1240	1240	99	98	75-125	0	20	
Calcium	ug/L	86800	10000	10000	97400	98000	106	112	75-125	1	20	
Lithium	ug/L	79.4	1000	1000	1080	1100	100	102	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 651309
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2642964 Matrix: Water
Associated Lab Samples: 60334388001, 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	05/05/20 14:31	
Arsenic	ug/L	ND	1.0	05/05/20 14:31	
Barium	ug/L	ND	1.0	05/05/20 14:31	
Beryllium	ug/L	ND	0.50	05/05/20 14:31	
Cadmium	ug/L	ND	0.50	05/05/20 14:31	
Chromium	ug/L	ND	1.0	05/05/20 14:31	
Cobalt	ug/L	ND	1.0	05/05/20 14:31	
Lead	ug/L	ND	1.0	05/05/20 14:31	
Molybdenum	ug/L	ND	1.0	05/05/20 14:31	
Selenium	ug/L	ND	1.0	05/05/20 14:31	
Thallium	ug/L	ND	1.0	05/05/20 14:31	

LABORATORY CONTROL SAMPLE: 2642965

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.3	101	80-120	
Arsenic	ug/L	40	40.8	102	80-120	
Barium	ug/L	40	38.8	97	80-120	
Beryllium	ug/L	40	41.8	105	80-120	
Cadmium	ug/L	40	39.8	100	80-120	
Chromium	ug/L	40	38.4	96	80-120	
Cobalt	ug/L	40	37.5	94	80-120	
Lead	ug/L	40	38.5	96	80-120	
Molybdenum	ug/L	40	39.3	98	80-120	
Selenium	ug/L	40	41.8	104	80-120	
Thallium	ug/L	40	37.1	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642966 2642967

Parameter	Units	60334388001 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	40	40	38.2	39.1	95	98	75-125	2	20	
Arsenic	ug/L	ND	40	40	40.8	41.6	102	104	75-125	2	20	
Barium	ug/L	9.6	40	40	48.3	49.0	97	99	75-125	2	20	
Beryllium	ug/L	ND	40	40	36.6	37.7	91	94	75-125	3	20	
Cadmium	ug/L	ND	40	40	34.0	34.9	85	87	75-125	3	20	
Chromium	ug/L	ND	40	40	38.8	39.7	96	99	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2642966 2642967

Parameter	Units	60334388001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	36.4	37.4	91	93	75-125	3	20	
Lead	ug/L	ND	40	40	31.7	32.7	79	82	75-125	3	20	
Molybdenum	ug/L	ND	40	40	43.5	45.2	108	112	75-125	4	20	
Selenium	ug/L	ND	40	40	41.8	42.3	104	105	75-125	1	20	
Thallium	ug/L	ND	40	40	31.7	32.5	79	81	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 650182 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388001, 60334388002, 60334388003

METHOD BLANK: 2638424 Matrix: Water
Associated Lab Samples: 60334388001, 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	04/20/20 13:57	

LABORATORY CONTROL SAMPLE: 2638425

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	973	97	80-120	

SAMPLE DUPLICATE: 2638426

Parameter	Units	60334388001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3250	3590	10	10	

SAMPLE DUPLICATE: 2638427

Parameter	Units	60334689003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	689	651	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 652356
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388002, 60334388003

METHOD BLANK: 2646477 Matrix: Water
Associated Lab Samples: 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/01/20 13:30	
Fluoride	mg/L	ND	0.20	05/01/20 13:30	
Sulfate	mg/L	ND	1.0	05/01/20 13:30	

METHOD BLANK: 2647533 Matrix: Water
Associated Lab Samples: 60334388002, 60334388003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/04/20 09:24	
Fluoride	mg/L	ND	0.20	05/04/20 09:24	
Sulfate	mg/L	ND	1.0	05/04/20 09:24	

LABORATORY CONTROL SAMPLE: 2646478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.3	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

LABORATORY CONTROL SAMPLE: 2647534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2646533 2646534

Parameter	Units	40206545002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	17.4	25	25	48.1	40.8	123	93	80-120	16	15	M1,R1
Fluoride	mg/L	<1.0	12.5	12.5	15.8	12.4	119	92	80-120	24	15	R1
Sulfate	mg/L	31.7	25	25	65.5	55.7	135	96	80-120	16	15	M1,R1

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

MATRIX SPIKE SAMPLE: 2646538

Parameter	Units	40206609001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	6.5	5	11.4	97	80-120	
Fluoride	mg/L	0.53	2.5	2.8	91	80-120	
Sulfate	mg/L	162	50	214	105	80-120	E

SAMPLE DUPLICATE: 2646537

Parameter	Units	40206545003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	7.3	7.3	0	15	
Fluoride	mg/L	0.81	0.81	0	15	
Sulfate	mg/L	138	132	4	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

QC Batch: 652553
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334388001

METHOD BLANK: 2647456 Matrix: Water
Associated Lab Samples: 60334388001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/04/20 09:21	
Fluoride	mg/L	ND	0.20	05/04/20 09:21	
Sulfate	mg/L	ND	1.0	05/04/20 09:21	

METHOD BLANK: 2648101 Matrix: Water
Associated Lab Samples: 60334388001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/05/20 09:36	
Fluoride	mg/L	ND	0.20	05/05/20 09:36	
Sulfate	mg/L	ND	1.0	05/05/20 09:36	

LABORATORY CONTROL SAMPLE: 2647457

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	
Fluoride	mg/L	2.5	2.3	94	80-120	
Sulfate	mg/L	5	5.0	99	80-120	

LABORATORY CONTROL SAMPLE: 2648102

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	93	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	4.9	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2647459 2647460

Parameter	Units	60334388001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	23.1	10	10	34.2	33.6	111	104	80-120	2	15	
Fluoride	mg/L	0.24	2.5	2.5	2.4	2.5	86	89	80-120	3	15	
Sulfate	mg/L	2000	1000	1000	3060	3090	107	110	80-120	1	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2647461 2647462

Parameter	Units	60334610001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	116	50	50	169	166	107	101	80-120	2	15	
Fluoride	mg/L	0.57	2.5	2.5	2.8	2.9	91	93	80-120	2	15	
Sulfate	mg/L	320	250	250	569	562	99	97	80-120	1	15	

SAMPLE DUPLICATE: 2647458

Parameter	Units	60334388001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	23.1	23.5	1	15	
Fluoride	mg/L	0.24	.16J		15	
Sulfate	mg/L	2000	2010	1	15	

SAMPLE DUPLICATE: 2647463

Parameter	Units	60334610001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	116	109	6	15	
Fluoride	mg/L	0.57	0.57	0	15	
Sulfate	mg/L	320	305	5	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

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.

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.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334388

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334388001	**ASH-01-CCR**	EPA 3010	651247	EPA 6010	651262
60334388002	**ASH-02-CCR**	EPA 3010	651247	EPA 6010	651262
60334388003	**DUP-3-CCR**	EPA 3010	651247	EPA 6010	651262
60334388001	**ASH-01-CCR**	EPA 3010	651309	EPA 6020	651456
60334388002	**ASH-02-CCR**	EPA 3010	651309	EPA 6020	651456
60334388003	**DUP-3-CCR**	EPA 3010	651309	EPA 6020	651456
60334388001	**ASH-01-CCR**	EPA 7470	652982	EPA 7470	653083
60334388002	**ASH-02-CCR**	EPA 7470	652982	EPA 7470	653083
60334388003	**DUP-3-CCR**	EPA 7470	652982	EPA 7470	653083
60334388001	**ASH-01-CCR**	SM 2540C	650182		
60334388002	**ASH-02-CCR**	SM 2540C	650182		
60334388003	**DUP-3-CCR**	SM 2540C	650182		
60334388001	**ASH-01-CCR**	EPA 9056	652553		
60334388002	**ASH-02-CCR**	EPA 9056	652356		
60334388003	**DUP-3-CCR**	EPA 9056	652356		

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Sample Condition Upon Receipt

WO# : 60334388

60334388

Client Name: AECOM

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 150587636125 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☒ Ziplc

Thermometer Used: T296 Type of Ice: (Wet) Blue None

Cooler Temperature (°C): As-read 4.2 Corr. Factor +0.1 Corrected 4.3

Date and initials of person examining contents: 4-15-2020

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #607173	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks:		
Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A
Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St, Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C
Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-01-CCR	WT	G	4/14/20	1070	—	—		7	X		X						X	X	X	X	X		
2	ASH-02-CCR	WT	G	4/14/20	1330	—	—		3	X		X						X	X	X	X	X		
3	DUP-3-CCR	WT	G	4/14/20	—	—	—		3	X		X						X	X	X	X	X		
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb										
**B, Ca, Li	AECOM	4/14/20	1630	Ipaco	4/15/20	0830	4.3	Y	Y	Y
MS/MSD @ ASH-01										

SAMPLER NAME AND SIGNATURE				
PRINT Name of SAMPLER:	Jeremy Hutchinson			
SIGNATURE of SAMPLER:		DATE Signed (MM/DD/YY):	4/14/20	

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334455
Sampling Event: April 10th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 10th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Detection Limits Mets
(Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.
<table>
<tr><th>Sample</th><th>Analyte</th><th>Result (pCi/L)</th><th>2 Sigma (σ) Uncertainty</th><th>MDC (pCi/L)</th></tr>
<tr><td>ASH-07-CCR</td><td>Ra-226</td><td>0.166</td><td>± 0.253</td><td>0.407</td></tr>
</table>
± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration
Ra – Radium</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – For the radium-226 result for sample ASH-07-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
% – Percent
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
Ra – Radium
RPD – Relative Percent Difference
v – Compound Identification Issue

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 05, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 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 - Greensburg

Revision 1 - This report replaces the May 4, 2020 report. This project was revised on May 4, 2020 to reflect revised Client Sample ID's. (Greensburg, PA)

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

Sincerely,

Heather M. Wilson

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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, LLC
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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334455001	**ASH-07-CCR**	Water	04/10/20 12:00	04/11/20 10:30
60334455002	**ASH-04-CCR**	Water	04/10/20 14:00	04/11/20 10:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334455001	**ASH-07-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334455002	**ASH-04-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Sample: ASH-07-CCR **Lab ID: 60334455001** Collected: 04/10/20 12:00 Received: 04/11/20 10:30 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 903.1	**0.166 ± 0.253 (0.407) C:NA T:94%**	pCi/L	05/01/20 12:07	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.15 ± 0.609 (1.10) C:61% T:80%**	pCi/L	04/29/20 14:14	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.32 ± 0.862 (1.51)**	pCi/L	05/01/20 14:23	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Sample: ASH-04-CCR **Lab ID: 60334455002** Collected: 04/10/20 14:00 Received: 04/11/20 10:30 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 903.1	**0.516 ± 0.383 (0.479) C:NA T:101%**	pCi/L	05/01/20 12:07	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.696 ± 0.494 (0.961) C:71% T:77%**	pCi/L	04/29/20 14:14	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.21 ± 0.877 (1.44)**	pCi/L	05/01/20 14:23	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

QC Batch: 392409
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334455001, 60334455002

METHOD BLANK: 1900036 Matrix: Water
Associated Lab Samples: 60334455001, 60334455002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.713 ± 0.406 (0.750) C:77% T:86%	pCi/L	04/29/20 10:57	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

QC Batch: 392407
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334455001, 60334455002

METHOD BLANK: 1900035 Matrix: Water
Associated Lab Samples: 60334455001, 60334455002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.102 ± 0.375 (0.811) C:NA T:87%	pCi/L	05/01/20 11:30	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334455

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334455001	**ASH-07-CCR**	EPA 903.1	392407		
60334455002	**ASH-04-CCR**	EPA 903.1	392407		
60334455001	**ASH-07-CCR**	EPA 904.0	392409		
60334455002	**ASH-04-CCR**	EPA 904.0	392409		
60334455001	**ASH-07-CCR**	Total Radium Calculation	394616		
60334455002	**ASH-04-CCR**	Total Radium Calculation	394616		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Geoff Webb	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-07-CCR	WT	G	4/10/20	1200				2			X						X	X	X		
2	ASH-04-CC12	WT	G	4/10/20	1400				2			X						X	X	X		
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	TJK AECOM	4/10/20	1630		4-11-20	1030	4.0	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hutchinson

SIGNATURE of SAMPLER: TJK DATE Signed (MM/DD/YY): 4/10/2020

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label
LIMS Login

Tracking #: 1505 8763 6239

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 10 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.3 °C Correction Factor: -0.3 °C Final Temp: ~~0.3~~ 4.0 °C

Temp should be above freezing to 6°C

pH 4-13-20

Comments:	Yes	No	N/A	pH paper Lot# 100391	Date and Initials of person examining contents: DK 4-13-20
Chain of Custody Present:	✓			1.	
Chain of Custody Filled Out:	✓			2.	
Chain of Custody Relinquished:	✓			3.	
Sampler Name & Signature on COC:	✓			4.	
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.	
Samples Arrived within Hold Time:	✓			6.	
Short Hold Time Analysis (<72hr remaining):		✓		7.	
Rush Turn Around Time Requested:		✓		8.	
Sufficient Volume:	✓			9.	
Correct Containers Used: -Pace Containers Used:	✓			10.	
Containers Intact:	✓			11.	
Orthophosphate field filtered			✓	12.	
Hex Cr Aqueous sample field filtered			✓	13.	
Organic Samples checked for dechlorination:			✓	14.	
Filtered volume received for Dissolved tests			✓	15.	
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16.	
All containers meet method preservation requirements.	✓			Initial when completed DK	Date/time of preservation
				Lot # of added preservative	
Headspace in VOA Vials (>6mm):			✓	17.	
Trip Blank Present:		✓		18.	
Trip Blank Custody Seals Present			✓		
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: DK	Date: 4-13-20

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

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Test:	Ra-226
Analyst:	MK1
Date:	4/18/2020
Batch ID:	53500
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1900035
MB concentration:	-0.102
M/B Counting Uncertainty:	0.375
MB MDC:	0.811
MB Numerical Performance Indicator:	-0.53
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53500	LCSD53500
Count Date:	5/1/2020	
Spike I.D.:	18-039	
Spike Concentration (pCi/mL):	31.431	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.659	
Target Conc. (pCi/L, g, F):	4.772	
Uncertainty (Calculated):	0.224	
Result (pCi/L, g, F):	4.439	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.032	
Numerical Performance Indicator:	-0.62	
Percent Recovery:	93.03%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/9/2020	4/9/2020
Sample I.D.	60334185002	60334185006
Sample MS I.D.	60334185009	60334185011
Sample MSD I.D.	60334185010	60334185012
Spike I.D.:	18-039	18-039
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	31.431	31.431
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.662	0.664
MS Target Conc.(pCi/L, g, F):	9.500	9.467
MSD Aliquot (L, g, F):	0.647	0.637
MSD Target Conc. (pCi/L, g, F):	9.722	9.866
MS Spike Uncertainty (calculated):	0.447	0.445
MSD Spike Uncertainty (calculated):	0.457	0.464
Sample Result:	-0.051	0.401
Sample Result Counting Uncertainty (pCi/L, g, F):	0.262	0.393
Sample Matrix Spike Result:	10.769	11.838
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.540	1.635
Sample Matrix Spike Duplicate Result:	9.793	9.038
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.467	1.417
MS Numerical Performance Indicator:	1.591	2.220
MSD Numerical Performance Indicator:	0.152	-1.563
MS Percent Recovery:	113.89%	120.81%
MSD Percent Recovery:	101.25%	87.54%
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:	N/A	N/A
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60334185002	60334185006
Sample MS I.D.	60334185009	60334185011
Sample MSD I.D.	60334185010	60334185012
Sample Matrix Spike Result:	10.769	11.838
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.540	1.635
Sample Matrix Spike Duplicate Result:	9.793	9.038
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.467	1.417
Duplicate Numerical Performance Indicator:	0.900	2.537
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	11.75%	31.93%
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A	N/A
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	32%	32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

5/1/20

5/1/20

Quality Control Sample Performance Assessment

Pace Analytical
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Test:	Ra-228
Analyst:	VAL
Date:	4/21/2020
Worklist:	53501
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1900036
MB concentration:	0.713
M/B 2 Sigma CSU:	0.406
MB MDC:	0.750
MB Numerical Performance Indicator:	3.44
MB Status vs Numerical Indicator:	Fail*
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53501	LCSD53501
Count Date:	4/29/2020	
Spike I.D.:	19-057	
Decay Corrected Spike Concentration (pCi/mL):	34.323	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.802	
Target Conc. (pCi/L, g, F):	4.280	
Uncertainty (Calculated):	0.308	
Result (pCi/L, g, F):	4.885	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.096	
Numerical Performance Indicator:	1.04	
Percent Recovery:	114.13%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/9/2020	4/9/2020
Sample I.D.	60334185002	60334185006
Sample MS I.D.	60334185009	60334185011
Sample MSD I.D.	60334185010	60334185012
Spike I.D.:	19-057	19-057
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.551	34.551
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.810	0.811
MS Target Conc.(pCi/L, g, F):	8.535	8.516
MSD Aliquot (L, g, F):	0.811	0.806
MSD Target Conc. (pCi/L, g, F):	8.524	8.573
MS Spike Uncertainty (calculated):	0.615	0.613
MSD Spike Uncertainty (calculated):	0.614	0.617
Sample Result:	0.701	0.746
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.425	0.432
Sample Matrix Spike Result:	8.391	8.563
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.788	1.802
Sample Matrix Spike Duplicate Result:	8.770	9.611
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.877	1.965
MS Numerical Performance Indicator:	-0.855	-0.702
MSD Numerical Performance Indicator:	-0.441	0.272
MS Percent Recovery:	90.09%	91.78%
MSD Percent Recovery:	94.67%	103.41%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator:	Pass	Pass
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60334185002	60334185006
Sample MS I.D.	60334185009	60334185011
Sample MSD I.D.	60334185010	60334185012
Sample Matrix Spike Result:	8.391	8.563
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.788	1.802
Sample Matrix Spike Duplicate Result:	8.770	9.611
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.877	1.965
Duplicate Numerical Performance Indicator:	-0.287	-0.771
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	4.96%	11.91%
MS/ MSD Duplicate Status vs Numerical Indicator:	Pass	Pass
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	36%	36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*If the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334456
Sampling Event: April 13th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 13th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Detection Limits Mets
(Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.
<table>
<tr><th>Sample</th><th>Analyte</th><th>Result (pCi/L)</th><th>2 Sigma (σ) Uncertainty</th><th>MDC (pCi/L)</th></tr>
<tr><td>ASH-08-CCR</td><td>Ra-226</td><td>0.351</td><td>± 0.431</td><td>0.703</td></tr>
</table>
± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration
Ra – Radium</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – For the radium-226 result for sample ASH-08-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
% – Percent
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
Ra – Radium
RPD – Relative Percent Difference
v – Compound Identification Issue

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 14, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334456001	**ASH-05-CCR**	Water	04/13/20 10:15	04/14/20 09:30
60334456002	**ASH-08-CCR**	Water	04/13/20 12:35	04/14/20 09:30

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334456001	**ASH-05-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334456002	**ASH-08-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

REPORT OF LABORATORY ANALYSIS

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(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Sample: ASH-05-CCR **Lab ID: 60334456001** Collected: 04/13/20 10:15 Received: 04/14/20 09:30 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 903.1	**0.404 ± 0.378 (0.536) C:NA T:96%**	pCi/L	05/05/20 15:40	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.03 ± 0.478 (0.811) C:74% T:84%**	pCi/L	05/01/20 14:02	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.43 ± 0.856 (1.35)**	pCi/L	05/05/20 17:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Sample: ASH-08-CCR **Lab ID: 60334456002** Collected: 04/13/20 12:35 Received: 04/14/20 09:30 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 903.1	**0.351 ± 0.431 (0.703) C:NA T:91%**	pCi/L	05/05/20 15:40	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**3.69 ± 0.923 (0.877) C:76% T:80%**	pCi/L	05/01/20 14:02	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**4.04 ± 1.35 (1.58)**	pCi/L	05/05/20 17:27	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

QC Batch: 392594
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334456001, 60334456002

METHOD BLANK: 1901256
Matrix: Water
Associated Lab Samples: 60334456001, 60334456002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.119 ± 0.382 (0.859) C:77% T:80%	pCi/L	05/01/20 14:03	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

QC Batch: 392952
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334456001, 60334456002

METHOD BLANK: 1903552 Matrix: Water
Associated Lab Samples: 60334456001, 60334456002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.383 (0.775) C:NA T:82%	pCi/L	05/05/20 15:40	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
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QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

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.

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.

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334456

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334456001	**ASH-05-CCR**	EPA 903.1	392952		
60334456002	**ASH-08-CCR**	EPA 903.1	392952		
60334456001	**ASH-05-CCR**	EPA 904.0	392594		
60334456002	**ASH-08-CCR**	EPA 904.0	392594		
60334456001	**ASH-05-CCR**	Total Radium Calculation	394990		
60334456002	**ASH-08-CCR**	Total Radium Calculation	394990		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Geoff Webb	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-05-CCR	WT	G	4/10/10	1015	—	—		2			X						Y	X	X	X		001
2	ASH-08-CCR	WT	G	4/13/10	1235	—	—		2			X						Y	X	X	X		002
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
	[signature] AECOM	4/13/10	1630	Nicole Russo	4/14/2010	930	4.2	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Huntsman

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 4/13/2010

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label

Tracking #: 150587641514

LIMS Login

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 4.6 °C Correction Factor: -0.4 °C Final Temp: 4.2 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4281 Date and initials of person examining contents: NMR 4/15/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:	✓			
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH < 2
All containers meet method preservation requirements.	✓			Initial when completed NMR Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMR Date: 4/15/2020

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Pace Analytical
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Test: Ra-226
Analyst: MK1
Date: 4/23/2020
Batch ID: 53569
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1903552
MB concentration:	0.000
M/B Counting Uncertainty:	0.383
MB MDC:	0.775
MB Numerical Performance Indicator:	0.00
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53569	LCSD53569
Count Date:	5/5/2020	
Spike I.D.:	18-039	
Spike Concentration (pCi/mL):	31.430	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.652	
Target Conc. (pCi/L, g, F):	4.819	
Uncertainty (Calculated):	0.226	
Result (pCi/L, g, F):	4.354	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.010	
Numerical Performance Indicator:	-0.88	
Percent Recovery:	90.36%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/7/2020	
Sample I.D.	30358880001	
Sample MS I.D.	30358880001MS	
Sample MSD I.D.		
Spike I.D.:	18-039	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	31.431	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.651	
MS Target Conc.(pCi/L, g, F):	9.662	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.454	
MSD Spike Uncertainty (calculated):		
Sample Result:	1.939	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.624	
Sample Matrix Spike Result:	9.630	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.313	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:	-2.537	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	79.60%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	N/A	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	136%	
MS/MSD Lower % Recovery Limits:	71%	

Duplicate Sample Assessment		
Sample I.D.:	30359163001	Enter Duplicate
Duplicate Sample I.D.	30359163001DUP	sample IDs if
Sample Result (pCi/L, g, F):	0.471	other than
Sample Result Counting Uncertainty (pCi/L, g, F):	0.400	LCS/LCSD in
Sample Duplicate Result (pCi/L, g, F):	0.299	the space below.
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.415	
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:	0.584	30359163001
Duplicate RPD:	44.57%	30359163001DUP
Duplicate Status vs Numerical Indicator:	N/A	
Duplicate Status vs RPD:	Fail***	
% RPD Limit:	32%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments: results < 5x MDC

~~***Batch must be re-prepped due to unacceptable precision.~~ MF < 2 acceptable

SLC 5-5-2020

JA 5/5/2020

Quality Control Sample Performance Assessment

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Test:	Ra-228
Analyst:	VAL
Date:	4/23/2020
Worklist:	53539
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1901256
MB concentration:	0.119
M/B 2 Sigma CSU:	0.382
MB MDC:	0.859
MB Numerical Performance Indicator:	0.61
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53539	LCSD53539
Count Date:	5/1/2020	
Spike I.D.:	19-057	
Decay Corrected Spike Concentration (pCi/mL):	34.299	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.811	
Target Conc. (pCi/L, g, F):	4.227	
Uncertainty (Calculated):	0.304	
Result (pCi/L, g, F):	3.729	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.948	
Numerical Performance Indicator:	-0.98	
Percent Recovery:	88.20%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/15/2020	
Sample I.D.	30359026001	
Sample MS I.D.	30359026001MS	
Sample MSD I.D.		
Spike I.D.:	19-057	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.483	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.815	
MS Target Conc.(pCi/L, g, F):	8.466	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.610	
MSD Spike Uncertainty (calculated):		
Sample Result:	0.309	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.415	
Sample Matrix Spike Result:	7.874	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.622	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:	-0.992	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	89.35%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	Pass	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	135%	
MS/MSD Lower % Recovery Limits:	60%	

Duplicate Sample Assessment		
Sample I.D.:	30358879001	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	30358879001DUP	
Sample Result (pCi/L, g, F):	0.068	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.325	
Sample Duplicate Result (pCi/L, g, F):	0.441	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	0.355	
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:	-1.518	30358879001
Duplicate RPD:	146.43%	30358879001DUP
Duplicate Status vs Numerical Indicator:	Pass	
Duplicate Status vs RPD:	Fail***	
% RPD Limit:	36%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334603
Sampling Event: April 14th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 14th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. **Analyte** / **Concentration** **MB 1903526** Ra-228 / 0.607 ± 0.492 pCi/L ± – Plus or Minus pCi/L – Picocuries Per Liter MB – Method Blank Ra – Radium		X[1]	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below:	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td><table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02-CCR</td><td>DUP-3-CCR</td></tr></table>
The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.</td><td></td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.</td><td>X</td><td></td><td></td></tr>
<tr><td>Detection Limits Mets (Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.<table><tr><th>Sample</th><th>Analyte</th><th>Result (pCi/L)</th><th>2 Sigma (σ) Uncertainty</th><th>MDC (pCi/L)</th></tr><tr><td>ASH-01-CCR</td><td>Ra-226</td><td>0.238</td><td>± 0.248</td><td>0.350</td></tr></table>± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration
Ra – Radium</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the associated radium-226 sample results were reported at concentrations less than the MDC, qualification was not considered necessary.

2 – For the radium-226 result for sample ASH-01-CCR, the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC and was qualified as estimated (J v) indicating the detection limit criteria was not met.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
% – Percent
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
Ra – Radium
RPD – Relative Percent Difference
v – Compound Identification Issue

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

May 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 15, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334603001	**ASH-01-CCR**	Water	04/14/20 10:20	04/15/20 09:30
60334603002	**ASH-02-CCR**	Water	04/14/20 13:30	04/15/20 09:30
60334603003	**DUP-3-CCR**	Water	04/14/20 08:00	04/15/20 09:30
60334603004	**ASH-01-CCR MS**	Water	04/14/20 10:20	04/15/20 09:30
60334603005	**ASH-01-CCR MSD**	Water	04/14/20 10:20	04/15/20 09:30

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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334603001	**ASH-01-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603002	**ASH-02-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603003	**DUP-3-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334603004	**ASH-01-CCR MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60334603005	**ASH-01-CCR MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Sample: ASH-01-CCR **Lab ID: 60334603001** Collected: 04/14/20 10:20 Received: 04/15/20 09:30 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 903.1	**0.238 ± 0.248 (0.350) C:NA T:92%**	pCi/L	05/06/20 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.743 ± 0.403 (0.735) C:81% T:86%**	pCi/L	05/04/20 11:06	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.981 ± 0.651 (1.09)**	pCi/L	05/06/20 15:18	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Sample: ASH-02-CCR **Lab ID: 60334603002** Collected: 04/14/20 13:30 Received: 04/15/20 09:30 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 903.1	**-0.115 ± 0.318 (0.752) C:NA T:96%**	pCi/L	05/06/20 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.321 ± 0.431 (0.923) C:77% T:80%**	pCi/L	05/04/20 11:06	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.321 ± 0.749 (1.68)**	pCi/L	05/06/20 15:18	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Sample: DUP-3-CCR **Lab ID: 60334603003** Collected: 04/14/20 08:00 Received: 04/15/20 09:30 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 903.1	**0.201 ± 0.348 (0.621) C:NA T:83%**	pCi/L	05/06/20 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.600 ± 0.478 (0.961) C:77% T:78%**	pCi/L	05/04/20 11:23	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.801 ± 0.826 (1.58)**	pCi/L	05/06/20 15:18	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Sample: ASH-01-CCR MS **Lab ID: 60334603004** Collected: 04/14/20 10:20 Received: 04/15/20 09:30 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 903.1	**80.65 %REC ± NA (NA) C:NA T:NA%**	pCi/L	05/06/20 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**86.79 %REC ± NA (NA) C:NA T:NA**	pCi/L	05/04/20 11:06	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Sample: ASH-01-CCR MSD **Lab ID: 60334603005** Collected: 04/14/20 10:20 Received: 04/15/20 09:30 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 903.1	**100.47 %REC 21.89 RPD ± NA (NA) C:NA T:NA%**	pCi/L	05/06/20 14:03	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**67.37 %REC 25.19 RPD ± NA (NA) C:NA T:NA**	pCi/L	05/04/20 11:06	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

QC Batch:	392941	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

METHOD BLANK: 1903525 Matrix: Water

Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.376 (0.760) C:NA T:89%	pCi/L	05/06/20 14:03	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

QC Batch: 392942
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

METHOD BLANK: 1903526
Matrix: Water
Associated Lab Samples: 60334603001, 60334603002, 60334603003, 60334603004, 60334603005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.607 ± 0.298 (0.492) C:82% T:89%	pCi/L	05/04/20 11:05	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334603

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334603001	**ASH-01-CCR**	EPA 903.1	392941		
60334603002	**ASH-02-CCR**	EPA 903.1	392941		
60334603003	**DUP-3-CCR**	EPA 903.1	392941		
60334603004	**ASH-01-CCR MS**	EPA 903.1	392941		
60334603005	**ASH-01-CCR MSD**	EPA 903.1	392941		
60334603001	**ASH-01-CCR**	EPA 904.0	392942		
60334603002	**ASH-02-CCR**	EPA 904.0	392942		
60334603003	**DUP-3-CCR**	EPA 904.0	392942		
60334603004	**ASH-01-CCR MS**	EPA 904.0	392942		
60334603005	**ASH-01-CCR MSD**	EPA 904.0	392942		
60334603001	**ASH-01-CCR**	Total Radium Calculation	395185		
60334603002	**ASH-02-CCR**	Total Radium Calculation	395185		
60334603003	**DUP-3-CCR**	Total Radium Calculation	395185		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Geoff Webb	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-01-CCR	WT	G	4/14/20	1020	—	—		6			X						X	X	X		
2	ASH-02-CCR	WT	G	4/14/20	1330	—	—		3			X						X	X	X		
3	DUP-3-CCR	WT	G	4/14/20	—	—	—		3			X						X	X	X		
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
MS/MSD @ ASH-01	[signature] T Hall AECOM	4/14/20	1630	[signature]	4-15-20	9:30	3.0	X	X	X

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hershman

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 4/14/20

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label
LIMS Login

Tracking #: 1505 8764 1411

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 10 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 3.3 °C Correction Factor: -0.3 °C Final Temp: 3.0 °C

Temp should be above freezing to 6°C

pH paper Lot# 10D4281 Date and initials of person examining contents: DK 4-16-20

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed DK Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: DK Date: 4-16-20

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

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Test:	Ra-226
Analyst:	MK1
Date:	4/23/2020
Batch ID:	53564
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1903525
MB concentration:	0.000
M/B Counting Uncertainty:	0.376
MB MDC:	0.760
MB Numerical Performance Indicator:	0.00
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53564	LCSD53564
Count Date:	5/6/2020	
Spike I.D.:	18-039	
Spike Concentration (pCi/mL):	31.430	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.661	
Target Conc. (pCi/L, g, F):	4.754	
Uncertainty (Calculated):	0.223	
Result (pCi/L, g, F):	4.163	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.897	
Numerical Performance Indicator:	-1.25	
Percent Recovery:	87.58%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/13/2020	4/14/2020
Sample I.D.	35543759002	60334603001
Sample MS I.D.	35543759002MS	60334603004
Sample MSD I.D.		60334603005
Spike I.D.:	18-039	18-039
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	31.431	31.431
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.655	0.648
MS Target Conc.(pCi/L, g, F):	9.597	9.698
MSD Aliquot (L, g, F):		0.651
MSD Target Conc. (pCi/L, g, F):		9.658
MS Spike Uncertainty (calculated):	0.451	0.456
MSD Spike Uncertainty (calculated):		0.454
Sample Result:	0.323	0.238
Sample Result Counting Uncertainty (pCi/L, g, F):	0.271	0.247
Sample Matrix Spike Result:	7.387	8.059
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.123	1.228
Sample Matrix Spike Duplicate Result:		9.942
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		1.347
MS Numerical Performance Indicator:	-4.003	-2.759
MSD Numerical Performance Indicator:		0.062
MS Percent Recovery:	73.61%	80.65%
MSD Percent Recovery:		100.47%
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:		N/A
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60334603001
Sample MS I.D.		60334603004
Sample MSD I.D.		60334603005
Sample Matrix Spike Result:		8.059
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		1.228
Sample Matrix Spike Duplicate Result:		9.942
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		1.347
Duplicate Numerical Performance Indicator:		-2.025
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		21.89%
MS/ MSD Duplicate Status vs Numerical Indicator:		N/A
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

SLC
5-6-2020

Quality Control Sample Performance Assessment

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Test:	Ra-228
Analyst:	VAL
Date:	4/27/2020
Worklist:	53565
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1903526
MB concentration:	0.607
M/B 2 Sigma CSU:	0.298
MB MDC:	0.492
MB Numerical Performance Indicator:	3.99
MB Status vs Numerical Indicator:	Fail*
MB Status vs. MDC:	See Comment*

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS53565	LCSD53565
Count Date:	5/4/2020	
Spike I.D.:	19-057	
Decay Corrected Spike Concentration (pCi/mL):	34.267	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.819	
Target Conc. (pCi/L, g, F):	4.184	
Uncertainty (Calculated):	0.301	
Result (pCi/L, g, F):	3.106	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.772	
Numerical Performance Indicator:	-2.55	
Percent Recovery:	74.23%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	4/13/2020	4/14/2020
Sample I.D.	35543759004	60334603001
Sample MS I.D.	35543759004MS	60334603004
Sample MSD I.D.		60334603005
Spike I.D.:	19-057	19-057
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	34.505	34.505
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.809	0.807
MS Target Conc.(pCi/L, g, F):	8.535	8.554
MSD Aliquot (L, g, F):		0.816
MSD Target Conc. (pCi/L, g, F):		8.453
MS Spike Uncertainty (calculated):	0.615	0.616
MSD Spike Uncertainty (calculated):		0.609
Sample Result:	0.120	0.743
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.295	0.403
Sample Matrix Spike Result:	7.316	8.167
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.509	1.654
Sample Matrix Spike Duplicate Result:		6.438
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.343
MS Numerical Performance Indicator:	-1.585	-1.223
MSD Numerical Performance Indicator:		-3.537
MS Percent Recovery:	84.31%	86.79%
MSD Percent Recovery:		67.37%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator:		Fail****
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60334603001
Sample MS I.D.		60334603004
Sample MSD I.D.		60334603005
Sample Matrix Spike Result:		8.167
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		1.654
Sample Matrix Spike Duplicate Result:		6.438
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.343
Duplicate Numerical Performance Indicator:		1.591
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		25.19%
MS/ MSD Duplicate Status vs Numerical Indicator:		Pass
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:
*The method blank result is below the reporting limit for this analysis and is acceptable.

5/5/20
5/5/20

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334926
Sampling Event: April 20th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤1.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤1.	X		
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Detection Limits Mets (Radiochemistry)	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.	X		
Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
% – Percent
DER – Duplicate Error Ratio
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RPD – Relative Percent Difference

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May 13, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334926001	**ASH-06-CCR**	Water	04/20/20 11:00	04/21/20 09:30
60334926002	**ASH-03-CCR**	Water	04/20/20 13:25	04/21/20 09:30

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334926001	**ASH-06-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60334926002	**ASH-03-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Sample: ASH-06-CCR **Lab ID: 60334926001** Collected: 04/20/20 11:00 Received: 04/21/20 09:30 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 903.1	**0.0661 ± 0.302 (0.613) C:NA T:82%**	pCi/L	05/12/20 11:23	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.415 ± 0.356 (0.715) C:79% T:85%**	pCi/L	05/08/20 11:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.481 ± 0.658 (1.33)**	pCi/L	05/12/20 12:16	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Sample: ASH-03-CCR **Lab ID: 60334926002** Collected: 04/20/20 13:25 Received: 04/21/20 09:30 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 903.1	**0.337 ± 0.440 (0.726) C:NA T:82%**	pCi/L	05/12/20 11:36	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.753 ± 0.376 (0.651) C:80% T:90%**	pCi/L	05/08/20 11:42	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.09 ± 0.816 (1.38)**	pCi/L	05/12/20 12:16	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

QC Batch:	393311	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 60334926001, 60334926002

METHOD BLANK: 1905212 Matrix: Water

Associated Lab Samples: 60334926001, 60334926002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	-0.0341 ± 0.306 (0.729) C:81% T:77%	pCi/L	05/08/20 11:43	

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: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

QC Batch: 393310
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60334926001, 60334926002

METHOD BLANK: 1905211 Matrix: Water
Associated Lab Samples: 60334926001, 60334926002

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.0500 ± 0.325 (0.656) C:NA T:85%	pCi/L	05/12/20 11:23	

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

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334926

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334926001	**ASH-06-CCR**	EPA 903.1	393310		
60334926002	**ASH-03-CCR**	EPA 903.1	393310		
60334926001	**ASH-06-CCR**	EPA 904.0	393311		
60334926002	**ASH-03-CCR**	EPA 904.0	393311		
60334926001	**ASH-06-CCR**	Total Radium Calculation	395929		
60334926002	**ASH-03-CCR**	Total Radium Calculation	395929		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Geoff Webb	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Y/N	Analysis Test: Radium-226	Analysis Test: Radium-228	Analysis Test: Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CCR	WT	G	4/17/20	1100				2			X							X	X	X		
2	ASH-03-CCR	WT	G	4/17/20	1325				2			X							X	X	X		
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Todd Acan	4/20/20	1600		4/21/20	930	4.5	Y	X	Y

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
PRINT Name of SAMPLER:	Jeremy Hershman				
SIGNATURE of SAMPLER:					
DATE Signed (MM/DD/YY):	4/20/20				

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label

Tracking #: 1505 8764 1444

LIMS Login

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used #10 Type of Ice: Wet Blue None

Cooler Temperature Observed Temp 4.8 °C Correction Factor: -0.3 °C Final Temp: 4.5 °C

Temp should be above freezing to 6°C

pH paper Lot# 10041911 Date and Initials of person examining contents: MG 4/21/20

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pHC2
All containers meet method preservation requirements.	✓			Initial when completed: MG Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):		✓		17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: MG Date: 4/21/20

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Test: Ra-226
Analyst: MK1
Date: 4/29/2020
Batch ID: 53646
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1905211
MB concentration:	0.050
M/B Counting Uncertainty:	0.325
MB MDC:	0.656
MB Numerical Performance Indicator:	0.30
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS53646	LCSD53646
Count Date:	5/12/2020	5/12/2020
Spike I.D.:	18-039	18-039
Spike Concentration (pCi/mL):	31.430	31.430
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.655	0.654
Target Conc. (pCi/L, g, F):	4.800	4.809
Uncertainty (Calculated):	0.226	0.226
Result (pCi/L, g, F):	4.144	4.072
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.891	0.894
Numerical Performance Indicator:	-1.40	-1.56
Percent Recovery:	86.33%	84.69%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	73%	73%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Duplicate Sample Assessment		
Sample I.D.:	LCS53646	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD53646	
Sample Result (pCi/L, g, F):	4.144	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.891	
Sample Duplicate Result (pCi/L, g, F):	4.072	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.894	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	0.111	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	1.91%	
Duplicate Status vs Numerical Indicator:	N/A	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	32%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

5-12-20

KLB 5-12-2020

Quality Control Sample Performance Assessment

Pace Analytical™ www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	5/4/2020
Worklist:	53647
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1905212
MB concentration:	-0.034
M/B 2 Sigma CSU:	0.306
MB MDC:	0.729
MB Numerical Performance Indicator:	-0.22
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS53647	LCSD53647
Count Date:	5/8/2020	5/8/2020
Spike I.D.:	19-057	19-057
Decay Corrected Spike Concentration (pCi/mL):	34.221	34.221
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.815	0.811
Target Conc. (pCi/L, g, F):	4.197	4.222
Uncertainty (Calculated):	0.302	0.304
Result (pCi/L, g, F):	2.592	2.731
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.676	0.705
Numerical Performance Indicator:	-4.25	-3.81
Percent Recovery:	61.76%	64.69%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:	LCS53647	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD53647	
Sample Result (pCi/L, g, F):	2.592	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.676	
Sample Duplicate Result (pCi/L, g, F):	2.731	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	0.705	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	-0.280	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	4.64%	
Duplicate Status vs Numerical Indicator:	Pass	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	36%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60334957
Sampling Event: April 20th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: June 23, 2020
Peer Reviewer: Katie Abbott — Date Completed: June 28, 2020

This report contains the final results of the data validation conducted for the water samples collected April 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences (RPD) for the MS/MSD analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>precision is indicated by an RPD between the results of ≤20%.
• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td></td><td></td><td></td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table>
<tr><th>Analyte</th><th>Concentration</th></tr>
<tr><td colspan="2">60334610</td></tr>
<tr><td colspan="2">ERB-2-CCR</td></tr>
<tr><td>Total Dissolved Solids</td><td>9.5 mg/L</td></tr>
<tr><td colspan="2">60335010</td></tr>
<tr><td colspan="2">ERB-2-CCR</td></tr>
<tr><td>Total Dissolved Solids</td><td>25.0 mg/L</td></tr>
<tr><td>Chromium</td><td>1.0 µg/L</td></tr>
</table>
mg/L – Milligrams per Liter
µg/L – Micrograms Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated chromium result for sample ASH-06-CCR was reported at a concentration <5x the concentration of the blank contamination and was qualified as non-detect (U be).
The associated total dissolved solids results were reported at concentrations >5x the concentration of the blank contamination and qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
µg/L – Microgram per Liter
% – Percent
be – Equipment Blank Contamination
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
U – Non-detect

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

May 12, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on April 21, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60334957001	**ASH-06-CCR**	Water	04/20/20 11:00	04/21/20 08:25
60334957002	**ASH-03-CCR**	Water	04/20/20 13:25	04/21/20 08:25

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60334957001	**ASH-06-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60334957002	**ASH-03-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	TDS	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Sample: ASH-06-CCR **Lab ID: 60334957001** Collected: 04/20/20 11:00 Received: 04/21/20 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**308**	ug/L	100	1	04/30/20 14:20	05/01/20 15:03	7440-42-8	
Calcium	**24100**	ug/L	200	1	04/30/20 14:20	05/01/20 15:03	7440-70-2	
Lithium	**60.2**	ug/L	10.0	1	04/30/20 14:20	05/01/20 15:03	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-36-0	
Arsenic	**1.2**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-38-2	
Barium	**58.8**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-39-3	
Beryllium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:48	7440-41-7	
Cadmium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:48	7440-43-9	
Chromium	**2.6**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-47-3	
Cobalt	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-48-4	
Lead	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7439-92-1	
Molybdenum	**15.4**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7439-98-7	
Selenium	**24.5**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7782-49-2	
Thallium	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:48	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/11/20 12:10	05/12/20 09:42	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**443**	mg/L	10.0	1		04/23/20 15:38		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**7.0**	mg/L	1.0	1		05/02/20 01:40	16887-00-6	
Fluoride	**0.69**	mg/L	0.20	1		05/02/20 01:40	16984-48-8	
Sulfate	**63.6**	mg/L	10.0	10		05/02/20 01:56	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Sample: ASH-03-CCR **Lab ID: 60334957002** Collected: 04/20/20 13:25 Received: 04/21/20 08:25 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**807**	ug/L	100	1	04/30/20 14:20	05/01/20 15:05	7440-42-8	
Calcium	**467000**	ug/L	200	1	04/30/20 14:20	05/01/20 15:05	7440-70-2	
Lithium	**428**	ug/L	10.0	1	04/30/20 14:20	05/01/20 15:05	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-36-0	
Arsenic	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-38-2	
Barium	**8.8**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-39-3	
Beryllium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:52	7440-41-7	
Cadmium	ND	ug/L	0.50	1	05/05/20 13:15	05/08/20 11:52	7440-43-9	
Chromium	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-47-3	
Cobalt	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-48-4	
Lead	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7439-98-7	
Selenium	**121**	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7782-49-2	
Thallium	ND	ug/L	1.0	1	05/05/20 13:15	05/08/20 11:52	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	05/11/20 12:10	05/12/20 09:44	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**5760**	mg/L	125	1		04/23/20 15:38		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**76.8**	mg/L	10.0	10		05/02/20 02:43	16887-00-6	
Fluoride	ND	mg/L	0.20	1		05/02/20 02:28	16984-48-8	
Sulfate	**3190**	mg/L	500	500		05/05/20 04:11	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

QC Batch: 653803
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2652699 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	05/12/20 09:26	

LABORATORY CONTROL SAMPLE: 2652700

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.8	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2652701 2652702

Parameter	Units	60334857001 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	5	5	4.4	4.5	87	90	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

QC Batch: 652154
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2645793 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	05/01/20 14:49	
Calcium	ug/L	ND	200	05/01/20 14:49	
Lithium	ug/L	ND	10.0	05/01/20 14:49	

LABORATORY CONTROL SAMPLE: 2645794

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	995	100	80-120	
Calcium	ug/L	10000	10500	105	80-120	
Lithium	ug/L	1000	1030	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2645795 2645796

Parameter	Units	60334760001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	770	1000	1000	1700	1700	93	93	75-125	0	20	
Calcium	ug/L	507000	10000	10000	499000	499000	-76	-72	75-125	0	20	M1
Lithium	ug/L	179	1000	1000	1210	1220	104	104	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

QC Batch: 652835
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2648379 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	05/08/20 11:18	
Arsenic	ug/L	ND	1.0	05/08/20 11:18	
Barium	ug/L	ND	1.0	05/08/20 11:18	
Beryllium	ug/L	ND	0.50	05/08/20 11:18	
Cadmium	ug/L	ND	0.50	05/08/20 11:18	
Chromium	ug/L	ND	1.0	05/08/20 11:18	
Cobalt	ug/L	ND	1.0	05/08/20 11:18	
Lead	ug/L	ND	1.0	05/08/20 11:18	
Molybdenum	ug/L	ND	1.0	05/08/20 11:18	
Selenium	ug/L	ND	1.0	05/08/20 11:18	
Thallium	ug/L	ND	1.0	05/08/20 11:18	

LABORATORY CONTROL SAMPLE: 2648380

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.4	96	80-120	
Arsenic	ug/L	40	39.5	99	80-120	
Barium	ug/L	40	37.6	94	80-120	
Beryllium	ug/L	40	38.6	97	80-120	
Cadmium	ug/L	40	38.1	95	80-120	
Chromium	ug/L	40	38.5	96	80-120	
Cobalt	ug/L	40	38.4	96	80-120	
Lead	ug/L	40	37.5	94	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	38.3	96	80-120	
Thallium	ug/L	40	36.3	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2648381 2648382

Parameter	Units	60334857001 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	40	40	38.0	38.0	95	95	75-125	0	20	
Arsenic	ug/L	ND	40	40	38.7	39.1	96	97	75-125	1	20	
Barium	ug/L	13.1	40	40	50.7	50.6	94	94	75-125	0	20	
Beryllium	ug/L	ND	40	40	32.9	32.4	82	81	75-125	2	20	
Cadmium	ug/L	ND	40	40	34.8	35.2	87	88	75-125	1	20	
Chromium	ug/L	ND	40	40	37.9	37.9	94	94	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2648381 2648382

Parameter	Units	60334857001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	37.1	37.5	90	91	75-125	1	20	
Lead	ug/L	ND	40	40	34.0	34.2	85	85	75-125	1	20	
Molybdenum	ug/L	1.8	40	40	41.8	41.9	100	100	75-125	0	20	
Selenium	ug/L	143	40	40	181	180	94	94	75-125	0	20	
Thallium	ug/L	ND	40	40	33.4	33.7	83	84	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

QC Batch: 650766
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2640735 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	04/23/20 15:36	

LABORATORY CONTROL SAMPLE: 2640736

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2640737

Parameter	Units	60334665002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	754	740	2	10	

SAMPLE DUPLICATE: 2640738

Parameter	Units	60334857003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5230	5740	9	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

QC Batch: 652356
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60334957001, 60334957002

METHOD BLANK: 2646477 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/01/20 13:30	
Fluoride	mg/L	ND	0.20	05/01/20 13:30	
Sulfate	mg/L	ND	1.0	05/01/20 13:30	

METHOD BLANK: 2647533 Matrix: Water
Associated Lab Samples: 60334957001, 60334957002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	05/04/20 09:24	
Fluoride	mg/L	ND	0.20	05/04/20 09:24	
Sulfate	mg/L	ND	1.0	05/04/20 09:24	

LABORATORY CONTROL SAMPLE: 2646478

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.7	94	80-120	
Fluoride	mg/L	2.5	2.3	93	80-120	
Sulfate	mg/L	5	4.8	96	80-120	

LABORATORY CONTROL SAMPLE: 2647534

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.6	92	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	4.9	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2646533 2646534

Parameter	Units	40206545002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	17.4	25	25	48.1	40.8	123	93	80-120	16	15	M1,R1
Fluoride	mg/L	<1.0	12.5	12.5	15.8	12.4	119	92	80-120	24	15	R1
Sulfate	mg/L	31.7	25	25	65.5	55.7	135	96	80-120	16	15	M1,R1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

MATRIX SPIKE SAMPLE: 2646538

Parameter	Units	40206609001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	6.5	5	11.4	97	80-120	
Fluoride	mg/L	0.53	2.5	2.8	91	80-120	
Sulfate	mg/L	162	50	214	105	80-120	E

SAMPLE DUPLICATE: 2646537

Parameter	Units	40206545003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	7.3	7.3	0	15	
Fluoride	mg/L	0.81	0.81	0	15	
Sulfate	mg/L	138	132	4	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

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.

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.
R1	RPD value was outside control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.2 PRPA CCR
Pace Project No.: 60334957

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60334957001	**ASH-06-CCR**	EPA 3010	652154	EPA 6010	652231
60334957002	**ASH-03-CCR**	EPA 3010	652154	EPA 6010	652231
60334957001	**ASH-06-CCR**	EPA 3010	652835	EPA 6020	652871
60334957002	**ASH-03-CCR**	EPA 3010	652835	EPA 6020	652871
60334957001	**ASH-06-CCR**	EPA 7470	653803	EPA 7470	653941
60334957002	**ASH-03-CCR**	EPA 7470	653803	EPA 7470	653941
60334957001	**ASH-06-CCR**	SM 2540C	650766		
60334957002	**ASH-03-CCR**	SM 2540C	650766		
60334957001	**ASH-06-CCR**	EPA 9056	652356		
60334957002	**ASH-03-CCR**	EPA 9056	652356		

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Sample Condition Upon Receipt

WO# : 60334957

60334957

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1505 8763 6581 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T296 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): As-read 0.2 Corr. Factor +0.1 Corrected 0.3

Date and initials of person examining contents: MB 4/21/20

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: Date/Time:

Comments/ Resolution:

Project Manager Review: Date

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — **Required** Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B — **Required** Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Section D — Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CCR	WT	G	4/20/20	1100	—	—		3	X		X							X	X	X	X	X		60334957
2	ASH-03-CCR	WT	G	4/20/20	1325	—	—		3	X		X							X	X	X	X	X		
3																										
4																										
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	JTH AECOM	4/21/20	1600	E Brackett / Pace	4/21/20	0825	0.3	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hardiman

SIGNATURE of SAMPLER: JTH

DATE Signed (MM/DD/YY): 4/21/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

July 2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60342902
Sampling Event: July 15, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: October 5, 2020
Peer Reviewer: Katie Abbott — Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017) and USEPA National Functional Guidelines for Organic Data Review, EPA-540-R-2017-002 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. **Analyte** / **Concentration** **MB 1963995** Total Ra-228 — 0.856 ± 0.394 pCi/L ± – Plus or Minus pCi/L – Picocuries Per Liter MB – Method Blank Ra – Radium		X[1]	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Total vs. Partial Analyses	Comparison of total sample results with the associated partial sample results satisfied the following criteria. • In instances where the sample result is greater than the minimum detectable concentration (MDC) and the value for partial analysis exceed that for a total analysis, the agreement between total sample results and dissolved sample results were evaluated. The DER met the criterion of a DER ≤2.	X		
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.			X
Equipment Blanks	No target analytes reported in the associated equipment blank.	X		
Detection Limits Mets	For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.		X[2]	

Sample	Analyte	Result (pCi/L)	2 Sigma (σ) Uncertainty	MDC (pCi/L)
BAT-05-CDPHE	Total Ra-226	0.466	± 0.541	0.873

± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration
Ra – Radium

Tracer and/or Carrier Recovery	The sample specific recoveries were within the laboratory limits.	X		
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

1 – The associated total radium-228 sample results reported at concentrations greater than the MDC and reported at concentrations less than 5x the concentration of the blank contamination were qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

2 – For the total radium-226 result for sample BAT-05-CDPHE, the 2 sigma (σ) uncertainty multiplied by 1.65 were greater than the reported MDC, and the associated total radium-226 result was qualified as estimated (J v) indicating the detection limit criteria was not met.

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
± – Plus or Minus/High or Low Bias
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
% – Percent
bl – Laboratory blank Contamination
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
Ra – Radium
RPD – Relative Percent Difference
v – Compound Identification Issue

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

August 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 16, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60342902001	**ASH-06-CDPHE**	Water	07/15/20 08:20	07/16/20 09:30
60342902002	**BAT-05-CDPHE**	Water	07/15/20 10:30	07/16/20 09:30
60342902003	**BAT-09-CDPHE**	Water	07/15/20 12:45	07/16/20 09:30
60342902004	**BAT-08-CDPHE**	Water	07/15/20 15:15	07/16/20 09:30
60342902005	**ASH-06-CDPHE DISSOLVED**	Water	07/15/20 08:20	07/16/20 09:30
60342902006	**BAT-05-CDPHE DISSOLVED**	Water	07/15/20 10:30	07/16/20 09:30
60342902007	**BAT-09-CDPHE DISSOLVED**	Water	07/15/20 12:45	07/16/20 09:30
60342902008	**BAT-08-CDPHE DISSOLVED**	Water	07/15/20 15:15	07/16/20 09:30

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SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60342902001	**ASH-06-CDPHE**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	JAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

Sample: ASH-06-CDPHE **Lab ID: 60342902001** Collected: 07/15/20 08:20 Received: 07/16/20 09:30 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 903.1	**0.0586 ± 0.445 (0.880) C:NA T:88%**	pCi/L	07/30/20 12:55	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.939 ± 0.521 (0.948) C:67% T:79%**	pCi/L	07/29/20 14:39	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.998 ± 0.966 (1.83)**	pCi/L	07/31/20 10:01	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

QC Batch: 405819
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

METHOD BLANK: 1963995 Matrix: Water
Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.856 ± 0.394 (0.628) C:69% T:88%	pCi/L	07/29/20 14:36	

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: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

QC Batch: 405818
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

METHOD BLANK: 1963994 Matrix: Water
Associated Lab Samples: 60342902001, 60342902002, 60342902003, 60342902004

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.000 ± 0.313 (0.641) C:NA T:96%	pCi/L	07/30/20 12:36	

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: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CDPHE
Pace Project No.: 60342902

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60342902001	**ASH-06-CDPHE**	EPA 903.1	405818		
60342902001	**ASH-06-CDPHE**	EPA 904.0	405819		
60342902001	**ASH-06-CDPHE**	Total Radium Calculation	407489		

Pace Analytical

Dept: 6003 Customer : 665926 Phone : (317)875-5894 Dept: client services
Date : 01Jul20 Weight : 50 LBS COD : DV :
Shipping : 0.00 Special : 0.00 Handling : 0.00 Total : 0.00
Sync: STANDARD OVERNIGHT Master 1908 6730 3055 TRCK: 1908 6730 3055

Dept: 6003 Customer : 665926 Phone : (317)875-5894 Dept: client services
Date : 01Jul20 Weight : 50 LBS COD : DV :
Shipping : 0.00 Special : 0.00 Handling : 0.00 Total : 0.00
Sync: STANDARD OVERNIGHT Master 1908 6730 3055 TRCK: 1908 6730 3066

Page: of

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	15 Day TAT

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CDPHE
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	73141
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 8

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Total Radium-226	Dissolved Radium-226	Total Radium-228	Dissolved Radium-228	Sum Radium-226 & 228*	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CDPHE	WT	G	—	—	7/15/20	0820		3									✓	✓	✓	✓	✓			
2	BAT-05-CDPHE	WT	G	—	—	7/15/20	1130		3									✓	✓	✓	✓	✓			
3	BAT-09-CDPHE	WT	G	—	—	7/15/20	1145		3									✓	✓	✓	✓	✓			
4	BAT-08-CDPHE	WT	G	—	—	7/15/20	1515		4	2			2					✓	✓	✓	✓	✓			
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*One combined result for the total radium and another for the dissolved radium	Jeff Dabkowski	7/15/20	17:15	Nicole Russo	7/16/20	0930	5.7	Y	Y	Y
							Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dabkowski

SIGNATURE of SAMPLER: Jeff Dabkowski DATE Signed (MM/DD/YY): 07/15/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Tracking #: 190867303066 + 190867303055

Label
LIMS Login

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used 11 Type of Ice: (Wet) Blue None

Cooler Temperature Observed Temp 6.0 °C Correction Factor: -0.3 °C Final Temp: 5.7 °C

Temp should be above freezing to 6°C

pH paper Lot# 1005191 Date and Initials of person examining contents: NMK 7/16/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:	✓			
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16.
All containers meet method preservation requirements.	✓			Initial when completed: NMK Date/time of preservation:
				Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: NMK Date: 7/16/2020

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Pace Analytical
www.paceiabs.com

Test: Ra-226
Analyst: MK1
Date: 7/22/2020
Batch ID: 55143
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1963994
MB concentration:	0.000
M/B Counting Uncertainty:	0.313
MB MDC:	0.641
MB Numerical Performance Indicator:	0.00
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS55143	LCSD55143
Count Date:	7/30/2020	7/30/2020
Spike I.D.:	18-039	18-039
Spike Concentration (pCi/mL):	31.427	31.427
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.661	0.648
Target Conc. (pCi/L, g, F):	4.754	4.850
Uncertainty (Calculated):	0.223	0.228
Result (pCi/L, g, F):	4.953	4.842
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.917	0.958
Numerical Performance Indicator:	0.41	-0.02
Percent Recovery:	104.18%	99.82%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	73%	73%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Duplicate Sample Assessment		
Sample I.D.:	LCS55143	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD55143	
Sample Result (pCi/L, g, F):	4.953	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.917	
Sample Duplicate Result (pCi/L, g, F):	4.842	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.958	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	0.164	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	4.27%	
Duplicate Status vs Numerical Indicator:	N/A	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	32%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

SLC 7-30-2020

7/30/2020

Quality Control Sample Performance Assessment

Pace Analytical™ www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	7/23/2020
Worklist:	55144
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1963995
MB concentration:	0.856
M/B 2 Sigma CSU:	0.394
MB MDC:	0.628
MB Numerical Performance Indicator:	4.25
MB Status vs Numerical Indicator:	Fail*
MB Status vs. MDC:	See Comment*

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS55144	LCSD55144
Count Date:	7/29/2020	7/29/2020
Spike I.D.:	20-030	20-030
Decay Corrected Spike Concentration (pCi/mL):	39.008	39.008
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.817	0.810
Target Conc. (pCi/L, g, F):	4.774	4.816
Uncertainty (Calculated):	0.234	0.236
Result (pCi/L, g, F):	5.087	6.025
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.157	1.363
Numerical Performance Indicator:	0.52	1.71
Percent Recovery:	106.55%	125.09%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	60%	60%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Duplicate Sample Assessment		
Sample I.D.:	LCS55144	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD55144	
Sample Result (pCi/L, g, F):	5.087	
Sample Result 2 Sigma CSU (pCi/L, g, F):	1.157	
Sample Duplicate Result (pCi/L, g, F):	6.025	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	1.363	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	-1.028	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	16.00%	
Duplicate Status vs Numerical Indicator:	Pass	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	36%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:
*The method blank result is below the reporting limit for this analysis and is acceptable.

JV 7-30-20

KB 7-30-2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60343029
Sampling Event: July 16th
Data Reviewer: Brian Rothmeyer — Date Completed: September 24, 2020
Peer Reviewer: Katie Abbott — Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X[1]	
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:	X		

Analyte	MS/MSD (%)	Limits (%)	RPD (%)	Limits (%)
ASH-02-CCR				
Beryllium	**132/131**	75-125	1	20

% – Percent
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
RPD – Relative Percent Difference
Bold indicates a value that is outside of acceptance limits.

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>• When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.
• Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td></td><td></td><td></td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
<table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02-CCR</td><td>DUP-01-CCR</td></tr></table>• When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
• Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td>X</td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60343210</td></tr><tr><td>ERB-02-CCR</td><td></td></tr><tr><td>TDS</td><td>6.0 mg/L</td></tr><tr><td>ERB-03-CCR</td><td></td></tr><tr><td>TDS</td><td>19.5 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td></td><td>X[3]</td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the potential bias was considered to be high for beryllium, and the associated sample result was reported as non-detect, qualification was not considered necessary.

2 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

3 – The beryllium result for sample ASH-07-CCR was reported as non-detect at an elevated reporting limit. This non-detect result will need to be evaluated by the end user of the data with respect to project objectives.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
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August 04, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343029001	**ASH-02-CCR**	Water	07/16/20 09:00	07/17/20 08:40
60343029002	**DUP-01-CCR**	Water	07/16/20 08:00	07/17/20 08:40
60343029003	**ASH-08-CCR**	Water	07/16/20 11:30	07/17/20 08:40
60343029004	**ASH-07-CCR**	Water	07/16/20 13:15	07/17/20 08:40

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343029001	**ASH-02-CCR**	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029002	**DUP-01-CCR**	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029003	**ASH-08-CCR**	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60343029004	**ASH-07-CCR**	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K
		SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Sample: ASH-02-CCR **Lab ID: 60343029001** Collected: 07/16/20 09:00 Received: 07/17/20 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**2040**	ug/L	100	1	07/23/20 11:43	08/03/20 18:02	7440-42-8	
Calcium	**164000**	ug/L	200	1	07/23/20 11:43	08/03/20 18:02	7440-70-2	
Lithium	**314**	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:02	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-38-2	
Barium	**20.0**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:05	7440-41-7	M1
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:05	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-48-4	
Lead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7439-92-1	
Molybdenum	**8.2**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:05	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:37	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3270**	mg/L	66.7	1		07/22/20 08:41		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**21.0**	mg/L	5.0	5		07/24/20 16:00	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	1		07/24/20 14:25	16984-48-8	
Sulfate	**2090**	mg/L	200	200		07/24/20 17:03	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Sample: DUP-01-CCR **Lab ID: 60343029002** Collected: 07/16/20 08:00 Received: 07/17/20 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**2040**	ug/L	100	1	07/23/20 11:43	08/03/20 18:10	7440-42-8	
Calcium	**165000**	ug/L	200	1	07/23/20 11:43	08/03/20 18:10	7440-70-2	
Lithium	**317**	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:10	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-38-2	
Barium	**19.8**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:24	7440-41-7	
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:24	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-48-4	
Lead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7439-92-1	
Molybdenum	**8.1**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:24	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:43	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3110**	mg/L	66.7	1		07/22/20 08:42		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**20.6**	mg/L	5.0	5		07/24/20 18:54	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	1		07/24/20 19:10	16984-48-8	
Sulfate	**2080**	mg/L	200	200		07/24/20 18:06	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Sample: ASH-08-CCR **Lab ID: 60343029003** Collected: 07/16/20 11:30 Received: 07/17/20 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**942**	ug/L	100	1	07/23/20 11:43	08/03/20 18:12	7440-42-8	
Calcium	**432000**	ug/L	200	1	07/23/20 11:43	08/03/20 18:12	7440-70-2	
Lithium	**311**	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:12	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-38-2	
Barium	**14.3**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-39-3	
Beryllium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:29	7440-41-7	
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:29	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-47-3	
Cobalt	**1.5**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-48-4	
Lead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7439-92-1	
Molybdenum	**1.0**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7439-98-7	
Selenium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:29	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:46	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**4520**	mg/L	100	1		07/22/20 08:42		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**20.5**	mg/L	2.0	2		07/28/20 19:36	16887-00-6	
Fluoride	ND	mg/L	0.20	1		07/24/20 19:25	16984-48-8	
Sulfate	**2880**	mg/L	500	500		07/24/20 19:41	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Sample: ASH-07-CCR **Lab ID: 60343029004** Collected: 07/16/20 13:15 Received: 07/17/20 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**742**	ug/L	100	1	07/23/20 11:43	08/03/20 18:15	7440-42-8	
Calcium	**431000**	ug/L	200	1	07/23/20 11:43	08/03/20 18:15	7440-70-2	
Lithium	**589**	ug/L	10.0	1	07/23/20 11:43	08/03/20 18:15	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-36-0	
Arsenic	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-38-2	
Barium	**11.7**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-39-3	
Beryllium	ND	ug/L	1.0	2	07/23/20 09:15	07/30/20 12:56	7440-41-7	1e
Cadmium	ND	ug/L	0.50	1	07/23/20 09:15	07/30/20 12:34	7440-43-9	
Chromium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-47-3	
Cobalt	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-48-4	
Lead	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7439-92-1	
Molybdenum	**1.6**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7439-98-7	
Selenium	**220**	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7782-49-2	
Thallium	ND	ug/L	1.0	1	07/23/20 09:15	07/30/20 12:34	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	07/23/20 08:52	07/23/20 13:48	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**6890**	mg/L	143	1		07/22/20 08:42		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**180**	mg/L	10.0	10		07/24/20 20:13	16887-00-6	
Fluoride	ND	mg/L	0.20	1		07/24/20 19:57	16984-48-8	
Sulfate	**4200**	mg/L	500	500		07/24/20 20:29	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

QC Batch: 667087 | Analysis Method: EPA 7470
QC Batch Method: EPA 7470 | Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701599 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/23/20 12:55	

LABORATORY CONTROL SAMPLE: 2701600

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2701601 2701602

Parameter	Units	60343029001 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	5	5	5.1	5.2	99	100	75-125	2	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

QC Batch: 667142
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701787 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	08/03/20 17:41	
Calcium	ug/L	ND	200	08/03/20 17:41	
Lithium	ug/L	ND	10.0	08/03/20 17:41	

LABORATORY CONTROL SAMPLE: 2701788

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	80-120	
Calcium	ug/L	10000	9790	98	80-120	
Lithium	ug/L	1000	974	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2701789 2701790

Parameter	Units	60343029001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	2040	1000	1000	3020	3080	98	104	75-125	2	20	
Calcium	ug/L	164000	10000	10000	174000	176000	104	125	75-125	1	20	
Lithium	ug/L	314	1000	1000	1350	1360	103	104	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

QC Batch: 667072
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2701556 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	07/30/20 10:54	
Arsenic	ug/L	ND	1.0	07/30/20 10:54	
Barium	ug/L	ND	1.0	07/30/20 10:54	
Beryllium	ug/L	ND	0.50	07/30/20 10:54	
Cadmium	ug/L	ND	0.50	07/30/20 10:54	
Chromium	ug/L	ND	1.0	07/30/20 10:54	
Cobalt	ug/L	ND	1.0	07/30/20 10:54	
Lead	ug/L	ND	1.0	07/30/20 10:54	
Molybdenum	ug/L	ND	1.0	07/30/20 10:54	
Selenium	ug/L	ND	1.0	07/30/20 10:54	
Thallium	ug/L	ND	1.0	07/30/20 10:54	

LABORATORY CONTROL SAMPLE: 2701557

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	40.0	100	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	37.5	94	80-120	
Beryllium	ug/L	40	39.0	98	80-120	
Cadmium	ug/L	40	38.9	97	80-120	
Chromium	ug/L	40	40.9	102	80-120	
Cobalt	ug/L	40	39.6	99	80-120	
Lead	ug/L	40	38.8	97	80-120	
Molybdenum	ug/L	40	40.1	100	80-120	
Selenium	ug/L	40	38.7	97	80-120	
Thallium	ug/L	40	37.2	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2701558 2701559

Parameter	Units	60343029001 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	40	40	39.8	39.7	99	99	75-125	0	20	
Arsenic	ug/L	ND	40	40	42.6	42.3	106	105	75-125	1	20	
Barium	ug/L	20.0	40	40	58.9	58.5	97	96	75-125	1	20	
Beryllium	ug/L	ND	40	40	52.9	52.4	132	131	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	35.4	35.2	88	88	75-125	1	20	
Chromium	ug/L	ND	40	40	31.1	31.2	77	77	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2701558 2701559

Parameter	Units	60343029001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	40.8	40.2	102	100	75-125	2	20	
Lead	ug/L	ND	40	40	32.1	32.3	80	81	75-125	1	20	
Molybdenum	ug/L	8.2	40	40	52.7	52.1	111	110	75-125	1	20	
Selenium	ug/L	ND	40	40	43.5	43.4	108	108	75-125	0	20	
Thallium	ug/L	ND	40	40	32.2	32.4	80	81	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

QC Batch: 666681 | Analysis Method: SM 2540C
QC Batch Method: SM 2540C | Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2700487 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	07/22/20 08:38	

LABORATORY CONTROL SAMPLE: 2700488

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	999	100	80-120	

SAMPLE DUPLICATE: 2700489

Parameter	Units	60343023013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	2060	2180	5	10	

SAMPLE DUPLICATE: 2700490

Parameter	Units	60343029001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3270	3250	0	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

QC Batch: 667260
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

METHOD BLANK: 2702207 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/24/20 09:51	
Fluoride	mg/L	ND	0.20	07/24/20 09:51	
Sulfate	mg/L	ND	1.0	07/24/20 09:51	

METHOD BLANK: 2704372 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/28/20 17:26	
Fluoride	mg/L	ND	0.20	07/28/20 17:26	
Sulfate	mg/L	ND	1.0	07/28/20 17:26	

METHOD BLANK: 2705816 Matrix: Water
Associated Lab Samples: 60343029001, 60343029002, 60343029003, 60343029004

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/29/20 09:09	
Fluoride	mg/L	ND	0.20	07/29/20 09:09	
Sulfate	mg/L	ND	1.0	07/29/20 09:09	

LABORATORY CONTROL SAMPLE: 2702208

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE: 2704373

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.8	95	80-120	
Fluoride	mg/L	2.5	2.7	108	80-120	
Sulfate	mg/L	5	5.1	101	80-120	

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 DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

LABORATORY CONTROL SAMPLE: 2705817

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2702209 2702210

Parameter	Units	60343029001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.0	25	25	46.0	45.9	100	100	80-120	0	15	
Fluoride	mg/L	0.24	2.5	2.5	2.5	2.4	89	88	80-120	1	15	
Sulfate	mg/L	2090	1000	1000	3140	3100	105	101	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2702212 2702213

Parameter	Units	60343210001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	115	50	50	171	171	111	111	80-120	0	15	
Fluoride	mg/L	0.51	2.5	2.5	2.7	2.7	89	89	80-120	0	15	
Sulfate	mg/L	315	250	250	561	558	98	97	80-120	1	15	

SAMPLE DUPLICATE: 2702211

Parameter	Units	60343029001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	21.0	20.6	2	15	
Fluoride	mg/L	0.24	0.24	1	15	
Sulfate	mg/L	2090	2080	1	15	

SAMPLE DUPLICATE: 2702214

Parameter	Units	60343210001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	115	116	0	15	
Fluoride	mg/L	0.51	0.50	2	15	
Sulfate	mg/L	315	310	2	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

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.

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

1e	Dilution was required to get Internal Standard recoveries within Method specifications
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343029

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343029001	**ASH-02-CCR**	EPA 3010	667142	EPA 6010	667237
60343029002	**DUP-01-CCR**	EPA 3010	667142	EPA 6010	667237
60343029003	**ASH-08-CCR**	EPA 3010	667142	EPA 6010	667237
60343029004	**ASH-07-CCR**	EPA 3010	667142	EPA 6010	667237
60343029001	**ASH-02-CCR**	EPA 3010	667072	EPA 6020	667154
60343029002	**DUP-01-CCR**	EPA 3010	667072	EPA 6020	667154
60343029003	**ASH-08-CCR**	EPA 3010	667072	EPA 6020	667154
60343029004	**ASH-07-CCR**	EPA 3010	667072	EPA 6020	667154
60343029001	**ASH-02-CCR**	EPA 7470	667087	EPA 7470	667145
60343029002	**DUP-01-CCR**	EPA 7470	667087	EPA 7470	667145
60343029003	**ASH-08-CCR**	EPA 7470	667087	EPA 7470	667145
60343029004	**ASH-07-CCR**	EPA 7470	667087	EPA 7470	667145
60343029001	**ASH-02-CCR**	SM 2540C	666681		
60343029002	**DUP-01-CCR**	SM 2540C	666681		
60343029003	**ASH-08-CCR**	SM 2540C	666681		
60343029004	**ASH-07-CCR**	SM 2540C	666681		
60343029001	**ASH-02-CCR**	EPA 9056	667260		
60343029002	**DUP-01-CCR**	EPA 9056	667260		
60343029003	**ASH-08-CCR**	EPA 9056	667260		
60343029004	**ASH-07-CCR**	EPA 9056	667260		

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Sample Condition Upon Receipt

WO# : 60343029

60343029

Client Name: Aecom

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 6730 6606, 6591 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): As-read 4.6 / 0.2 Corr. Factor +0.1 Corrected 4.7 / 0.3

Date and initials of person examining contents: 7.17.20 HS

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☑No ☐N/A	Did not receive volume for ASH-06-CCR
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CCR	WT	G	—	—	7/15/20	0820		3	2		1						✓	✓	✓	✓	✓		
2	ASH-02-CCR	WT	G	—	—	7/16/20	0900		7	4		3						✓	✓	✓	✓	✓		MS/MSD @ ASH-02
3	DUP-01-CCR	WT	G	—	—	7/16/20	—		3	2		1						✓	✓	✓	✓	✓		
4	ASH-08-CCR	WT	G	—	—	7/16/20	1130		3	2		1						✓	✓	✓	✓	✓		
5	ASH-07-CCR	WT	G	—	—	7/16/20	1315		3	2		1						✓	✓	✓	✓	✓		
6	~~ASH-06-CCR~~ JD 7/16/20	~~WT~~	~~G~~	—	—	~~7/16/20~~	—		~~3~~	~~2~~		~~1~~						✓	✓	✓	✓	✓		
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dobkowski	7/16/20	1600	Holly Fowler/psi	7/17/20	0840	4.7	Y	Y	Y
**B, Ca, Li							0.3	Y	Y	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski DATE Signed (MM/DD/YY):

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60343165
Sampling Event: July 16th, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: September 25, 2020
Peer Reviewer: Katie Abbott — Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample: ASH-02-CCR — Field Duplicate: DUP-01-CCR	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.</td><td></td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.</td><td>X</td><td></td><td></td></tr>
<tr><td>Detection Limits Mets (Radiochemistry)</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.
<table>
<tr><th>Sample</th><th>Analyte</th><th>Result (pCi/L)</th><th>2 Sigma (σ) Uncertainty</th><th>MDC (pCi/L)</th></tr>
<tr><td>DUP-01-CCR</td><td>Ra-226</td><td>0.377</td><td>± 0.392</td><td>0.584</td></tr>
</table>
± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration
Ra – Radium</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated detected result where the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported minimum detectable concentration (MDC) was qualified as estimated (J v) indicating the detection limit criteria was not met.</td></tr>
</table>

< – Less Than
pCi/L – Picocuries Per Liter
J – Estimated
MDC – Minimum Detectable Concentration
Ra – Radium
≤ – Less Than or Equal To
± – Plus or Minus/High or Low Bias
LCS – Laboratory Control Sample
MS/MSD – Matrix Spike/Matrix Spike Duplicate
v – Compound Identification Issue
σ – Sigma (Uncertainty)
DER – Duplicate Error Ratio
LCSD – Laboratory Control Sample Duplicate
NA – Not Applicable

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

August 07, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 17, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343165001	**ASH-02-CCR**	Water	07/16/20 09:00	07/17/20 10:40
60343165002	**DUP-01-CCR**	Water	07/16/20 08:00	07/17/20 10:40
60343165003	**ASH-08-CCR**	Water	07/16/20 11:30	07/17/20 10:40
60343165004	**ASH-07-CCR**	Water	07/16/20 13:15	07/17/20 10:40
60343165005	**ASH-02-CCR MS**	Water	07/16/20 09:00	07/17/20 10:40
60343165006	**ASH-02-CCR MSD**	Water	07/16/20 09:00	07/17/20 10:40

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SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343165001	**ASH-02-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165002	**DUP-01-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165003	**ASH-08-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165004	**ASH-07-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60343165005	**ASH-02-CCR MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60343165006	**ASH-02-CCR MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: ASH-02-CCR **Lab ID: 60343165001** Collected: 07/16/20 09:00 Received: 07/17/20 10:40 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 903.1	**0.0466 ± 0.330 (0.658) C:NA T:86%**	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.803 ± 0.484 (0.914) C:72% T:87%**	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.850 ± 0.814 (1.57)**	pCi/L	08/04/20 14:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: DUP-01-CCR **Lab ID: 60343165002** Collected: 07/16/20 08:00 Received: 07/17/20 10:40 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 903.1	**0.377 ± 0.392 (0.584) C:NA T:85%**	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.42 ± 0.574 (0.921) C:72% T:81%**	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.80 ± 0.966 (1.51)**	pCi/L	08/04/20 14:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: ASH-08-CCR **Lab ID: 60343165003** Collected: 07/16/20 11:30 Received: 07/17/20 10:40 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 903.1	**0.253 ± 0.359 (0.608) C:NA T:94%**	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.228 ± 0.526 (1.16) C:70% T:77%**	pCi/L	07/31/20 14:11	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.481 ± 0.885 (1.77)**	pCi/L	08/04/20 14:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: ASH-07-CCR **Lab ID: 60343165004** Collected: 07/16/20 13:15 Received: 07/17/20 10:40 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 903.1	**0.256 ± 0.461 (0.813) C:NA T:97%**	pCi/L	08/04/20 11:54	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.0718 ± 0.458 (1.04) C:69% T:81%**	pCi/L	07/31/20 14:10	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.328 ± 0.919 (1.85)**	pCi/L	08/04/20 14:26	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: ASH-02-CCR MS **Lab ID: 60343165005** Collected: 07/16/20 09:00 Received: 07/17/20 10:40 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 903.1	**84.89 %REC ± NA (NA) C:NA T:NA**	pCi/L	08/04/20 12:08	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**94.67 %REC ± NA (NA) C:NA T:NA**	pCi/L	07/31/20 14:11	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Sample: ASH-02-CCR MSD **Lab ID: 60343165006** Collected: 07/16/20 09:00 Received: 07/17/20 10:40 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 903.1	**101.69 %REC 18.01 RPD ± NA (NA) C:NA T:NA**	pCi/L	08/04/20 12:08	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**75.81 %REC 22.13 RPD ± NA (NA) C:NA T:NA**	pCi/L	07/31/20 14:11	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

QC Batch:	406077	Analysis Method:	EPA 903.1
QC Batch Method:	EPA 903.1	Analysis Description:	903.1 Radium-226
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

METHOD BLANK: 1965046 Matrix: Water

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.101 ± 0.342 (0.757) C:NA T:83%	pCi/L	08/04/20 11:40	

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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(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

QC Batch:	406078	Analysis Method:	EPA 904.0
QC Batch Method:	EPA 904.0	Analysis Description:	904.0 Radium 228
		Laboratory:	Pace Analytical Services - Greensburg

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

METHOD BLANK: 1965048 Matrix: Water

Associated Lab Samples: 60343165001, 60343165002, 60343165003, 60343165004, 60343165005, 60343165006

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.372 ± 0.371 (0.767) C:74% T:90%	pCi/L	07/31/20 14:10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

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.

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.

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343165

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343165001	**ASH-02-CCR**	EPA 903.1	406077		
60343165002	**DUP-01-CCR**	EPA 903.1	406077		
60343165003	**ASH-08-CCR**	EPA 903.1	406077		
60343165004	**ASH-07-CCR**	EPA 903.1	406077		
60343165005	**ASH-02-CCR MS**	EPA 903.1	406077		
60343165006	**ASH-02-CCR MSD**	EPA 903.1	406077		
60343165001	**ASH-02-CCR**	EPA 904.0	406078		
60343165002	**DUP-01-CCR**	EPA 904.0	406078		
60343165003	**ASH-08-CCR**	EPA 904.0	406078		
60343165004	**ASH-07-CCR**	EPA 904.0	406078		
60343165005	**ASH-02-CCR MS**	EPA 904.0	406078		
60343165006	**ASH-02-CCR MSD**	EPA 904.0	406078		
60343165001	**ASH-02-CCR**	Total Radium Calculation	407927		
60343165002	**DUP-01-CCR**	Total Radium Calculation	407927		
60343165003	**ASH-08-CCR**	Total Radium Calculation	407927		
60343165004	**ASH-07-CCR**	Total Radium Calculation	407927		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	rev	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes: DRINKING WATER DW; WATER WT; WASTE WATER WW; PRODUCT P; SOIL/SOLID SL; OIL OL; WIPE WP; AIR AR; OTHER OT; TISSUE TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CCR	WT	G	—	—	7/15/20	0820		2			2							✓	✓	✓		
2	ASH-02-CCR	WT	G	—	—	7/16/20	0900		6			6							✓	✓	✓		MS/MSD @ ASH-02
3	DUP-01-CCR	WT	G	—	—	7/16/20	—		2			2							✓	✓	✓		
4	ASH-08-CCR	WT	G	—	—	7/16/20	1130		2			2							✓	✓	✓		
5	ASH-07-CCR	WT	G	—	—	7/16/20	1315		2			2							✓	✓	✓		
6	~~ASH-06-CCR SD 07/16/20~~	~~WT~~	G	—	—	~~7/16/20~~	—		~~2~~			~~2~~							✓	✓	✓		
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jeff Dobkowski	7/16/20	1600	Hyross / Pace	7-17-20	1040	ON/A N ~~N~~ Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski DATE Signed (MM/DD/YY): 7-17-20

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label
LIMS Login

Tracking #: 196867304740

Custody Seal on Cooler/Box Present: ☐ yes ☐ no Seals intact: ☐ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue None

Cooler Temperature Observed Temp °C Correction Factor: °C Final Temp: °C

Temp should be above freezing to 6°C

pH paper Lot# 10D5191 Date and initials of person examining contents: HC 7-17-20

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC:				5.
-Includes date/time/ID Matrix: WT				
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:	✓			
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16.
All containers meet method preservation requirements.	✓			Initial when completed: HC Date/time of preservation: Lot# of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: HC Date: 7-17-20

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution: Missing Sample ASH-06-CCR

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

*PM review is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-226
Analyst:	MK1
Date:	7/25/2020
Batch ID:	55193
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1965046
MB concentration:	-0.101
M/B Counting Uncertainty:	0.342
MB MDC:	0.757
MB Numerical Performance Indicator:	-0.58
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS55193	LCSD55193
Count Date:	8/4/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.186	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.652	
Target Conc. (pCi/L, g, F):	4.935	
Uncertainty (Calculated):	0.232	
Result (pCi/L, g, F):	5.110	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.899	
Numerical Performance Indicator:	0.37	
Percent Recovery:	103.56%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	7/13/2020	7/16/2020
Sample I.D.	35564004001	60343165001
Sample MS I.D.	35564004001MS	60343165005
Sample MSD I.D.		60343165006
Spike I.D.:	20-032	20-032
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.186	32.186
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.642	0.641
MS Target Conc.(pCi/L, g, F):	10.033	10.042
MSD Aliquot (L, g, F):		0.653
MSD Target Conc. (pCi/L, g, F):		9.857
MS Spike Uncertainty (calculated):	0.472	0.472
MSD Spike Uncertainty (calculated):		0.463
Sample Result:	0.226	0.047
Sample Result Counting Uncertainty (pCi/L, g, F):	0.266	0.330
Sample Matrix Spike Result:	10.304	8.571
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.239	1.238
Sample Matrix Spike Duplicate Result:		10.070
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		1.352
MS Numerical Performance Indicator:	0.065	-2.179
MSD Numerical Performance Indicator:		0.222
MS Percent Recovery:	100.45%	84.89%
MSD Percent Recovery:		101.69%
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:		N/A
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60343165001
Sample MS I.D.		60343165005
Sample MSD I.D.		60343165006
Sample Matrix Spike Result:		8.571
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		1.238
Sample Matrix Spike Duplicate Result:		10.070
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		1.352
Duplicate Numerical Performance Indicator:		-1.603
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		18.01%
MS/ MSD Duplicate Status vs Numerical Indicator:		N/A
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

CMT 8/4/2020

Quality Control Sample Performance Assessment

Test: Ra-228
Analyst: VAL
Date: 7/28/2020
Worklist: 55194
Matrix: WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1965048
MB concentration:	0.372
M/B 2 Sigma CSU:	0.371
MB MDC:	0.767
MB Numerical Performance Indicator:	1.96
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS55194	LCSD55194
Count Date:	7/31/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	38.982	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.811	
Target Conc. (pCi/L, g, F):	4.810	
Uncertainty (Calculated):	0.236	
Result (pCi/L, g, F):	4.514	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.160	
Numerical Performance Indicator:	-0.49	
Percent Recovery:	93.85%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	7/13/2020	7/15/2020
Sample I.D.	35564007001	60343165001
Sample MS I.D.	35564007001MS	60343165005
Sample MSD I.D.		60343165006
Spike I.D.:	20-030	20-030
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	39.216	39.216
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.801	0.814
MS Target Conc.(pCi/L, g, F):	9.791	9.634
MSD Aliquot (L, g, F):		0.820
MSD Target Conc. (pCi/L, g, F):		9.562
MS Spike Uncertainty (calculated):	0.480	0.472
MSD Spike Uncertainty (calculated):		0.469
Sample Result:	0.562	0.803
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.463	0.484
Sample Matrix Spike Result:	8.203	9.924
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.682	2.038
Sample Matrix Spike Duplicate Result:		8.052
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.672
MS Numerical Performance Indicator:	-2.329	-0.468
MSD Numerical Performance Indicator:		-2.516
MS Percent Recovery:	78.04%	94.67%
MSD Percent Recovery:		75.81%
MS Status vs Numerical Indicator:	Warning	Pass
MSD Status vs Numerical Indicator:		Warning
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60343165001
Sample MS I.D.		60343165005
Sample MSD I.D.		60343165006
Sample Matrix Spike Result:		9.924
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		2.038
Sample Matrix Spike Duplicate Result:		8.052
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.672
Duplicate Numerical Performance Indicator:		1.392
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		22.13%
MS/ MSD Duplicate Status vs Numerical Indicator:		Pass
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

8/3/2020

8/3/2020

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-226
Analyst:	MK1
Date:	7/27/2020
Batch ID:	55223
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1966408
MB concentration:	0.280
M/B Counting Uncertainty:	0.388
MB MDC:	0.658
MB Numerical Performance Indicator:	1.41
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS55223	LCSD55223
Count Date:	8/3/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.186	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.653	
Target Conc. (pCi/L, g, F):	4.928	
Uncertainty (Calculated):	0.232	
Result (pCi/L, g, F):	5.195	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.015	
Numerical Performance Indicator:	0.50	
Percent Recovery:	105.41%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	7/17/2020	
Sample I.D.	60343289008	
Sample MS I.D.	60343289009	
Sample MSD I.D.	60343289010	
Spike I.D.:	20-032	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.186	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):	0.20	
MS Aliquot (L, g, F):	0.658	
MS Target Conc.(pCi/L, g, F):	9.787	
MSD Aliquot (L, g, F):	0.653	
MSD Target Conc. (pCi/L, g, F):	9.854	
MS Spike Uncertainty (calculated):	0.460	
MSD Spike Uncertainty (calculated):	0.463	
Sample Result:	0.493	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.362	
Sample Matrix Spike Result:	9.191	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.279	
Sample Matrix Spike Duplicate Result:	9.117	
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.207	
MS Numerical Performance Indicator:	-1.517	
MSD Numerical Performance Indicator:	-1.796	
MS Percent Recovery:	88.87%	
MSD Percent Recovery:	87.51%	
MS Status vs Numerical Indicator:	N/A	
MSD Status vs Numerical Indicator:	N/A	
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:	Pass	
MS/MSD Upper % Recovery Limits:	136%	
MS/MSD Lower % Recovery Limits:	71%	

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60343289008	
Sample MS I.D.	60343289009	
Sample MSD I.D.	60343289010	
Sample Matrix Spike Result:	9.191	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.279	
Sample Matrix Spike Duplicate Result:	9.117	
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.207	
Duplicate Numerical Performance Indicator:	0.082	
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	1.54%	
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A	
MS/ MSD Duplicate Status vs RPD:	Pass	
% RPD Limit:	32%	

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

KUB 8-4-2020

SLC 8-3-2020

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	7/28/2020
Worklist:	55226
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	1966413
MB concentration:	0.364
M/B 2 Sigma CSU:	0.347
MB MDC:	0.711
MB Numerical Performance Indicator:	2.06
MB Status vs Numerical Indicator:	Warning
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS55226	LCSD55226
Count Date:	7/30/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	38.996	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.812	
Target Conc. (pCi/L, g, F):	4.805	
Uncertainty (Calculated):	0.235	
Result (pCi/L, g, F):	3.733	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	0.965	
Numerical Performance Indicator:	-2.12	
Percent Recovery:	77.69%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	7/17/2020	
Sample I.D.	60343289008	
Sample MS I.D.	60343289009	
Sample MSD I.D.	60343289010	
Spike I.D.:	20-030	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	39.165	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):	0.20	
MS Aliquot (L, g, F):	0.811	
MS Target Conc.(pCi/L, g, F):	9.662	
MSD Aliquot (L, g, F):	0.814	
MSD Target Conc. (pCi/L, g, F):	9.619	
MS Spike Uncertainty (calculated):	0.473	
MSD Spike Uncertainty (calculated):	0.471	
Sample Result:	1.111	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.502	
Sample Matrix Spike Result:	10.914	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.161	
Sample Matrix Spike Duplicate Result:	10.534	
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.105	
MS Numerical Performance Indicator:	0.123	
MSD Numerical Performance Indicator:	-0.174	
MS Percent Recovery:	101.47%	
MSD Percent Recovery:	97.96%	
MS Status vs Numerical Indicator:	Pass	
MSD Status vs Numerical Indicator:	Pass	
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:	Pass	
MS/MSD Upper % Recovery Limits:	135%	
MS/MSD Lower % Recovery Limits:	60%	

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60343289008	
Sample MS I.D.	60343289009	
Sample MSD I.D.	60343289010	
Sample Matrix Spike Result:	10.914	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.161	
Sample Matrix Spike Duplicate Result:	10.534	
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.105	
Duplicate Numerical Performance Indicator:	0.247	
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	3.52%	
MS/ MSD Duplicate Status vs Numerical Indicator:	Pass	
MS/ MSD Duplicate Status vs RPD:	Pass	
% RPD Limit:	36%	

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

7/31/20

7/31/2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60343460
Sampling Event: July 22nd, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: September 25, 2020
Peer Reviewer: Katie Abbott — Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 22nd, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><th colspan="2">60343210</th></tr><tr><td colspan="2">ERB-02-CCR</td></tr><tr><td>TDS</td><td>6.0 mg/L</td></tr><tr><td colspan="2">ERB-03-CCR</td></tr><tr><td>TDS</td><td>19.5 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

July 30, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 23, 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 - Kansas City

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

Sincerely,

Heather M. Wilson

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343460001	**ASH-06-CCR**	Water	07/22/20 08:30	07/23/20 08:50

Pace Analytical Services, LLC
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Lenexa, KS 66219
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SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343460001	**ASH-06-CCR**	SM 2540C	CNB	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Sample: ASH-06-CCR **Lab ID: 60343460001** Collected: 07/22/20 08:30 Received: 07/23/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	**472**	mg/L	10.0	1		07/28/20 08:58		
9056 IC Anions	Analytical Method: EPA 9056 Pace Analytical Services - Kansas City							
Chloride	**7.9**	mg/L	1.0	1		07/28/20 18:00	16887-00-6	
Fluoride	**0.77**	mg/L	0.20	1		07/28/20 18:00	16984-48-8	
Sulfate	**101**	mg/L	10.0	10		07/28/20 18:15	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

QC Batch: 667823
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343460001

METHOD BLANK: 2704489 Matrix: Water
Associated Lab Samples: 60343460001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	07/28/20 08:57	

LABORATORY CONTROL SAMPLE: 2704490

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2704491

Parameter	Units	60343458003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1350	1420	5	10	

SAMPLE DUPLICATE: 2704492

Parameter	Units	60343460001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	472	481	2	10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

QC Batch: 668101
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343460001

METHOD BLANK: 2705230 Matrix: Water

Associated Lab Samples: 60343460001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/28/20 11:14	
Fluoride	mg/L	ND	0.20	07/28/20 11:14	
Sulfate	mg/L	ND	1.0	07/28/20 11:14	

METHOD BLANK: 2705823 Matrix: Water

Associated Lab Samples: 60343460001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	07/29/20 09:09	
Fluoride	mg/L	ND	0.20	07/29/20 09:09	
Sulfate	mg/L	ND	1.0	07/29/20 09:09	

LABORATORY CONTROL SAMPLE: 2705231

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.5	98	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

LABORATORY CONTROL SAMPLE: 2705824

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705232 2705233

Parameter	Units	20163521001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	88.6	25	25	112	113	95	96	80-120	0	15	E
Fluoride	mg/L	<0.20	2.5	2.5	1.7	1.7	64	63	80-120	2	15	M1
Sulfate	mg/L	2710	25	25	2650	2640	-259	-280	80-120	0	15	E,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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(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

SAMPLE DUPLICATE: 2705234

Parameter	Units	20163521002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	<2.0	ND		15	
Fluoride	mg/L	<0.40	ND		15	
Sulfate	mg/L	21.6	21.3	2	15	

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: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

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.

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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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343460

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343460001	**ASH-06-CCR**	SM 2540C	667823		
60343460001	**ASH-06-CCR**	EPA 9056	668101		

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Sample Condition Upon Receipt

WO# : 60343460

60343460

Client Name: Accom

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 6730 6710 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-299 **Type of Ice:** (Wet) Blue None

HS

Cooler Temperature (°C): As-read 1.2 Corr. Factor +0.1 Corrected 1.3

Date and initials of person examining contents: 7.23.20

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot #	☐Yes ☐No ☑N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☑No ☐N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-06-CCR	WT	G	—	—	7/22/20	0830		2	2								✓					✓		Q0343460
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dobkowski	7/22/20	16:45	NZ pot / Pace	7.23.20	0850	1.3	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski

DATE Signed (MM/DD/YY):

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60343729
Sampling Event: July 24th
Data Reviewer: Brian Rothmeyer — Date Completed: September 25, 2020
Peer Reviewer: Katie Abbott — Date Completed: October 12, 2020

This report contains the final results of the data validation conducted for the water samples collected July 24th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60343210</td></tr><tr><td colspan="2">ERB-02-CCR</td></tr><tr><td>TDS</td><td>6.0 mg/L</td></tr><tr><td colspan="2">ERB-03-CCR</td></tr><tr><td>TDS</td><td>19.5 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><td colspan="5">Comments</td></tr>
<tr><td colspan="5">1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

2 – Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligrams per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
9608 Loiret Blvd.
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August 14, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on July 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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SAMPLE SUMMARY

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60343729001	**ASH-06-CCR**	Water	07/24/20 11:20	07/25/20 08:40

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SAMPLE ANALYTE COUNT

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60343729001	**ASH-06-CCR**	EPA 6010	TDS	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	HKC	1	PASI-K

PASI-K = Pace Analytical Services - Kansas City

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Sample: ASH-06-CCR **Lab ID: 60343729001** Collected: 07/24/20 11:20 Received: 07/25/20 08:40 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Boron	**334**	ug/L	100	1	07/29/20 16:10	08/07/20 13:49	7440-42-8	
Calcium	**37600**	ug/L	200	1	07/29/20 16:10	08/07/20 13:49	7440-70-2	
Lithium	**57.5**	ug/L	10.0	1	07/29/20 16:10	08/07/20 13:49	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-36-0	D3
Arsenic	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-38-2	D3
Barium	**64.7**	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-39-3	
Beryllium	ND	ug/L	2.5	5	07/29/20 10:40	08/14/20 13:17	7440-41-7	D3
Cadmium	ND	ug/L	2.5	5	07/29/20 10:40	08/14/20 13:17	7440-43-9	D3
Chromium	**12.6**	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-47-3	
Cobalt	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-48-4	D3
Lead	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7439-92-1	D3
Molybdenum	**22.4**	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7439-98-7	
Selenium	**25.9**	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7782-49-2	
Thallium	ND	ug/L	5.0	5	07/29/20 10:40	08/14/20 13:17	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	07/27/20 14:16	07/28/20 09:34	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

QC Batch: 667803
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60343729001

METHOD BLANK: 2704434 Matrix: Water
Associated Lab Samples: 60343729001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	07/28/20 09:00	

LABORATORY CONTROL SAMPLE: 2704435

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	99	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2704436 2704437

Parameter	Units	60343718001 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	5	5	4.9	5.0	98	99	75-125	0	20	

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

REPORT OF LABORATORY ANALYSIS

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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

QC Batch: 668354
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343729001

METHOD BLANK: 2705939 Matrix: Water
Associated Lab Samples: 60343729001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	08/07/20 13:11	
Calcium	ug/L	ND	200	08/07/20 13:11	
Lithium	ug/L	ND	10.0	08/07/20 13:11	

LABORATORY CONTROL SAMPLE: 2705940

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1020	102	80-120	
Calcium	ug/L	10000	10000	100	80-120	
Lithium	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705941 2705942

Parameter	Units	60343919001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	127	1000	1000	1160	1160	103	103	75-125	0	20	
Calcium	ug/L	95.8 mg/L	10000	10000	106000	105000	99	91	75-125	1	20	
Lithium	ug/L	33.1	1000	1000	1040	1040	101	100	75-125	0	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

QC Batch: 668255
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60343729001

METHOD BLANK: 2705603 Matrix: Water
Associated Lab Samples: 60343729001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	08/14/20 12:45	
Arsenic	ug/L	ND	1.0	08/14/20 12:45	
Barium	ug/L	ND	1.0	08/14/20 12:45	
Beryllium	ug/L	ND	0.50	08/14/20 12:45	
Cadmium	ug/L	ND	0.50	08/14/20 12:45	
Chromium	ug/L	ND	1.0	08/14/20 12:45	
Cobalt	ug/L	ND	1.0	08/14/20 12:45	
Lead	ug/L	ND	1.0	08/14/20 12:45	
Molybdenum	ug/L	ND	1.0	08/14/20 12:45	
Selenium	ug/L	ND	1.0	08/14/20 12:45	
Thallium	ug/L	ND	1.0	08/14/20 12:45	

LABORATORY CONTROL SAMPLE: 2705604

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	39.4	98	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	38.6	97	80-120	
Beryllium	ug/L	40	38.8	97	80-120	
Cadmium	ug/L	40	38.7	97	80-120	
Chromium	ug/L	40	41.4	103	80-120	
Cobalt	ug/L	40	40.5	101	80-120	
Lead	ug/L	40	39.0	98	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	38.2	96	80-120	
Thallium	ug/L	40	37.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705605 2705606

Parameter	Units	60343718001 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	40	40	40.4	41.1	100	102	75-125	2	20	
Arsenic	ug/L	ND	40	40	42.4	43.0	105	107	75-125	1	20	
Barium	ug/L	19.0	40	40	57.5	58.6	96	99	75-125	2	20	
Beryllium	ug/L	ND	40	40	38.3	38.7	95	97	75-125	1	20	
Cadmium	ug/L	ND	40	40	39.0	39.5	97	99	75-125	1	20	
Chromium	ug/L	ND	40	40	44.1	45.1	109	112	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2705605 2705606

Parameter	Units	60343718001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	42.1	42.9	104	106	75-125	2	20	
Lead	ug/L	ND	40	40	35.4	36.0	88	90	75-125	2	20	
Molybdenum	ug/L	ND	40	40	45.7	47.1	105	108	75-125	3	20	
Selenium	ug/L	ND	40	40	39.4	40.1	97	99	75-125	2	20	
Thallium	ug/L	ND	40	40	35.0	35.9	87	89	75-125	2	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

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.

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

D3 Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630004.200.2 PRPA CCR
Pace Project No.: 60343729

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60343729001	**ASH-06-CCR**	EPA 3010	668354	EPA 6010	668488
60343729001	**ASH-06-CCR**	EPA 3010	668255	EPA 6020	668322
60343729001	**ASH-06-CCR**	EPA 7470	667803	EPA 7470	667891

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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60343729

60343729

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 1073 1 2597 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 3.5 **Corr. Factor** -0.5 **Corrected** 3.0

Date and initials of person examining contents: 05/25/20 MK

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot# 003173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1142	Start:
End: 1145	End:
Temp: 3.0	Temp:

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

NPDES GROUND WATER DRINKING WATER
UST RCRA OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N: 9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	GASH-06-CCR	WT	G	—	—	7/24/20	1120		1			1							✓	✓	✓			60343729
2																								limited volume
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dabkowski	7/24/20	1300	Mueller/Pace	7/25/20	0810	5.0	X	Y	X
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dabkowski

SIGNATURE of SAMPLER: Jeff Dabkowski

DATE Signed (MM/DD/YY): 7/24/20

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.08, 12-Oct-2007

October 2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60350434
Sampling Event: October 5, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 20, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 5th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_X_ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60350963</td></tr><tr><td colspan="2">ERB-04-CCR</td></tr><tr><td>TDS</td><td>12.0 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligram per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

October 29, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 06, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60350434001	**ASH-01-CCR**	Water	10/05/20 09:15	10/06/20 08:45

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350434001	**ASH-01-CCR**	EPA 6010	JLH	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Sample: ASH-01-CCR **Lab ID: 60350434001** Collected: 10/05/20 09:15 Received: 10/06/20 08:45 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**487**	ug/L	100	1	10/20/20 16:50	10/23/20 15:49	7440-42-8	
Calcium	**329000**	ug/L	200	1	10/20/20 16:50	10/23/20 15:49	7440-70-2	
Lithium	**413**	ug/L	10.0	1	10/20/20 16:50	10/23/20 15:49	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-36-0	
Arsenic	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-38-2	
Barium	**9.3**	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-39-3	
Beryllium	ND	ug/L	0.50	1	10/27/20 10:35	10/29/20 10:03	7440-41-7	
Cadmium	ND	ug/L	0.50	1	10/27/20 10:35	10/29/20 10:03	7440-43-9	
Chromium	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-47-3	
Cobalt	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-48-4	
Lead	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7439-92-1	
Molybdenum	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7439-98-7	
Selenium	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7782-49-2	
Thallium	ND	ug/L	1.0	1	10/27/20 10:35	10/29/20 10:03	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/13/20 16:51	10/14/20 13:22	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3330**	mg/L	66.7	1		10/07/20 13:40		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**23.0**	mg/L	2.0	2		10/26/20 11:52	16887-00-6	
Fluoride	**0.24**	mg/L	0.20	1		10/26/20 11:36	16984-48-8	
Sulfate	**2100**	mg/L	200	200		10/26/20 12:08	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

QC Batch: 682487
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350434001

METHOD BLANK: 2758831 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/14/20 13:15	

LABORATORY CONTROL SAMPLE: 2758832

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2758833 2758834

Parameter	Units	60350840001 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	5	5	5.0	5.0	99	99	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

QC Batch: 684016
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2765272 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	10/23/20 15:33	
Calcium	ug/L	ND	200	10/23/20 15:33	
Lithium	ug/L	ND	10.0	10/23/20 15:33	

LABORATORY CONTROL SAMPLE: 2765273

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	500	473	95	80-120	
Calcium	ug/L	5000	4560	91	80-120	
Lithium	ug/L	500	498	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2765274 2765275

Parameter	Units	60350205001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	564	500	500	1020	1040	92	95	75-125	1	20	
Calcium	ug/L	98200	5000	5000	96600	98700	-32	10	75-125	2	20	M1
Lithium	ug/L	41.6	500	500	536	548	99	101	75-125	2	20	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

QC Batch: 685294
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60350434001

METHOD BLANK: 2770426 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	10/29/20 09:44	
Arsenic	ug/L	ND	1.0	10/29/20 09:44	
Barium	ug/L	ND	1.0	10/29/20 09:44	
Beryllium	ug/L	ND	0.50	10/29/20 09:44	
Cadmium	ug/L	ND	0.50	10/29/20 09:44	
Chromium	ug/L	ND	1.0	10/29/20 09:44	
Cobalt	ug/L	ND	1.0	10/29/20 09:44	
Lead	ug/L	ND	1.0	10/29/20 09:44	
Molybdenum	ug/L	ND	1.0	10/29/20 09:44	
Selenium	ug/L	ND	1.0	10/29/20 09:44	
Thallium	ug/L	ND	1.0	10/29/20 09:44	

LABORATORY CONTROL SAMPLE: 2770427

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.8	97	80-120	
Arsenic	ug/L	40	39.9	100	80-120	
Barium	ug/L	40	37.0	93	80-120	
Beryllium	ug/L	40	40.7	102	80-120	
Cadmium	ug/L	40	39.0	98	80-120	
Chromium	ug/L	40	40.4	101	80-120	
Cobalt	ug/L	40	39.1	98	80-120	
Lead	ug/L	40	39.3	98	80-120	
Molybdenum	ug/L	40	39.1	98	80-120	
Selenium	ug/L	40	38.7	97	80-120	
Thallium	ug/L	40	37.7	94	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2770428 2770429

Parameter	Units	60350369001 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	40	40	37.7	37.3	94	93	75-125	1	20	
Arsenic	ug/L	ND	40	40	42.4	41.6	106	104	75-125	2	20	
Barium	ug/L	9.3	40	40	49.3	48.4	100	98	75-125	2	20	
Beryllium	ug/L	ND	40	40	38.4	38.1	96	95	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.4	34.9	88	87	75-125	1	20	
Chromium	ug/L	ND	40	40	46.5	45.8	115	114	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2770428 2770429

Parameter	Units	60350369001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	40.5	39.9	101	100	75-125	1	20	
Lead	ug/L	ND	40	40	31.6	30.7	79	77	75-125	3	20	
Molybdenum	ug/L	ND	40	40	50.6	49.9	126	124	75-125	2	20	M1
Selenium	ug/L	ND	40	40	42.2	41.5	105	103	75-125	2	20	
Thallium	ug/L	ND	40	40	32.3	31.6	81	79	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

QC Batch: 681356
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350434001

METHOD BLANK: 2753988 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	10/07/20 13:38	

LABORATORY CONTROL SAMPLE: 2753989

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	989	99	80-120	

SAMPLE DUPLICATE: 2753990

Parameter	Units	60350088001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	1650	1590	4	10	

SAMPLE DUPLICATE: 2753991

Parameter	Units	60350395001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	9280	8920	4	10	

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 DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

QC Batch: 685060
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350434001

METHOD BLANK: 2769666 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/26/20 09:13	
Fluoride	mg/L	ND	0.20	10/26/20 09:13	
Sulfate	mg/L	ND	1.0	10/26/20 09:13	

METHOD BLANK: 2770399 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/27/20 09:06	
Fluoride	mg/L	ND	0.20	10/27/20 09:06	
Sulfate	mg/L	ND	1.0	10/27/20 09:06	

METHOD BLANK: 2771511 Matrix: Water
Associated Lab Samples: 60350434001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	104	80-120	

LABORATORY CONTROL SAMPLE: 2770400

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

LABORATORY CONTROL SAMPLE: 2771512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Fluoride	mg/L	2.5	2.6	102	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769668 2769669

Parameter	Units	60350879002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769671 2769672

Parameter	Units	60350879003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.0	10	10	31.9	32.7	109	117	80-120	2	15	
Fluoride	mg/L	0.22	2.5	2.5	2.1	2.1	77	75	80-120	2	15	M1
Sulfate	mg/L	2610	2500	2500	5210	5260	104	106	80-120	1	15	M1

SAMPLE DUPLICATE: 2769670

Parameter	Units	60350879002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	126	122	4	15	
Fluoride	mg/L	0.64	0.64	1	15	
Sulfate	mg/L	323	310	4	15	

SAMPLE DUPLICATE: 2769673

Parameter	Units	60350879003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	21.0	21.0	0	15	
Fluoride	mg/L	0.22	ND		15	
Sulfate	mg/L	2610	2740	5	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

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.

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

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

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350434

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350434001	**ASH-01-CCR**	EPA 3010	684016	EPA 6010	684144
60350434001	**ASH-01-CCR**	EPA 3010	685294	EPA 6020	685326
60350434001	**ASH-01-CCR**	EPA 7470	682487	EPA 7470	682636
60350434001	**ASH-01-CCR**	SM 2540C	681356		
60350434001	**ASH-01-CCR**	EPA 9056	685060		

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Sample Condition Upon Receipt

WO# : 60350434

60350434

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 6736 0923 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.4 **Corr. Factor** +0.2 **Corrected** 0.6

Date and initials of person examining contents: DM 10/6/20

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER _____

Site Location STATE: CO

Section D — Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COMPOSITE START TIME	COMPOSITE END/GRAB DATE	COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N)	9056 Cl, F, SO_4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS							Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-01-[redacted] CCR		G	10/5/20	9:15	—	—		3	2		1						✓	✓	✓	✓	✓	BPJU	BPJN						BPJU 60350434 001
2																														
3																														
4																														
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dobkowski	10/5/2020	15:50	[signature]	10.6.20	0845	0.6	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/05/2020

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60350963
Sampling Event: October 9, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 20, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 9th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_X_ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
<table><tr><th>Parent Sample</th><th>Field Duplicate</th></tr><tr><td>ASH-02-CCR</td><td>DUP-04</td></tr></table>
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td>X</td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60350963</td></tr><tr><td>ERB-04-CCR</td><td></td></tr><tr><td>TDS</td><td>12.0 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><td colspan="5">Comments</td></tr>
<tr><td colspan="5">1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
mg/L – Milligram per Liter
% – Percent
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 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 - Kansas City

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

Sincerely,

Heather M. Wilson

Heather Wilson
heather.wilson@pacelabs.com
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Project Manager

Enclosures

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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60350963001	**ASH-02-CCR**	Water	10/09/20 08:30	10/10/20 08:50
60350963002	**DUP-04**	Water	10/09/20 00:00	10/10/20 08:50
60350963003	**ASH-05-CCR**	Water	10/09/20 11:00	10/10/20 08:50
60350963005	**ERB-04**	Water	10/09/20 12:45	10/10/20 08:50

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350963001	**ASH-02-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963002	**DUP-04**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963003	**ASH-05-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K
60350963005	**ERB-04**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Sample: ASH-02-CCR **Lab ID: 60350963001** Collected: 10/09/20 08:30 Received: 10/10/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**2140**	ug/L	100	1	11/01/20 18:06	11/02/20 12:11	7440-42-8	
Calcium	**176000**	ug/L	200	1	11/01/20 18:06	11/02/20 12:11	7440-70-2	
Lithium	**303**	ug/L	10.0	1	11/01/20 18:06	11/02/20 12:11	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-38-2	D3
Barium	**19.0**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:15	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:15	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-47-3	D3
Cobalt	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7439-92-1	D3
Molybdenum	**8.5**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7439-98-7	
Selenium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7782-49-2	D3
Thallium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:15	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:30	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3350**	mg/L	66.7	1		10/14/20 15:29		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**20.4**	mg/L	5.0	5		10/27/20 12:33	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	1		10/27/20 12:18	16984-48-8	
Sulfate	**1050**	mg/L	200	200		10/27/20 12:47	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Sample: DUP-04 **Lab ID: 60350963002** Collected: 10/09/20 00:00 Received: 10/10/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**2100**	ug/L	100	1	11/01/20 18:06	11/02/20 12:14	7440-42-8	
Calcium	**172000**	ug/L	200	1	11/01/20 18:06	11/02/20 12:14	7440-70-2	
Lithium	**302**	ug/L	10.0	1	11/01/20 18:06	11/02/20 12:14	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-38-2	D3
Barium	**17.2**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:20	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:20	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-47-3	D3
Cobalt	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7439-92-1	D3
Molybdenum	**8.4**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7439-98-7	
Selenium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7782-49-2	D3
Thallium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:20	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:33	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**3270**	mg/L	66.7	1		10/14/20 15:29		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**21.4**	mg/L	2.0	2		10/27/20 13:17	16887-00-6	
Fluoride	**0.23**	mg/L	0.20	1		10/27/20 13:02	16984-48-8	
Sulfate	**1090**	mg/L	200	200		10/27/20 13:32	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Sample: ASH-05-CCR **Lab ID: 60350963003** Collected: 10/09/20 11:00 Received: 10/10/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**884**	ug/L	100	1	11/01/20 18:06	11/02/20 12:17	7440-42-8	
Calcium	**557000**	ug/L	200	1	11/01/20 18:06	11/02/20 12:17	7440-70-2	
Lithium	**313**	ug/L	10.0	1	11/01/20 18:06	11/02/20 12:17	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-38-2	D3
Barium	**15.4**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:24	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:24	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-47-3	D3
Cobalt	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7439-98-7	D3
Selenium	**57.8**	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:24	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:35	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**4810**	mg/L	100	1		10/14/20 15:29		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**242**	mg/L	50.0	50		10/27/20 14:31	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/27/20 13:47	16984-48-8	
Sulfate	**2710**	mg/L	500	500		10/27/20 14:46	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Sample: ERB-04 **Lab ID: 60350963005** Collected: 10/09/20 12:45 Received: 10/10/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Boron	ND	ug/L	100	1	11/01/20 18:06	11/02/20 12:22	7440-42-8	
Calcium	ND	ug/L	200	1	11/01/20 18:06	11/02/20 12:22	7440-70-2	
Lithium	ND	ug/L	10.0	1	11/01/20 18:06	11/02/20 12:22	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-38-2	D3
Barium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-39-3	D3
Beryllium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:33	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/01/20 18:06	11/04/20 14:33	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-47-3	D3
Cobalt	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7439-98-7	D3
Selenium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7782-49-2	D3
Thallium	ND	ug/L	3.0	3	11/01/20 18:06	11/04/20 14:33	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:39	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	**12.0**	mg/L	5.0	1		10/14/20 15:30		
9056 IC Anions	Analytical Method: EPA 9056 Pace Analytical Services - Kansas City							
Chloride	ND	mg/L	1.0	1		10/27/20 15:31	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/27/20 15:31	16984-48-8	
Sulfate	ND	mg/L	1.0	1		10/27/20 15:31	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

QC Batch: 682721
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2759679 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/15/20 12:01	

LABORATORY CONTROL SAMPLE: 2759680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2759681 2759682

Parameter	Units	60350879003 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	5	5	4.9	4.6	96	92	75-125	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

QC Batch: 686333
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2774094 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	11/02/20 11:41	
Calcium	ug/L	ND	200	11/02/20 11:41	
Lithium	ug/L	ND	10.0	11/02/20 11:41	

LABORATORY CONTROL SAMPLE: 2774095

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	1010	101	80-120	
Calcium	ug/L	10000	10200	102	80-120	
Lithium	ug/L	1000	1040	104	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2774096 2774097

Parameter	Units	60350962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1990	1000	1000	3090	3080	110	110	75-125	0	20	
Calcium	ug/L	164000	10000	10000	182000	180000	184	163	75-125	1	20	M1
Lithium	ug/L	279	1000	1000	1230	1240	95	96	75-125	1	20	

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

QC Batch: 686335
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2774102 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/04/20 13:25	
Arsenic	ug/L	ND	1.0	11/04/20 13:25	
Barium	ug/L	ND	1.0	11/04/20 13:25	
Beryllium	ug/L	ND	0.50	11/04/20 13:25	
Cadmium	ug/L	ND	0.50	11/04/20 13:25	
Chromium	ug/L	ND	1.0	11/04/20 13:25	
Cobalt	ug/L	ND	1.0	11/04/20 13:25	
Lead	ug/L	ND	1.0	11/04/20 13:25	
Molybdenum	ug/L	ND	1.0	11/04/20 13:25	
Selenium	ug/L	ND	1.0	11/04/20 13:25	
Thallium	ug/L	ND	1.0	11/04/20 13:25	

LABORATORY CONTROL SAMPLE: 2774103

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.0	95	80-120	
Arsenic	ug/L	40	38.5	96	80-120	
Barium	ug/L	40	36.9	92	80-120	
Beryllium	ug/L	40	38.5	96	80-120	
Cadmium	ug/L	40	37.6	94	80-120	
Chromium	ug/L	40	38.3	96	80-120	
Cobalt	ug/L	40	38.8	97	80-120	
Lead	ug/L	40	38.0	95	80-120	
Molybdenum	ug/L	40	38.6	97	80-120	
Selenium	ug/L	40	37.6	94	80-120	
Thallium	ug/L	40	36.3	91	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2774104 2774105

Parameter	Units	60350962001 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	40	40	37.6	37.2	94	93	75-125	1	20	
Arsenic	ug/L	ND	40	40	39.3	38.8	97	96	75-125	1	20	
Barium	ug/L	16.0	40	40	54.1	52.8	95	92	75-125	2	20	
Beryllium	ug/L	ND	40	40	34.4	34.2	86	85	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.4	34.8	88	87	75-125	2	20	
Chromium	ug/L	ND	40	40	32.3	31.9	80	79	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2774104 2774105

Parameter	Units	60350962001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	39.6	39.3	99	98	75-125	1	20	
Lead	ug/L	ND	40	40	33.8	33.8	84	84	75-125	0	20	
Molybdenum	ug/L	7.6	40	40	51.1	50.5	109	107	75-125	1	20	
Selenium	ug/L	ND	40	40	36.4	35.5	91	88	75-125	3	20	
Thallium	ug/L	ND	40	40	33.5	33.2	83	83	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.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

QC Batch: 682830
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2760011 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	10/14/20 15:28	

LABORATORY CONTROL SAMPLE: 2760012

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1030	103	80-120	

SAMPLE DUPLICATE: 2760013

Parameter	Units	60350990003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	5780	6170	7	10	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

QC Batch: 685060
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

METHOD BLANK: 2769666 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/26/20 09:13	
Fluoride	mg/L	ND	0.20	10/26/20 09:13	
Sulfate	mg/L	ND	1.0	10/26/20 09:13	

METHOD BLANK: 2770399 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/27/20 09:06	
Fluoride	mg/L	ND	0.20	10/27/20 09:06	
Sulfate	mg/L	ND	1.0	10/27/20 09:06	

METHOD BLANK: 2771511 Matrix: Water
Associated Lab Samples: 60350963001, 60350963002, 60350963003, 60350963005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	104	80-120	

LABORATORY CONTROL SAMPLE: 2770400

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

LABORATORY CONTROL SAMPLE: 2771512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Fluoride	mg/L	2.5	2.6	102	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769668 2769669

Parameter	Units	60350879002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769671 2769672

Parameter	Units	60350879003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.0	10	10	31.9	32.7	109	117	80-120	2	15	
Fluoride	mg/L	0.22	2.5	2.5	2.1	2.1	77	75	80-120	2	15	M1
Sulfate	mg/L	2610	2500	2500	5210	5260	104	106	80-120	1	15	M1

SAMPLE DUPLICATE: 2769670

Parameter	Units	60350879002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	126	122	4	15	
Fluoride	mg/L	0.64	0.64	1	15	
Sulfate	mg/L	323	310	4	15	

SAMPLE DUPLICATE: 2769673

Parameter	Units	60350879003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	21.0	21.0	0	15	
Fluoride	mg/L	0.22	ND		15	
Sulfate	mg/L	2610	2740	5	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

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.

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

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60350963

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350963001	**ASH-02-CCR**	EPA 3010	686333	EPA 6010	686502
60350963002	**DUP-04**	EPA 3010	686333	EPA 6010	686502
60350963003	**ASH-05-CCR**	EPA 3010	686333	EPA 6010	686502
60350963005	**ERB-04**	EPA 3010	686333	EPA 6010	686502
60350963001	**ASH-02-CCR**	EPA 3010	686335	EPA 6020	686504
60350963002	**DUP-04**	EPA 3010	686335	EPA 6020	686504
60350963003	**ASH-05-CCR**	EPA 3010	686335	EPA 6020	686504
60350963005	**ERB-04**	EPA 3010	686335	EPA 6020	686504
60350963001	**ASH-02-CCR**	EPA 7470	682721	EPA 7470	682799
60350963002	**DUP-04**	EPA 7470	682721	EPA 7470	682799
60350963003	**ASH-05-CCR**	EPA 7470	682721	EPA 7470	682799
60350963005	**ERB-04**	EPA 7470	682721	EPA 7470	682799
60350963001	**ASH-02-CCR**	SM 2540C	682830		
60350963002	**DUP-04**	SM 2540C	682830		
60350963003	**ASH-05-CCR**	SM 2540C	682830		
60350963005	**ERB-04**	SM 2540C	682830		
60350963001	**ASH-02-CCR**	EPA 9056	685060		
60350963002	**DUP-04**	EPA 9056	685060		
60350963003	**ASH-05-CCR**	EPA 9056	685060		
60350963005	**ERB-04**	EPA 9056	685060		

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Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60350963

60350963

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1907 0730 0485 Pace Shipping Label Used? Yes ☐ No ☐

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T298 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 4.5 **Corr. Factor** -0.4 **Corrected** 4.1

Date and initials of person examining contents: 10/020 MK

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot# 003173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 0920	Start:
End: 0923	End:
Temp: 4.1	Temp:

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02-CCR	WT	G	10/9/20	8:30	—	—		3	2		1						✓	✓	✓	✓	✓			
2	DUP-04	WT	G	10/9/20	—	—	—		3	2		1						✓	✓	✓	✓	✓			
3	ASH-05-CCR	WT	G	10/9/20	11:00	—	—		3	2		1						✓	✓	✓	✓	✓			
4	BAT-11-CCR	WT	G	10/9/20	12:30	—	—		3	2		1						✓	✓	✓	✓	✓			
5	ERB-04	WT	G	10/9/20	12:45	—	—		3	2		1						✓	✓	✓	✓	✓		60350963	
6																									
7																									
8																									
9																									
10																									
11																									
12																									

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dobkowski	10/9/20	16:30	Miller Pace	10/10/20	0850	4.1	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski

DATE Signed (MM/DD/YY): 10/09/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Pace Analytical™ www.pacelabs.com

Page: of

Section A Required Client Information:		**Section B** Required Project Information:		**Section C** Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone: (303) 740-2614	Fax:	Project Name:	PRPA Rawhide	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location ***STATE:*** CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Y/N	Analysis Test: 9056 Cl, F, SO4	Analysis Test: 6020 Total Metals*	Analysis Test: 6010 Total Metals**	Analysis Test: 7470 Total Mercury	Analysis Test: 2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02-CCR	WT	G	10/9/20	8:30	---	---		3	2		1							X	X	X	X	X		
2	DUP-04	WT	G	10/9/20	---	---	---		3	2		1							X	X	X	X	X		
3	ASH-05-CCR	WT	G	10/9/20	11:00	---	---		3	2		1							X	X	X	X	X		
4	ERB-04	WT	G	10/9/20	12:45	---	---		3	2		1							X	X	X	X	X		
5																										
6																										
7																										
8																										
9																										
10																										
11																										
12																										

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	See Original COC	10/9/20	16:30	See Original COC	10/10/20	8:50	
**B, Ca, Li							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski / Revised by Brian Rothmeyer (11/2/2020)

SIGNATURE of SAMPLER: See Original COC **DATE Signed (MM/DD/YY):** 10/9/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60351403
Sampling Event: October 9, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 21, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 9th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: Parent Sample: BAT-04R-CCR; Field Duplicate: DUP-02-CCR	X		

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td></td><td>• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.</td><td></td><td></td><td></td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table>
<tr><th>Analyte</th><th>Concentration</th></tr>
<tr><td colspan="2">60351403</td></tr>
<tr><td colspan="2">ERB-04-CCR</td></tr>
<tr><td>Radium-228</td><td>1.41 ± 0.584 pCi/L</td></tr>
<tr><td>Total Radium</td><td>1.53 ± 1.48 pCi/L</td></tr>
</table>
pCi/L – Picocuries Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Detection Limits Mets</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td>X</td><td></td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the associated radium-228 and total radium sample results were reported at concentrations less than the minimum detectable concentration (MDC), qualification was not considered necessary.</td></tr>
</table>

< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio \
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 10, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351403001	**ASH-02-CCR**	Water	10/09/20 08:30	10/10/20 10:00
60351403002	**DUP-04**	Water	10/09/20 00:00	10/10/20 10:00
60351403003	**ASH-05-CCR**	Water	10/09/20 11:00	10/10/20 10:00
60351403005	**ERB-04**	Water	10/09/20 12:45	10/10/20 10:00

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351403001	**ASH-02-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403002	**DUP-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403003	**ASH-05-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351403005	**ERB-04**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Sample: ASH-02-CCR **Lab ID: 60351403001** Collected: 10/09/20 08:30 Received: 10/10/20 10:00 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 903.1	**-0.0655 ± 0.426 (0.924) C:NA T:98%**	pCi/L	10/27/20 12:19	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.355 ± 0.363 (0.753) C:71% T:101%**	pCi/L	10/26/20 14:18	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.355 ± 0.789 (1.68)**	pCi/L	10/28/20 15:21	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Sample: DUP-04 **Lab ID: 60351403002** Collected: 10/09/20 00:00 Received: 10/10/20 10:00 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 903.1	**0.000 ± 0.508 (1.04) C:NA T:92%**	pCi/L	10/27/20 12:19	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.339 ± 0.423 (0.897) C:75% T:82%**	pCi/L	10/26/20 14:18	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.339 ± 0.931 (1.94)**	pCi/L	10/28/20 15:21	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Sample: ASH-05-CCR **Lab ID: 60351403003** Collected: 10/09/20 11:00 Received: 10/10/20 10:00 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 903.1	**0.687 ± 0.545 (0.740) C:NA T:97%**	pCi/L	10/27/20 12:32	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.619 ± 0.425 (0.815) C:73% T:86%**	pCi/L	10/26/20 14:18	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.31 ± 0.970 (1.56)**	pCi/L	10/28/20 15:21	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Sample: ERB-04 **Lab ID: 60351403005** Collected: 10/09/20 12:45 Received: 10/10/20 10:00 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 903.1	**0.118 ± 0.283 (0.546) C:NA T:108%**	pCi/L	10/27/20 12:32	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.41 ± 0.584 (0.938) C:73% T:80%**	pCi/L	10/26/20 14:18	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.53 ± 0.867 (1.48)**	pCi/L	10/28/20 15:21	7440-14-4	

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

QC Batch: 419066
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

METHOD BLANK: 2026020 Matrix: Water
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.0621 ± 0.322 (0.746) C:NA T:88%	pCi/L	10/27/20 12:04	

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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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

QC Batch: 419067
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

METHOD BLANK: 2026021 Matrix: Water
Associated Lab Samples: 60351403001, 60351403002, 60351403003, 60351403005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.425 ± 0.426 (0.874) C:71% T:72%	pCi/L	10/26/20 14:18	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

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.

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.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351403

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351403001	**ASH-02-CCR**	EPA 903.1	419066		
60351403002	**DUP-04**	EPA 903.1	419066		
60351403003	**ASH-05-CCR**	EPA 903.1	419066		
60351403005	**ERB-04**	EPA 903.1	419066		
60351403001	**ASH-02-CCR**	EPA 904.0	419067		
60351403002	**DUP-04**	EPA 904.0	419067		
60351403003	**ASH-05-CCR**	EPA 904.0	419067		
60351403005	**ERB-04**	EPA 904.0	419067		
60351403001	**ASH-02-CCR**	Total Radium Calculation	420680		
60351403002	**DUP-04**	Total Radium Calculation	420680		
60351403003	**ASH-05-CCR**	Total Radium Calculation	420680		
60351403005	**ERB-04**	Total Radium Calculation	420680		

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: of

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	rev
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02-CCR	WT	G	10/9/20	8:30	—	—		2			2						✓	✓	✓		
2	DUP-04	WT	G	10/9/20	—	—	—		2			2						✓	✓	✓		
3	ASH-05-CCR	WT	G	10/9/20	11:00	—	—		2			2						✓	✓	✓		
4	BAT-11-CCR	WT	G	10/9/20	12:30	—	—		2			2						✓	✓	✓		
5	ERB-04	WT	G	10/9/20	12:45	—	—		2			2						✓	✓	✓		
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jeff Rabkewski WSH	10/9/20	16:30				

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Rabkewski

SIGNATURE of SAMPLER: Jeff Rabkewski DATE Signed (MM/DD/YY): 10/09/2020

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical Client Name: Pace KS Project # _____

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

Label _____
LIMS Login

Tracking #: 1908 6736 1069 SRM 10/10/2020

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used _____ Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp _____ °C Correction Factor: _____ °C Final Temp: _____ °C

Temp should be above freezing to 6°C

pH paper Lot# 10D0401 Date and Initials of person examining contents: SRM 10/10/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: W	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pHer2
All containers meet method preservation requirements.	✓			Initial when completed: SM Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: SM Date: 10/10/2020

Client Notification/ Resolution:

Person Contacted: _____ Date/Time: _____ Contacted By: _____

Comments/ Resolution: _____

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Page: of

Section A **Required** Client Information:		Section B **Required** Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location ***STATE:*** CO

Section D **Required** Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Analysis Test Y/N	Analysis Test: Radium-226	Analysis Test: Radium-228	Analysis Test: Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-02-CCR	WT	G	10/9/20	8:30	---	---		2		2								X	X	X		
2	DUP-04	WT	G	10/9/20	---	---	---		2		2								X	X	X		
3	ASH-05-CCR	WT	G	10/9/20	11:00	---	---		2		2								X	X	X		
4	ERB-04	WT	G	10/9/20	12:45	---	---		2		2								X	X	X		
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	See Original COC	10/9/20	16:30	See Original COC	10/10/20		

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski / Revised by Brian Rothmeyer (11/2/2020)

SIGNATURE of SAMPLER: See Original COC **DATE Signed (MM/DD/YY):** 10/9/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Quality Control Sample Performance Assessment

Test: Ra-226
Analyst: MK1
Date: 10/21/2020
Batch ID: 56818
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026020
MB concentration:	-0.062
M/B Counting Uncertainty:	0.322
MB MDC:	0.746
MB Numerical Performance Indicator:	-0.38
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS56818	LCSD56818
Count Date:	10/27/2020	10/27/2020
Spike I.D.:	20-032	20-032
Spike Concentration (pCi/mL):	32.182	32.182
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.657	0.664
Target Conc. (pCi/L, g, F):	4.898	4.849
Uncertainty (Calculated):	0.230	0.228
Result (pCi/L, g, F):	4.115	4.133
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.014	0.960
Numerical Performance Indicator:	-1.47	-1.42
Percent Recovery:	84.03%	85.23%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	73%	73%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/9/2020	
Sample I.D.	30386896001	
Sample MS I.D.	30386896001MS	
Sample MSD I.D.		
Spike I.D.:	20-032	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.183	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.656	
MS Target Conc.(pCi/L, g, F):	9.808	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.461	
MSD Spike Uncertainty (calculated):		
Sample Result:	0.250	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.301	
Sample Matrix Spike Result:	9.905	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.599	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:	-0.178	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	98.43%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	N/A	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	136%	
MS/MSD Lower % Recovery Limits:	71%	

Duplicate Sample Assessment		
Sample I.D.:	LCS56818	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD56818	
Sample Result (pCi/L, g, F):	4.115	
Sample Result Counting Uncertainty (pCi/L, g, F):	1.014	
Sample Duplicate Result (pCi/L, g, F):	4.133	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.960	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	-0.024	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	1.42%	
Duplicate Status vs Numerical Indicator:	N/A	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	32%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

10-27-20 MK

Quality Control Sample Performance Assessment

Test: Ra-228
Analyst: VAL
Date: 10/23/2020
Worklist: 56819
Matrix: WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026021
MB concentration:	0.425
M/B 2 Sigma CSU:	0.426
MB MDC:	0.874
MB Numerical Performance Indicator:	1.95
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	Y
	LCS56819	LCSD56819
Count Date:	10/26/2020	10/26/2020
Spike I.D.:	20-030	20-030
Decay Corrected Spike Concentration (pCi/mL):	37.879	37.879
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.806	0.808
Target Conc. (pCi/L, g, F):	4.697	4.689
Uncertainty (Calculated):	0.230	0.230
Result (pCi/L, g, F):	4.010	3.335
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.026	0.858
Numerical Performance Indicator:	-1.28	-2.99
Percent Recovery:	85.37%	71.12%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass
Upper % Recovery Limits:	135%	135%
Lower % Recovery Limits:	60%	60%

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/9/2020	
Sample I.D.	30386896001	
Sample MS I.D.	30386896001MS	
Sample MSD I.D.		
Spike I.D.:	20-030	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	38.094	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.812	
MS Target Conc.(pCi/L, g, F):	9.379	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.460	
MSD Spike Uncertainty (calculated):		
Sample Result:	0.541	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.363	
Sample Matrix Spike Result:	7.488	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.559	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:	-2.862	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	74.07%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	Warning	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	135%	
MS/MSD Lower % Recovery Limits:	60%	

Duplicate Sample Assessment		
Sample I.D.:	LCS56819	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	LCSD56819	
Sample Result (pCi/L, g, F):	4.010	
Sample Result 2 Sigma CSU (pCi/L, g, F):	1.026	
Sample Duplicate Result (pCi/L, g, F):	3.335	
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	0.858	
Are sample and/or duplicate results below RL?	NO	
Duplicate Numerical Performance Indicator:	0.990	
(Based on the LCS/LCSD Percent Recoveries) Duplicate RPD:	18.20%	
Duplicate Status vs Numerical Indicator:	Pass	
Duplicate Status vs RPD:	Pass	
% RPD Limit:	36%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

JJ 10/27/20

CM 10/27/2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60351578
Sampling Event: October 15, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 21, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60351403</td></tr><tr><td colspan="2">ERB-04-CCR</td></tr><tr><td>Radium-228</td><td>1.41 ± 0.584 pCi/L</td></tr><tr><td>Total Radium</td><td>1.53 ± 1.48 pCi/L</td></tr></table>pCi/L – Picocuries Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Detection Limits Mets</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.
<table><tr><th>Sample</th><th>Analyte</th><th>Result (pCi/L)</th><th>2 Sigma (σ) Uncertainty</th><th>MDC (pCi/L)</th></tr><tr><td>ASH-04-CCR</td><td>Radium-226</td><td>0.309</td><td>± 0.351</td><td>0.554</td></tr><tr><td>ASH-07-CCR</td><td>Radium-226</td><td>0.261</td><td>± 0.297</td><td>0.469</td></tr></table>± – Plus or Minus
pCi/L – Picocuries Per Liter
MDC – Minimum Detectable Concentration</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated radium-228 and total radium results for sample ASH-04-CCR were reported at concentrations greater than the minimum detectable concentration (MDC) and reported at concentrations less than 5x the concentration of the blank contamination and were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.

2 – The associated results where the 2 sigma (σ) uncertainty multiplied by 1.65 was greater than the reported MDC were qualified as estimated (J v) indicating the detection limit criteria was not met.</td></tr>
</table>

< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
± – Plus or Minus/High or Low Bias
be – Equipment Blank Contamination
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
v – Compound Identification Issue

Pace Analytical Services, LLC
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November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351578001	**ASH-03-CCR**	Water	10/15/20 09:22	10/16/20 09:30
60351578002	**ASH-07-CCR**	Water	10/15/20 11:20	10/16/20 09:30
60351578003	**ASH-04-CCR**	Water	10/15/20 13:55	10/16/20 09:30
60351578004	**ASH-07-CCR-MS**	Water	10/15/20 11:20	10/16/20 09:30
60351578005	**ASH-07-CCR-MSD**	Water	10/15/20 11:20	10/16/20 09:30

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351578001	**ASH-03-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578002	**ASH-07-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578003	**ASH-04-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA
60351578004	**ASH-07-CCR-MS**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
60351578005	**ASH-07-CCR-MSD**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Sample: ASH-03-CCR **Lab ID: 60351578001** Collected: 10/15/20 09:22 Received: 10/16/20 09:30 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 903.1	**0.622 ± 0.463 (0.609) C:NA T:90%**	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.289 ± 0.365 (0.775) C:79% T:89%**	pCi/L	10/30/20 14:00	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.911 ± 0.828 (1.38)**	pCi/L	11/05/20 14:26	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Sample: ASH-07-CCR **Lab ID: 60351578002** Collected: 10/15/20 11:20 Received: 10/16/20 09:30 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 903.1	**0.261 ± 0.297 (0.469) C:NA T:90%**	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.209 ± 0.350 (0.762) C:77% T:89%**	pCi/L	10/30/20 14:00	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**0.470 ± 0.647 (1.23)**	pCi/L	11/05/20 14:26	7440-14-4	

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Sample: ASH-04-CCR **Lab ID: 60351578003** Collected: 10/15/20 13:55 Received: 10/16/20 09:30 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 903.1	**0.309 ± 0.351 (0.554) C:NA T:93%**	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.52 ± 0.547 (0.796) C:77% T:86%**	pCi/L	10/30/20 14:01	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.83 ± 0.898 (1.35)**	pCi/L	11/05/20 14:26	7440-14-4	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Sample: ASH-07-CCR-MS **Lab ID: 60351578004** Collected: 10/15/20 11:20 Received: 10/16/20 09:30 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 903.1	**90.61 %REC ± NA (NA) C:NA T:NA%**	pCi/L	11/05/20 12:44	13982-63-3	
		Pace Analytical Services - Greensburg				
Radium-228	EPA 904.0	**79.33 %REC ± NA (NA) C:NA T:NA**	pCi/L	10/30/20 14:01	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Sample: ASH-07-CCR-MSD **Lab ID: 60351578005** Collected: 10/15/20 11:20 Received: 10/16/20 09:30 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 903.1	**106.64 %REC 16.25 RPD ± NA (NA) C:NA T:NA%**	pCi/L	11/05/20 12:44	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**79.98 %REC 0.82 RPD ± NA (NA) C:NA T:NA**	pCi/L	10/30/20 14:01	15262-20-1	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

QC Batch: 419095
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

METHOD BLANK: 2026059 Matrix: Water
Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.256 ± 0.410 (0.890) C:75% T:73%	pCi/L	10/30/20 14:01	

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: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

QC Batch: 419096
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

METHOD BLANK: 2026060 Matrix: Water
Associated Lab Samples: 60351578001, 60351578002, 60351578003, 60351578004, 60351578005

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.130 ± 0.198 (0.520) C:NA T:88%	pCi/L	11/05/20 12:29	

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: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

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.

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351578

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351578001	**ASH-03-CCR**	EPA 903.1	419096		
60351578002	**ASH-07-CCR**	EPA 903.1	419096		
60351578003	**ASH-04-CCR**	EPA 903.1	419096		
60351578004	**ASH-07-CCR-MS**	EPA 903.1	419096		
60351578005	**ASH-07-CCR-MSD**	EPA 903.1	419096		
60351578001	**ASH-03-CCR**	EPA 904.0	419095		
60351578002	**ASH-07-CCR**	EPA 904.0	419095		
60351578003	**ASH-04-CCR**	EPA 904.0	419095		
60351578004	**ASH-07-CCR-MS**	EPA 904.0	419095		
60351578005	**ASH-07-CCR-MSD**	EPA 904.0	419095		
60351578001	**ASH-03-CCR**	Total Radium Calculation	421823		
60351578002	**ASH-07-CCR**	Total Radium Calculation	421823		
60351578003	**ASH-04-CCR**	Total Radium Calculation	421823		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	rev
Project Number:	60630107

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-03-CCR	WT	G			10/15/20	922		2			X						X	X	X	X		
2	ASH-07-CCR	WT	G			10/15/20	1120		6			X						X	X	X	X		
3	ASH-04-CCR	WT	G			10/15/20	1355		2			X						X	X	X	X		
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS: Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
MS/MSD @ ASH07		10/15/20	1730		10-16-20	0930	N/A	N	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hardeman

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/15/20

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Quality Control Sample Performance Assessment

Pace Analytical
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Test:	Ra-226
Analyst:	MK1
Date:	10/27/2020
Batch ID:	56847
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026060
MB concentration:	-0.130
M/B Counting Uncertainty:	0.190
MB MDC:	0.520
MB Numerical Performance Indicator:	-1.34
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56847	LCSD56847
Count Date:	11/5/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.182	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.656	
Target Conc. (pCi/L, g, F):	4.908	
Uncertainty (Calculated):	0.231	
Result (pCi/L, g, F):	4.620	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.842	
Numerical Performance Indicator:	-0.65	
Percent Recovery:	94.13%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/15/2020	10/13/2020
Sample I.D.	60351578002	30387693001
Sample MS I.D.	60351578004	30387693001MS
Sample MSD I.D.	60351578005	
Spike I.D.:	20-032	20-032
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.183	32.183
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	
MS Aliquot (L, g, F):	0.656	0.665
MS Target Conc.(pCi/L, g, F):	9.816	9.679
MSD Aliquot (L, g, F):	0.642	
MSD Target Conc. (pCi/L, g, F):	10.023	
MS Spike Uncertainty (calculated):	0.461	0.455
MSD Spike Uncertainty (calculated):	0.471	
Sample Result:	0.261	-0.042
Sample Result Counting Uncertainty (pCi/L, g, F):	0.296	0.142
Sample Matrix Spike Result:	9.156	11.886
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.260	1.541
Sample Matrix Spike Duplicate Result:	10.949	
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.337	
MS Numerical Performance Indicator:	-1.314	2.732
MSD Numerical Performance Indicator:	0.901	
MS Percent Recovery:	90.61%	123.23%
MSD Percent Recovery:	106.64%	
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:	N/A	
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60351578002	
Sample MS I.D.	60351578004	
Sample MSD I.D.	60351578005	
Sample Matrix Spike Result:	9.156	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.260	
Sample Matrix Spike Duplicate Result:	10.949	
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.337	
Duplicate Numerical Performance Indicator:	-1.914	
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	16.25%	
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A	
MS/ MSD Duplicate Status vs RPD:	Pass	
% RPD Limit:	32%	

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

SLC 11/5/2020

Quality Control Sample Performance Assessment

Pace Analytical™ www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	10/28/2020
Worklist:	56846
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026059
MB concentration:	0.256
M/B 2 Sigma CSU:	0.410
MB MDC:	0.890
MB Numerical Performance Indicator:	1.22
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56846	LCSD56846
Count Date:	10/30/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	37.829	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.818	
Target Conc. (pCi/L, g, F):	4.624	
Uncertainty (Calculated):	0.227	
Result (pCi/L, g, F):	4.012	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.007	
Numerical Performance Indicator:	-1.16	
Percent Recovery:	86.77%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/14/2020	10/15/2020
Sample I.D.	30387694001	60351578002
Sample MS I.D.	30387694001MS	60351578004
Sample MSD I.D.		60351578005
Spike I.D.:	20-030	20-030
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	38.029	38.029
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):		0.20
MS Aliquot (L, g, F):	0.808	0.814
MS Target Conc.(pCi/L, g, F):	9.419	9.349
MSD Aliquot (L, g, F):		0.817
MSD Target Conc. (pCi/L, g, F):		9.307
MS Spike Uncertainty (calculated):	0.462	0.458
MSD Spike Uncertainty (calculated):		0.456
Sample Result:	0.015	0.209
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.330	0.350
Sample Matrix Spike Result:	7.063	7.625
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.531	1.587
Sample Matrix Spike Duplicate Result:		7.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.579
MS Numerical Performance Indicator:	-2.847	-2.244
MSD Numerical Performance Indicator:		-2.174
MS Percent Recovery:	74.82%	79.33%
MSD Percent Recovery:		79.98%
MS Status vs Numerical Indicator:	Warning	Warning
MSD Status vs Numerical Indicator:		Warning
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:		Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		60351578002
Sample MS I.D.		60351578004
Sample MSD I.D.		60351578005
Sample Matrix Spike Result:		7.625
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		1.587
Sample Matrix Spike Duplicate Result:		7.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		1.579
Duplicate Numerical Performance Indicator:		-0.025
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		0.82%
MS/ MSD Duplicate Status vs Numerical Indicator:		Pass
MS/ MSD Duplicate Status vs RPD:		Pass
% RPD Limit:		36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

11/2/20

11/2/2020

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60351615
Sampling Event: October 15, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 20, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 15th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
__X__ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X[1]	

Analyte	MS/MSD (%)	Limits (%)	RPD (%)	Limits (%)
ASH-07-CCR				
Chromium	**74/74**	75-125	0	20
Fluoride	**0/0**	80-120	0	15

% – Percent
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
RPD – Relative Percent Difference
Bold indicates a value that is outside of acceptance limits.

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Laboratory Duplicate</td><td>The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:
When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.
Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60350963</td></tr><tr><td colspan="2">ERB-04-CCR</td></tr><tr><td>TDS</td><td>12.0 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td></td><td>X[3]</td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td></td><td>X[4]</td><td></td></tr>
<tr><td colspan="5">Comments</td></tr>
<tr><td colspan="5">1 – As the potential bias implied by the MS/MSD recoveries were considered to be low, the associated chromium result for sample ASH-07-CCR was qualified as estimated (UJ- m).

As the potential bias implied by the MS/MSD recoveries were considered to be low for fluoride, and as the MS/MSD percent recoveries were less than the rejection limit of 30% for inorganics, the associated non-detect fluoride result for sample ASH-06-CCR was qualified as unusable (R).

2 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

3 – Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.</td></tr>
</table>

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
4 – With the exception of the non-detect fluoride result for sample ASH-07-CCR, which was qualified as unusable as the MS/MSD recoveries were below the rejection limit of 30% for inorganics, the results are usable as qualified for the project objective. The data are 98% complete.				

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
± – Plus or Minus/High or Low Bias
% – Percent
mg/L – Milligram per Liter
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
m – Matrix Spike Recovery
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
R – Unusable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids
UJ – Estimated

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
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November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 16, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351615001	**ASH-03-CCR**	Water	10/15/20 09:22	10/16/20 10:20
60351615002	**ASH-07-CCR**	Water	10/15/20 11:20	10/16/20 10:20
60351615003	**ASH-04-CCR**	Water	10/15/20 13:55	10/16/20 10:20

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351615001	**ASH-03-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K
60351615002	**ASH-07-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K
60351615003	**ASH-04-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

Pace Analytical Services, LLC
9608 Loiret Blvd.
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(913)599-5665

ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Sample: ASH-03-CCR **Lab ID: 60351615001** Collected: 10/15/20 09:22 Received: 10/16/20 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Boron	**782**	ug/L	100	1	11/04/20 14:50	11/05/20 20:56	7440-42-8	
Calcium	**445000**	ug/L	200	1	11/04/20 14:50	11/06/20 12:18	7440-70-2	
Lithium	**374**	ug/L	10.0	1	11/04/20 14:50	11/05/20 20:56	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-38-2	D3
Barium	**8.6**	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 17:54	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 17:54	7440-43-9	D3
Chromium	**8.4**	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-47-3	
Cobalt	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7439-98-7	D3
Selenium	**114**	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 17:54	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 10:54	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	**5400**	mg/L	125	1		10/21/20 09:38		
9056 IC Anions	Analytical Method: EPA 9056 Pace Analytical Services - Kansas City							
Chloride	**90.5**	mg/L	10.0	10		10/30/20 21:04	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/30/20 20:48	16984-48-8	
Sulfate	**3290**	mg/L	500	500		10/30/20 21:20	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Sample: ASH-07-CCR **Lab ID: 60351615002** Collected: 10/15/20 11:20 Received: 10/16/20 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Boron	**766**	ug/L	100	1	11/04/20 14:50	11/05/20 20:59	7440-42-8	
Calcium	**413000**	ug/L	1000	5	11/04/20 14:50	11/06/20 12:32	7440-70-2	M1
Lithium	**494**	ug/L	10.0	1	11/04/20 14:50	11/05/20 20:59	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-38-2	D3
Barium	**13.0**	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:03	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:03	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-47-3	D3,M1
Cobalt	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7439-98-7	D3
Selenium	**183**	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:03	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 11:01	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	**8140**	mg/L	143	1		10/21/20 09:38		
9056 IC Anions	Analytical Method: EPA 9056 Pace Analytical Services - Kansas City							
Chloride	**197**	mg/L	10.0	10		10/30/20 21:37	16887-00-6	
Fluoride	ND	mg/L	0.20	1		10/30/20 23:13	16984-48-8	M1
Sulfate	**4390**	mg/L	500	500		10/31/20 00:18	14808-79-8	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Sample: ASH-04-CCR **Lab ID: 60351615003** Collected: 10/15/20 13:55 Received: 10/16/20 10:20 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Boron	**640**	ug/L	100	1	11/04/20 14:50	11/05/20 21:08	7440-42-8	
Calcium	**446000**	ug/L	200	1	11/04/20 14:50	11/06/20 12:39	7440-70-2	
Lithium	**341**	ug/L	10.0	1	11/04/20 14:50	11/05/20 21:08	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010 Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-38-2	D3
Barium	**13.5**	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:17	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/02/20 13:57	11/04/20 18:17	7440-43-9	D3
Chromium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-47-3	D3
Cobalt	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7439-92-1	D3
Molybdenum	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7439-98-7	D3
Selenium	**95.5**	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/02/20 13:57	11/04/20 18:17	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470 Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 11:08	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C Pace Analytical Services - Kansas City							
Total Dissolved Solids	**5840**	mg/L	125	1		10/21/20 09:39		
9056 IC Anions	Analytical Method: EPA 9056 Pace Analytical Services - Kansas City							
Chloride	**211**	mg/L	50.0	50		10/31/20 02:11	16887-00-6	
Fluoride	**0.29**	mg/L	0.20	1		10/31/20 01:55	16984-48-8	
Sulfate	**3340**	mg/L	500	500		10/31/20 02:27	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

QC Batch: 684295
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2766148 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/22/20 10:33	

LABORATORY CONTROL SAMPLE: 2766149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766150 2766151

Parameter	Units	60351615002 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	5	5	4.6	4.4	92	89	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766152 2766153

Parameter	Units	60351697001 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	5	5	4.8	4.8	96	96	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

QC Batch: 687198
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2777117 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	11/05/20 20:41	
Calcium	ug/L	ND	200	11/06/20 11:59	
Lithium	ug/L	ND	10.0	11/05/20 20:41	

LABORATORY CONTROL SAMPLE: 2777118

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	958	96	80-120	
Calcium	ug/L	10000	9890	99	80-120	
Lithium	ug/L	1000	959	96	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2777119 2777120

Parameter	Units	60351615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	766	1000	1000	1730	1730	96	96	75-125	0	20	
Calcium	ug/L	413000	10000	10000	477000	468000	634	550	75-125	2	20	M1
Lithium	ug/L	494	1000	1000	1420	1440	93	94	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

QC Batch: 686632
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2775263 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/04/20 17:22	
Arsenic	ug/L	ND	1.0	11/04/20 17:22	
Barium	ug/L	ND	1.0	11/04/20 17:22	
Beryllium	ug/L	ND	0.50	11/04/20 17:22	
Cadmium	ug/L	ND	0.50	11/04/20 17:22	
Chromium	ug/L	ND	1.0	11/04/20 17:22	
Cobalt	ug/L	ND	1.0	11/04/20 17:22	
Lead	ug/L	ND	1.0	11/04/20 17:22	
Molybdenum	ug/L	ND	1.0	11/04/20 17:22	
Selenium	ug/L	ND	1.0	11/04/20 17:22	
Thallium	ug/L	ND	1.0	11/04/20 17:22	

LABORATORY CONTROL SAMPLE: 2775264

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	37.1	93	80-120	
Arsenic	ug/L	40	36.6	92	80-120	
Barium	ug/L	40	36.0	90	80-120	
Beryllium	ug/L	40	36.8	92	80-120	
Cadmium	ug/L	40	37.0	92	80-120	
Chromium	ug/L	40	37.8	95	80-120	
Cobalt	ug/L	40	36.8	92	80-120	
Lead	ug/L	40	36.8	92	80-120	
Molybdenum	ug/L	40	37.7	94	80-120	
Selenium	ug/L	40	36.8	92	80-120	
Thallium	ug/L	40	35.7	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2775265 2775266

Parameter	Units	60351615002 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	40	40	37.3	37.3	93	93	75-125	0	20	
Arsenic	ug/L	ND	40	40	39.8	39.5	97	96	75-125	1	20	
Barium	ug/L	13.0	40	40	51.7	51.6	97	96	75-125	0	20	
Beryllium	ug/L	ND	40	40	32.1	32.7	80	82	75-125	2	20	
Cadmium	ug/L	ND	40	40	34.4	34.1	86	85	75-125	1	20	
Chromium	ug/L	ND	40	40	30.0	30.0	74	74	75-125	0	20	M1

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2775265 2775266

Parameter	Units	60351615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	40.2	40.0	99	99	75-125	0	20	
Lead	ug/L	ND	40	40	34.4	34.2	86	85	75-125	1	20	
Molybdenum	ug/L	ND	40	40	47.6	47.4	115	114	75-125	0	20	
Selenium	ug/L	183	40	40	223	225	100	106	75-125	1	20	
Thallium	ug/L	ND	40	40	34.7	34.4	87	86	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

QC Batch: 684213
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2765866 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	10/21/20 09:38	

LABORATORY CONTROL SAMPLE: 2765867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2765868

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8140	8190	1	10	

SAMPLE DUPLICATE: 2765869

Parameter	Units	60351697001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3720	3510	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

QC Batch: 686196
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351615001, 60351615002, 60351615003

METHOD BLANK: 2773545 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/30/20 09:12	
Fluoride	mg/L	ND	0.20	10/30/20 09:12	
Sulfate	mg/L	ND	1.0	10/30/20 09:12	

METHOD BLANK: 2775058 Matrix: Water
Associated Lab Samples: 60351615001, 60351615002, 60351615003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/02/20 16:54	
Fluoride	mg/L	ND	0.20	11/02/20 16:54	
Sulfate	mg/L	ND	1.0	11/02/20 16:54	

LABORATORY CONTROL SAMPLE: 2773546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE: 2775059

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773548 2773549

Parameter	Units	60351615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	197	50	50	249	254	102	113	80-120	2	15	E
Fluoride	mg/L	ND	2.5	2.5	ND	ND	0	0	80-120		15	M1
Sulfate	mg/L	4390	2500	2500	7180	7200	112	113	80-120	0	15	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

SAMPLE DUPLICATE: 2773555

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	197	193	2	15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	4390	4410	1	15	

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REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

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.

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

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
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.

Pace Analytical Services, LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351615

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351615001	**ASH-03-CCR**	EPA 3010	687198	EPA 6010	687268
60351615002	**ASH-07-CCR**	EPA 3010	687198	EPA 6010	687268
60351615003	**ASH-04-CCR**	EPA 3010	687198	EPA 6010	687268
60351615001	**ASH-03-CCR**	EPA 3010	686632	EPA 6020	686669
60351615002	**ASH-07-CCR**	EPA 3010	686632	EPA 6020	686669
60351615003	**ASH-04-CCR**	EPA 3010	686632	EPA 6020	686669
60351615001	**ASH-03-CCR**	EPA 7470	684295	EPA 7470	684520
60351615002	**ASH-07-CCR**	EPA 7470	684295	EPA 7470	684520
60351615003	**ASH-04-CCR**	EPA 7470	684295	EPA 7470	684520
60351615001	**ASH-03-CCR**	SM 2540C	684213		
60351615002	**ASH-07-CCR**	SM 2540C	684213		
60351615003	**ASH-04-CCR**	SM 2540C	684213		
60351615001	**ASH-03-CCR**	EPA 9056	686196		
60351615002	**ASH-07-CCR**	EPA 9056	686196		
60351615003	**ASH-04-CCR**	EPA 9056	686196		

Pace Analytical
www.pacelabs.com

Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60351615

60351615

Client Name: AECOM

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 1073 0095 60 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☒ ZIPLOC

Thermometer Used: T299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 0.5 **Corr. Factor** +0.2 **Corrected** 0.7

Date and initials of person examining contents: 10/20/20 MRC

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☒Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☒N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? (HNO3, H2SO4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) Lot# 1003173	☒Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start: 1252	Start:
End: 1300	End:
Temp: 0.7	Temp:

Pace Analytical
www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A
Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	60630103

Section C
Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-03-CCR	WT	G			10/15/20	9:22		3	X		X						X	X	X	X	X		
2	ASH-07-CCR	WT	G			10/15/20	11:20		9	X		X						X	X	X	X	X		
3	ASH-04-CCR	WT	G			10/15/20	13:55		3	X		X						X	X	X	X	X		
4																		X	X	X	X	X		
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Requested Analysis Filtered (Y/N)

Pace Project No./ Lab I.D.: 60351015

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb										
**B, Ca, Li ms/msD @ ASH-07	[signature]	10/15/20	1730	EBrockett / Pace	10/16/20	1020	C7	Y	Y	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeremy Hutchinson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/15/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60351700
Sampling Event: October 16, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 20, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 16th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_X_ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.	X		
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%. • Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.			X

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%. • Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.			X
Equipment Blanks	No target analytes reported in the associated equipment blank. **60350963** **ERB-04-CCR** TDS: 12.0 mg/L mg/L – Milligrams per Liter TDS – Total Dissolved Solids		X[1]	
Reporting Limits Met	No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.		X[2]	
Reporting	No reporting issues were found and further qualification was not considered necessary.	X		
Package Completeness	No results were qualified as unusable and the data are 100% complete.	X		

Comments

1 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

2 – Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
% – Percent
mg/L – Milligram per Liter
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

November 09, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 17, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351700001	**ASH-06-CCR**	Water	10/16/20 09:00	10/17/20 08:35

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351700001	**ASH-06-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	VRP	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Sample: ASH-06-CCR **Lab ID: 60351700001** Collected: 10/16/20 09:00 Received: 10/17/20 08:35 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**312**	ug/L	100	1	11/04/20 16:48	11/05/20 20:08	7440-42-8	
Calcium	**24500**	ug/L	200	1	11/04/20 16:48	11/05/20 20:08	7440-70-2	
Lithium	**51.6**	ug/L	10.0	1	11/04/20 16:48	11/05/20 20:08	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-38-2	D3
Barium	**47.7**	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-39-3	
Beryllium	ND	ug/L	1.5	3	11/03/20 11:15	11/07/20 17:33	7440-41-7	D3
Cadmium	ND	ug/L	1.5	3	11/03/20 11:15	11/07/20 17:33	7440-43-9	D3
Chromium	**5.1**	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-47-3	
Cobalt	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-48-4	D3
Lead	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7439-92-1	D3
Molybdenum	**17.7**	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7439-98-7	
Selenium	**27.6**	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7782-49-2	
Thallium	ND	ug/L	3.0	3	11/03/20 11:15	11/07/20 17:33	7440-28-0	D3
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/21/20 14:27	10/22/20 11:19	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**417**	mg/L	10.0	1		10/21/20 09:41		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**7.7**	mg/L	1.0	1		10/31/20 02:43	16887-00-6	
Fluoride	**0.84**	mg/L	0.20	1		10/31/20 02:43	16984-48-8	
Sulfate	**82.8**	mg/L	10.0	10		10/31/20 03:00	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

QC Batch: 684295
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351700001

METHOD BLANK: 2766148 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/22/20 10:33	

LABORATORY CONTROL SAMPLE: 2766149

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766150 2766151

Parameter	Units	60351615002 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	5	5	4.6	4.4	92	89	75-125	4	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2766152 2766153

Parameter	Units	60351697001 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	5	5	4.8	4.8	96	96	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

QC Batch: 687269
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351700001

METHOD BLANK: 2777327 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	11/05/20 19:53	
Calcium	ug/L	ND	200	11/06/20 13:33	
Lithium	ug/L	ND	10.0	11/05/20 19:53	

LABORATORY CONTROL SAMPLE: 2777328

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	959	96	80-120	
Calcium	ug/L	10000	9930	99	80-120	
Lithium	ug/L	1000	976	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2777329 2777330

Parameter	Units	60351697001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	ND	1000	1000	1500	1400	112	102	75-125	7	20	
Calcium	ug/L	374000	10000	10000	378000	373000	41	-10	75-125	1	20	M1
Lithium	ug/L	172	1000	1000	1250	1170	107	100	75-125	6	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

QC Batch: 686726
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City

Associated Lab Samples: 60351700001

METHOD BLANK: 2775521 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/07/20 16:40	
Arsenic	ug/L	ND	1.0	11/07/20 16:40	
Barium	ug/L	ND	1.0	11/07/20 16:40	
Beryllium	ug/L	ND	0.50	11/07/20 16:40	
Cadmium	ug/L	ND	0.50	11/07/20 16:40	
Chromium	ug/L	ND	1.0	11/07/20 16:40	
Cobalt	ug/L	ND	1.0	11/07/20 16:40	
Lead	ug/L	ND	1.0	11/07/20 16:40	
Molybdenum	ug/L	ND	1.0	11/07/20 16:40	
Selenium	ug/L	ND	1.0	11/07/20 16:40	
Thallium	ug/L	ND	1.0	11/07/20 16:40	

LABORATORY CONTROL SAMPLE: 2775522

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.3	96	80-120	
Arsenic	ug/L	40	38.9	97	80-120	
Barium	ug/L	40	37.4	93	80-120	
Beryllium	ug/L	40	38.1	95	80-120	
Cadmium	ug/L	40	37.6	94	80-120	
Chromium	ug/L	40	37.4	93	80-120	
Cobalt	ug/L	40	38.1	95	80-120	
Lead	ug/L	40	37.1	93	80-120	
Molybdenum	ug/L	40	39.9	100	80-120	
Selenium	ug/L	40	37.6	94	80-120	
Thallium	ug/L	40	36.2	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2775523 2775524

Parameter	Units	60351697001 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	40	40	37.5	38.2	94	95	75-125	2	20	
Arsenic	ug/L	ND	40	40	39.4	40.3	97	100	75-125	2	20	
Barium	ug/L	18.3	40	40	54.8	56.5	91	95	75-125	3	20	
Beryllium	ug/L	ND	40	40	35.0	35.4	87	88	75-125	1	20	
Cadmium	ug/L	ND	40	40	35.6	36.4	89	91	75-125	2	20	
Chromium	ug/L	ND	40	40	33.7	34.8	83	86	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2775523 2775524

Parameter	Units	60351697001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	36.9	37.9	92	94	75-125	3	20	
Lead	ug/L	ND	40	40	37.4	38.5	93	96	75-125	3	20	
Molybdenum	ug/L	3.2	40	40	45.3	45.9	105	107	75-125	1	20	
Selenium	ug/L	ND	40	40	37.1	37.2	92	93	75-125	0	20	
Thallium	ug/L	ND	40	40	36.1	37.3	90	93	75-125	3	20	

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REPORT OF LABORATORY ANALYSIS

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9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

QC Batch: 684213
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351700001

METHOD BLANK: 2765866 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	10/21/20 09:38	

LABORATORY CONTROL SAMPLE: 2765867

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1000	100	80-120	

SAMPLE DUPLICATE: 2765868

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	8140	8190	1	10	

SAMPLE DUPLICATE: 2765869

Parameter	Units	60351697001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	3720	3510	6	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

QC Batch: 686196
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60351700001

METHOD BLANK: 2773545 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/30/20 09:12	
Fluoride	mg/L	ND	0.20	10/30/20 09:12	
Sulfate	mg/L	ND	1.0	10/30/20 09:12	

METHOD BLANK: 2775058 Matrix: Water
Associated Lab Samples: 60351700001

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	11/02/20 16:54	
Fluoride	mg/L	ND	0.20	11/02/20 16:54	
Sulfate	mg/L	ND	1.0	11/02/20 16:54	

LABORATORY CONTROL SAMPLE: 2773546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.1	102	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.1	103	80-120	

LABORATORY CONTROL SAMPLE: 2775059

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	99	80-120	
Fluoride	mg/L	2.5	2.5	99	80-120	
Sulfate	mg/L	5	5.0	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773548 2773549

Parameter	Units	60351615002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	197	50	50	249	254	102	113	80-120	2	15	E
Fluoride	mg/L	ND	2.5	2.5	ND	ND	0	0	80-120		15	M1
Sulfate	mg/L	4390	2500	2500	7180	7200	112	113	80-120	0	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

SAMPLE DUPLICATE: 2773555

Parameter	Units	60351615002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	197	193	2	15	
Fluoride	mg/L	ND	ND		15	
Sulfate	mg/L	4390	4410	1	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

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.

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

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
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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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60351700

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351700001	**ASH-06-CCR**	EPA 3010	687269	EPA 6010	687361
60351700001	**ASH-06-CCR**	EPA 3010	686726	EPA 6020	686968
60351700001	**ASH-06-CCR**	EPA 7470	684295	EPA 7470	684520
60351700001	**ASH-06-CCR**	SM 2540C	684213		
60351700001	**ASH-06-CCR**	EPA 9056	686196		

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www.pacelabs.com

Sample Condition Upon Receipt

WO# : 60351700

60351700

Client Name: AECOM

Courier: FedEx ☑ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1008 6736 0430 Pace Shipping Label Used? Yes ☐ No ☑

Custody Seal on Cooler/Box Present: Yes ☑ No ☐ Seals intact: Yes ☑ No ☐

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

Thermometer Used: T-298 **Type of Ice:** Wet Blue None

Cooler Temperature (°C): **As-read** 1.4 **Corr. Factor** -0.4 **Corrected** 1.0

Date and initials of person examining contents: 10-17-20 KP

Temperature should be above freezing to 6°C

Chain of Custody present:	☑Yes ☐No ☐N/A	
Chain of Custody relinquished:	☑Yes ☐No ☐N/A	
Samples arrived within holding time:	☑Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☑No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☑No ☐N/A	
Sufficient volume:	☑Yes ☐No ☐N/A	
Correct containers used:	☑Yes ☐No ☐N/A	
Pace containers used:	☑Yes ☐No ☐N/A	
Containers intact:	☑Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☑N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☑N/A	
Sample labels match COC: Date / time / ID / analyses	☑Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☑No ☐N/A	
Containers requiring pH preservation in compliance? (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO) LOT# 603173	☑Yes ☐No ☐N/A	List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only)	☐Yes ☐No	
Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☑N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☑N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☑N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☑N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide CCR	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	Ash-06-CCR	WT	G	—	—	10/16/20	9:00		3	X		X						X	X	X	X	X		11035170
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb		10/16/20	16:00	Dawson/pace	10-17-20	0835	1.0	Y	Y	Y
**B, Ca, Li										

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Graham Dawson

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 10/16/20

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60352322
Sampling Event: October 20, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 21, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 20th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

__X__ Data are usable without qualification.
_____ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X
Field Duplicate	The field duplicate sample results satisfied the evaluation criteria below: • The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60351403</td></tr><tr><td colspan="2">ERB-04-CCR</td></tr><tr><td>Radium-228</td><td>1.41 ± 0.584 pCi/L</td></tr><tr><td>Total Radium</td><td>1.53 ± 1.48 pCi/L</td></tr></table>pCi/L – Picocuries Per Liter</td><td></td><td>X[1]</td><td></td></tr>
<tr><td>Detection Limits Mets</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td>X</td><td></td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the associated radium-228 and total radium sample results were reported at concentrations less than the minimum detectable concentration (MDC), qualification was not considered necessary.</td></tr>
</table>

< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
v – Compound Identification Issue

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 12, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 22, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60352322001	**ASH-06-CCR**	Water	10/20/20 09:40	10/22/20 09:35

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60352322001	**ASH-06-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

Sample: ASH-06-CCR **Lab ID: 60352322001** Collected: 10/20/20 09:40 Received: 10/22/20 09:35 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 903.1	**0.213 ± 0.462 (0.852) C:NA T:82%**	pCi/L	11/11/20 14:43	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**0.899 ± 0.598 (1.16) C:63% T:80%**	pCi/L	11/11/20 12:31	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.11 ± 1.06 (2.01)**	pCi/L	11/12/20 10:35	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

QC Batch: 420034
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60352322001

METHOD BLANK: 2030364 Matrix: Water
Associated Lab Samples: 60352322001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	-0.187 ± 0.261 (0.661) C:NA T:95%	pCi/L	11/11/20 14:43	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

QC Batch: 420035
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60352322001

METHOD BLANK: 2030365 Matrix: Water
Associated Lab Samples: 60352322001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.194 ± 0.372 (0.811) C:70% T:90%	pCi/L	11/11/20 12:30	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

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.

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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.

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60352322

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60352322001	**ASH-06-CCR**	EPA 903.1	420034		
60352322001	**ASH-06-CCR**	EPA 904.0	420035		
60352322001	**ASH-06-CCR**	Total Radium Calculation	422802		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	rev
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH06-CCR	WT	G			10/20/20	940		2			X							X	X	X		
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Requested Analysis Filtered (Y/N)

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
		10/20/20	1630		10/22/20	0935	-	N	N	Y

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jenny Hutchman

SIGNATURE of SAMPLER: [signature]

DATE Signed (MM/DD/YY): 10/20/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KS Project #

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

Label BSM
LIMS Login BSM

Tracking #: 1908 6736 0331

Custody Seal on Cooler/Box Present: ☐ yes ☑ no Seals intact: ☐ yes ☐ no

Thermometer Used - Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp - °C Correction Factor: - °C Final Temp: - °C

Temp should be above freezing to 6°C

pH paper Lot# 10D0461 Date and Initials of person examining contents: BSM 10/22/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used:	✓			10.
-Pace Containers Used:	✓			
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pHc 2
All containers meet method preservation requirements.	✓			Initial when completed: BSM Date/time of preservation Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: BSM Date: 10/22/2020

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-226
Analyst:	MK1
Date:	11/3/2020
Batch ID:	56990
Matrix:	DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2030364
MB concentration:	-0.187
M/B Counting Uncertainty:	0.260
MB MDC:	0.661
MB Numerical Performance Indicator:	-1.41
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56990	LCSD56990
Count Date:	11/11/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.182	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.658	
Target Conc. (pCi/L, g, F):	4.889	
Uncertainty (Calculated):	0.230	
Result (pCi/L, g, F):	4.154	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.897	
Numerical Performance Indicator:	-1.55	
Percent Recovery:	84.97%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/21/2020	
Sample I.D.	30388966001	
Sample MS I.D.	30388966001MS	
Sample MSD I.D.		
Spike I.D.:	20-032	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.183	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.650	
MS Target Conc.(pCi/L, g, F):	9.897	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.465	
MSD Spike Uncertainty (calculated):		
Sample Result:	0.000	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.191	
Sample Matrix Spike Result:	8.014	
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.271	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
MS Numerical Performance Indicator:	-2.701	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	80.97%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	N/A	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	136%	
MS/MSD Lower % Recovery Limits:	71%	

Duplicate Sample Assessment		
Sample I.D.:	30388961001	Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.	30388961001DUP	
Sample Result (pCi/L, g, F):	0.050	
Sample Result Counting Uncertainty (pCi/L, g, F):	0.257	
Sample Duplicate Result (pCi/L, g, F):	0.000	
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	0.264	
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:	0.264	30388961001
Duplicate RPD:	200.00%	30388961001DUP
Duplicate Status vs Numerical Indicator:	N/A	
Duplicate Status vs RPD:	~~Fail***~~	
% RPD Limit:	~~32%~~	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

~~***Batch must be re-prepped due to unacceptable precision.~~

SLC 11/11/2020

CMC 11/11/2020

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	11/4/2020
Worklist:	56991
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2030365
MB concentration:	0.194
M/B 2 Sigma CSU:	0.372
MB MDC:	0.811
MB Numerical Performance Indicator:	1.02
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56991	LCSD56991
Count Date:	11/11/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	37.680	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.810	
Target Conc. (pCi/L, g, F):	4.654	
Uncertainty (Calculated):	0.228	
Result (pCi/L, g, F):	3.953	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.006	
Numerical Performance Indicator:	-1.33	
Percent Recovery:	84.93%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/21/2020	
Sample I.D.	30388966001	
Sample MS I.D.	30388966001MS	
Sample MSD I.D.		
Spike I.D.:	20-030	
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	37.945	
Spike Volume Used in MS (mL):	0.20	
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):	0.800	
MS Target Conc.(pCi/L, g, F):	9.483	
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):	0.465	
MSD Spike Uncertainty (calculated):		
Sample Result:	0.512	
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.377	
Sample Matrix Spike Result:	8.016	
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	1.698	
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:	-2.154	
MSD Numerical Performance Indicator:		
MS Percent Recovery:	79.13%	
MSD Percent Recovery:		
MS Status vs Numerical Indicator:	Warning	
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:	Pass	
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:	135%	
MS/MSD Lower % Recovery Limits:	60%	

Duplicate Sample Assessment		
Sample I.D.:	30388961001	Enter Duplicate
Duplicate Sample I.D.	30388961001DUP	sample IDs if
Sample Result (pCi/L, g, F):	0.487	other than
Sample Result 2 Sigma CSU (pCi/L, g, F):	0.405	LCS/LCSD in
Sample Duplicate Result (pCi/L, g, F):	-0.103	the space below.
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):	0.386	
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:	2.064	30388961001
Duplicate RPD:	306.83%	30388961001DUP
Duplicate Status vs Numerical Indicator:	Warning	
Duplicate Status vs RPD:	Fail***	
% RPD Limit:	36%	

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

11/12/20

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60353136
Sampling Event: October 5, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 21, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 5th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. **Analyte** / **Concentration** **MB 2026011** Radium-228 / 1.05 ± 0.493 pCi/L ± – Plus or Minus pCi/L – Picocuries Per Liter MB – Method Blank		X[1]	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table>
<tr><th>Analyte</th><th>Concentration</th></tr>
<tr><th colspan="2">60351403</th></tr>
<tr><td colspan="2">ERB-04-CCR</td></tr>
<tr><td>Radium-228</td><td>1.41 ± 0.584 pCi/L</td></tr>
<tr><td>Total Radium</td><td>1.53 ± 1.48 pCi/L</td></tr>
</table>
pCi/L – Picocuries Per Liter</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Detection Limits Mets</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td>X</td><td></td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated radium-228 result for sample ASH-01-CCR was reported at a concentration greater than the minimum detectable concentration (MDC) and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

2 – The associated radium-228 result for sample ASH-01-CCR was reported at a concentration greater than the MDC and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.</td></tr>
</table>

< – Less Than
≤ – Less Than or Equal To
σ – Sigma (Uncertainty)
pCi/L – Picocuries Per Liter
± – Plus or Minus/High or Low Bias
be – Equipment Blank Contamination
bl – Laboratory blank Contamination
DER – Duplicate Error Ratio
J – Estimated
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
MB – Method Blank
MDC – Minimum Detectable Concentration
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 08, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351175001	**ASH-01-CCR**	Water	10/05/20 09:15	10/08/20 09:30

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SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351175001	**ASH-01-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

Sample: ASH-01-CCR **Lab ID: 60351175001** Collected: 10/05/20 09:15 Received: 10/08/20 09:30 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 903.1	**0.202 ± 0.350 (0.626) C:NA T:85%**	pCi/L	10/28/20 13:39	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.12 ± 0.557 (0.981) C:72% T:73%**	pCi/L	10/30/20 11:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.32 ± 0.907 (1.61)**	pCi/L	11/01/20 12:49	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

QC Batch: 419061
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351175001

METHOD BLANK: 2026011
Matrix: Water
Associated Lab Samples: 60351175001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.455 (0.950) C:74% T:69%	pCi/L	10/30/20 11:59	
Radium-228	1.05 ± 0.493 (0.827) C:68% T:80%	pCi/L	10/26/20 15:15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

QC Batch: 419060
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351175001

METHOD BLANK: 2026010
Matrix: Water
Associated Lab Samples: 60351175001

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.319 ± 0.370 (0.598) C:NA T:92%	pCi/L	10/27/20 13:52	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

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.

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353136

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351175001	**ASH-01-CCR**	EPA 903.1	419060		
60351175001	**ASH-01-CCR**	EPA 904.0	419061		
60351175001	**ASH-01-CCR**	Total Radium Calculation	421105		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A
Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B
Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	rev
Project Number:	

Section C
Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D
Required Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-01-CCR	WT	G	10/5/20	9:15	—	—		2			2						✓	✓	✓			
2	BAT-04R-CCR	WT	G	10/6/20		—	—		2			2						✓	✓	✓			
3	DUP-02	WT	G	10/6/20	—	—	—		2			2						✓	✓	✓			
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS			
	Jeff Dobkowski	10/6/20	16:30	Emily T	10-8-20	0930	N/A	N	Y	Y

	Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski

DATE Signed (MM/DD/YY): 10/06/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: AECOM Project #

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

Label
LIMS Login

Tracking #: 1908 6736 1058

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used N/A Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp °C Correction Factor: °C Final Temp: °C

Temp should be above freezing to 6°C

pH paper Lot# 10D0401 Date and Initials of person examining contents: ET 10-8-2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT		✓		5. time on sample BAT-04R-CCR is 1330
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed ET Date/time of preservation
				Lot # of added preservative
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:		✓		18.
Trip Blank Custody Seals Present		✓		
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: ET Date: 10-8-2020

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

Page: of

Section A **Required** Client Information:		Section B **Required** Project Information:		Section C Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location ***STATE:*** CO

Requested Analysis Filtered (Y/N)

Section D **Required** Client Information

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	Section D Sample ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	ASH-01-CCR	WT	G	10/5/20	9:15	---	---		2		2								X	X	X		
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	See Original COC	10/6/20	16:30	See Original COC	10/8/20	9:30	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski / Revised by Brian Rothmeyer (11/2/2020)

SIGNATURE of SAMPLER: See Original COC **DATE Signed (MM/DD/YY):** 10/6/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Quality Control Sample Performance Assessment

Test: Ra-226
Analyst: MK1
Date: 10/2/2020
Batch ID: 56814
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026010
MB concentration:	0.319
M/B Counting Uncertainty:	0.368
MB MDC:	0.598
MB Numerical Performance Indicator:	1.70
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56814	LCSD56814
Count Date:	10/27/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.182	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.656	
Target Conc. (pCi/L, g, F):	4.902	
Uncertainty (Calculated):	0.230	
Result (pCi/L, g, F):	5.792	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.192	
Numerical Performance Indicator:	1.44	
Percent Recovery:	118.14%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/8/2020	10/8/2020
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Spike I.D.:	20-032	20-032
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.183	32.183
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.660	0.659
MS Target Conc.(pCi/L, g, F):	9.751	9.773
MSD Aliquot (L, g, F):	0.653	0.654
MSD Target Conc. (pCi/L, g, F):	9.855	9.840
MS Spike Uncertainty (calculated):	0.458	0.459
MSD Spike Uncertainty (calculated):	0.463	0.462
Sample Result:	0.339	0.119
Sample Result Counting Uncertainty (pCi/L, g, F):	0.367	0.438
Sample Matrix Spike Result:	8.724	10.220
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
Sample Matrix Spike Duplicate Result:	11.463	9.723
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.647	1.330
MS Numerical Performance Indicator:	-1.911	0.406
MSD Numerical Performance Indicator:	1.422	-0.313
MS Percent Recovery:	86.00%	103.36%
MSD Percent Recovery:	112.88%	97.61%
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:	N/A	N/A
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:		
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Sample Matrix Spike Result:	8.724	10.220
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
Sample Matrix Spike Duplicate Result:	11.463	9.723
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.647	1.330
Duplicate Numerical Performance Indicator:	-2.581	0.495
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	27.03%	5.72%
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A	N/A
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	32%	32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

10/28/2020

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	10/22/2020
Worklist:	56815
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026011
MB concentration:	1.053
M/B 2 Sigma CSU:	0.493
MB MDC:	0.827
MB Numerical Performance Indicator:	4.19
MB Status vs Numerical Indicator:	Fail*
MB Status vs. MDC:	Fail*

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56815	LCSD56815
Count Date:	10/26/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	37.878	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.818	
Target Conc. (pCi/L, g, F):	4.632	
Uncertainty (Calculated):	0.227	
Result (pCi/L, g, F):	5.132	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.196	
Numerical Performance Indicator:	0.81	
Percent Recovery:	110.80%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/8/2020	10/8/2020
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Spike I.D.:	20-030	20-030
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	38.107	38.107
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.807	0.810
MS Target Conc.(pCi/L, g, F):	9.447	9.407
MSD Aliquot (L, g, F):	0.811	0.818
MSD Target Conc. (pCi/L, g, F):	9.402	9.317
MS Spike Uncertainty (calculated):	0.463	0.461
MSD Spike Uncertainty (calculated):	0.461	0.457
Sample Result:	2.878	2.094
Sample Result 2 Sigma CSU (pCi/L, g, F):	1.119	0.907
Sample Matrix Spike Result:	10.637	9.649
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.260	2.301
Sample Matrix Spike Duplicate Result:	10.290	9.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.197	2.145
MS Numerical Performance Indicator:	-1.291	-1.443
MSD Numerical Performance Indicator:	-1.555	-1.452
MS Percent Recovery:	82.13%	80.31%
MSD Percent Recovery:	78.83%	81.13%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator:	Pass	Pass
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Sample Matrix Spike Result:	10.637	9.649
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.260	2.301
Sample Matrix Spike Duplicate Result:	10.290	9.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.197	2.145
Duplicate Numerical Performance Indicator:	0.216	-0.003
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	4.10%	1.01%
MS/ MSD Duplicate Status vs Numerical Indicator:	Pass	Pass
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	36%	36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:
*If the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

10/27/2020

Quality Control Sample Performance Assessment

Pace Analytical™
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Test:	Ra-228
Analyst:	VAL
Date:	10/22/2020
Worklist:	56815
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026011
MB concentration:	0.418
M/B 2 Sigma CSU:	0.455
MB MDC:	0.950
MB Numerical Performance Indicator:	1.80
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56815	LCSD56815
Count Date:	#N/A	#N/A
Spike I.D.:	#N/A	#N/A
Decay Corrected Spike Concentration (pCi/mL):	#N/A	#N/A
Volume Used (mL):		#N/A
Aliquot Volume (L, g, F):	#N/A	#N/A
Target Conc. (pCi/L, g, F):	#N/A	#N/A
Uncertainty (Calculated):	#N/A	#N/A
Result (pCi/L, g, F):	#N/A	#N/A
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	#N/A	
Numerical Performance Indicator:	#N/A	#N/A
Percent Recovery:	#N/A	#N/A
Status vs Numerical Indicator:	#N/A	#N/A
Status vs Recovery:	#N/A	#N/A
Upper % Recovery Limits:	#N/A	#N/A
Lower % Recovery Limits:	#N/A	#N/A

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

#N/A

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60353680
Sampling Event: October 8, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 20, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water sample collected October 8th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB.	X		
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges. Results in the native sample greater than four times the concentration of the spike added during digestions/extractions are not considered to be a representative measure of accuracy. Further action with respect to spike recovery evaluation or qualification of data was not considered necessary.		X[1]	

Analyte	MS/MSD (%)	Limits (%)	RPD (%)	Limits (%)
ASH-08-CCR				
Beryllium	**71/72**	75-125	1	20
Lead	**74**/75	75-125	1	20
Fluoride	**77/75**	80-120	2	15

% - Percent
MS/MSD – Matrix Spike/ Matrix Spike Duplicate
RPD – Relative Percent Difference
Bold indicates a value that is outside of acceptance limits

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Laboratory Duplicate</td><td>The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates:
When both the sample and duplicate values are >5x the reporting limit (RL), acceptable sampling and analytical precision is indicated by an relative percent difference (RPD) between the results of ≤20%.
Where the result for one or both analytes of the method duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the method duplicate results is <1xRL.</td><td>X</td><td></td><td></td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
When both the sample and duplicate values are >5xRL acceptable sampling and analytical precision is indicated by a RPD between the results of ≤30%.
Where the result for one or both analytes of the field duplicate pair is <5xRL, satisfactory precision is indicated if the absolute difference between the field duplicate results is <2xRL.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.<table><tr><th>Analyte</th><th>Concentration</th></tr><tr><td colspan="2">60350963</td></tr><tr><td colspan="2">ERB-04-CCR</td></tr><tr><td>TDS</td><td>12.0 mg/L</td></tr></table>mg/L – Milligrams per Liter
TDS – Total Dissolved Solids</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Reporting Limits Met</td><td>No samples performed at dilutions or reported as non-detect at elevated method detection limits/reporting limits.</td><td></td><td>X[3]</td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – As the potential bias implied by the MS/MSD recoveries were considered to be low, the associated beryllium, lead, and sulfate results for sample ASH-08-CCR were qualified as estimated (UJ-/J- m).

2 – As the TDS sample results were reported at concentrations >5x the concentration of the blank contamination, qualification was not considered necessary.

3 – Several analytes were reported as non-detect at elevated reporting limits. These non-detect results will need to be evaluated by the end user of the data with respect to project objectives.</td></tr>
</table>

> – Greater Than
< – Less Than
≤ – Less Than or Equal To
± – Plus or Minus/High or Low Bias
% – Percent
mg/L – Milligram per Liter
LCS – Laboratory Control Sample
LCSD – Laboratory Control Sample Duplicate
m – Matrix Spike Recovery
MB – Method Blank
MS/MSD – Matrix Spike/Matrix Spike Duplicate
NA – Not Applicable
RL – Reporting Limit
RPD – Relative Percent Difference
TDS – Total Dissolved Solids

Pace Analytical Services, LLC
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November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 09, 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 - Kansas City

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

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CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Pace Analytical Services Kansas
9608 Loiret Boulevard, Lenexa, KS 66219
Missouri Inorganic Drinking Water Certification #: 10090
Arkansas Drinking Water
Arkansas Certification #: 20-020-0
Arkansas Drinking Water
Illinois Certification #: 200030
Iowa Certification #: 118
Kansas/NELAP Certification #: E-10116
Louisiana Certification #: 03055
Nevada Certification #: KS000212020-2
Oklahoma Certification #: 9205/9935
Florida: Cert E871149 SEKS WET
Texas Certification #: T104704407-19-12
Utah Certification #: KS000212019-9
Illinois Certification #: 004592
Kansas Field Laboratory Accreditation: # E-92587
Missouri SEKS Micro Certification: 10070

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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60350879003	**ASH-08-CCR**	Water	10/08/20 13:30	10/09/20 08:50

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60350879003	**ASH-08-CCR**	EPA 6010	HKC	3	PASI-K
		EPA 6020	JGP	11	PASI-K
		EPA 7470	MRV	1	PASI-K
		SM 2540C	MAP	1	PASI-K
		EPA 9056	MJK	3	PASI-K

PASI-K = Pace Analytical Services - Kansas City

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ANALYTICAL RESULTS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Sample: ASH-08-CCR **Lab ID: 60350879003** Collected: 10/08/20 13:30 Received: 10/09/20 08:50 Matrix: Water

Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Boron	**1020**	ug/L	100	1	10/30/20 08:55	10/30/20 18:33	7440-42-8	
Calcium	**425000**	ug/L	200	1	10/30/20 08:55	10/30/20 18:33	7440-70-2	
Lithium	**339**	ug/L	10.0	1	10/30/20 08:55	10/30/20 18:33	7439-93-2	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010							
	Pace Analytical Services - Kansas City							
Antimony	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-36-0	D3
Arsenic	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-38-2	D3
Barium	**16.6**	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-39-3	
Beryllium	ND	ug/L	0.50	1	10/30/20 08:55	11/01/20 16:19	7440-41-7	M1
Cadmium	ND	ug/L	0.50	1	10/30/20 08:55	11/01/20 16:19	7440-43-9	
Chromium	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7440-47-3	D3
Cobalt	**1.7**	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7440-48-4	
Lead	ND	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7439-92-1	M1
Molybdenum	**1.5**	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7439-98-7	
Selenium	ND	ug/L	3.0	3	10/30/20 08:55	11/02/20 18:02	7782-49-2	D3
Thallium	ND	ug/L	1.0	1	10/30/20 08:55	11/01/20 16:19	7440-28-0	
7470 Mercury	Analytical Method: EPA 7470 Preparation Method: EPA 7470							
	Pace Analytical Services - Kansas City							
Mercury	ND	ug/L	0.20	1	10/14/20 13:29	10/15/20 12:05	7439-97-6	
2540C Total Dissolved Solids	Analytical Method: SM 2540C							
	Pace Analytical Services - Kansas City							
Total Dissolved Solids	**4830**	mg/L	100	1		10/14/20 08:58		
9056 IC Anions	Analytical Method: EPA 9056							
	Pace Analytical Services - Kansas City							
Chloride	**21.0**	mg/L	2.0	2		10/27/20 01:03	16887-00-6	
Fluoride	**0.22**	mg/L	0.20	1		10/26/20 23:58	16984-48-8	M1
Sulfate	**2610**	mg/L	500	500		10/27/20 02:08	14808-79-8	M1

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

QC Batch: 682721
QC Batch Method: EPA 7470
Analysis Method: EPA 7470
Analysis Description: 7470 Mercury
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350879003

METHOD BLANK: 2759679 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	10/15/20 12:01	

LABORATORY CONTROL SAMPLE: 2759680

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	5	4.6	93	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2759681 2759682

Parameter	Units	60350879003 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	5	5	4.9	4.6	96	92	75-125	5	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

QC Batch: 686072
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: 6010 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350879003

METHOD BLANK: 2773023 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Boron	ug/L	ND	100	10/30/20 17:58	
Calcium	ug/L	ND	200	10/30/20 17:58	
Lithium	ug/L	ND	10.0	10/30/20 17:58	

LABORATORY CONTROL SAMPLE: 2773024

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Boron	ug/L	1000	980	98	80-120	
Calcium	ug/L	10000	9340	93	80-120	
Lithium	ug/L	1000	1020	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773025 2773026

Parameter	Units	60350840001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	936	1000	1000	1880	1920	94	98	75-125	2	20	
Calcium	ug/L	372000	10000	10000	374000	383000	19	104	75-125	2	20	M1
Lithium	ug/L	253	1000	1000	1260	1270	101	102	75-125	1	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773027 2773028

Parameter	Units	60350879002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	244	1000	1000	1230	1250	99	100	75-125	1	20	
Calcium	ug/L	79600	10000	10000	86300	87800	67	82	75-125	2	20	M1
Lithium	ug/L	77.9	1000	1000	1090	1100	101	102	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773029 2773030

Parameter	Units	60350879003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Boron	ug/L	1020	1000	1000	2010	2040	100	102	75-125	1	20	
Calcium	ug/L	425000	10000	10000	434000	436000	85	111	75-125	1	20	
Lithium	ug/L	339	1000	1000	1400	1410	106	107	75-125	0	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

QC Batch: 686073
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350879003

METHOD BLANK: 2773033 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Antimony	ug/L	ND	1.0	11/02/20 17:08	
Arsenic	ug/L	ND	1.0	11/02/20 17:08	
Barium	ug/L	ND	1.0	11/02/20 17:08	
Beryllium	ug/L	ND	0.50	11/01/20 15:13	
Cadmium	ug/L	ND	0.50	11/01/20 15:13	
Chromium	ug/L	ND	1.0	11/02/20 17:08	
Cobalt	ug/L	ND	1.0	11/01/20 15:13	
Lead	ug/L	ND	1.0	11/01/20 15:13	
Molybdenum	ug/L	ND	1.0	11/01/20 15:13	
Selenium	ug/L	ND	1.0	11/02/20 17:08	
Thallium	ug/L	ND	1.0	11/01/20 15:13	

LABORATORY CONTROL SAMPLE: 2773034

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Antimony	ug/L	40	38.0	95	80-120	
Arsenic	ug/L	40	39.0	97	80-120	
Barium	ug/L	40	36.9	92	80-120	
Beryllium	ug/L	40	37.7	94	80-120	
Cadmium	ug/L	40	39.0	97	80-120	
Chromium	ug/L	40	39.3	98	80-120	
Cobalt	ug/L	40	39.5	99	80-120	
Lead	ug/L	40	36.9	92	80-120	
Molybdenum	ug/L	40	39.8	99	80-120	
Selenium	ug/L	40	38.4	96	80-120	
Thallium	ug/L	40	35.7	89	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773035 2773036

Parameter	Units	60350840001 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	40	40	36.8	37.4	90	92	75-125	2	20	
Arsenic	ug/L	ND	40	40	39.4	40.2	97	99	75-125	2	20	
Barium	ug/L	24.7	40	40	62.0	62.8	93	95	75-125	1	20	
Beryllium	ug/L	ND	40	40	28.9	29.2	72	73	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	34.6	35.3	86	88	75-125	2	20	
Chromium	ug/L	ND	40	40	33.7	34.3	82	84	75-125	2	20	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773035 2773036

Parameter	Units	60350840001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cobalt	ug/L	ND	40	40	45.5	45.7	111	112	75-125	1	20	
Lead	ug/L	ND	40	40	30.0	30.6	74	76	75-125	2	20	M1
Molybdenum	ug/L	13.0	40	40	60.4	61.2	119	120	75-125	1	20	
Selenium	ug/L	58.4	40	40	94.7	96.7	91	96	75-125	2	20	
Thallium	ug/L	ND	40	40	30.3	31.0	76	77	75-125	2	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773037 2773038

Parameter	Units	60350879002 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	40	40	37.9	37.9	94	95	75-125	0	20	
Arsenic	ug/L	ND	40	40	40.3	40.3	98	98	75-125	0	20	
Barium	ug/L	32.7	40	40	69.9	68.6	93	90	75-125	2	20	
Beryllium	ug/L	ND	40	40	34.4	34.8	86	87	75-125	1	20	
Cadmium	ug/L	ND	40	40	36.5	36.6	91	92	75-125	0	20	
Chromium	ug/L	ND	40	40	38.8	39.1	94	95	75-125	1	20	
Cobalt	ug/L	ND	40	40	41.9	41.6	104	104	75-125	1	20	
Lead	ug/L	ND	40	40	32.4	32.5	81	81	75-125	0	20	
Molybdenum	ug/L	8.3	40	40	53.4	53.5	113	113	75-125	0	20	
Selenium	ug/L	ND	40	40	39.8	40.5	92	94	75-125	2	20	
Thallium	ug/L	ND	40	40	31.9	32.1	80	80	75-125	0	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2773039 2773040

Parameter	Units	60350879003 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	40	40	37.5	37.4	93	93	75-125	0	20	
Arsenic	ug/L	ND	40	40	40.3	40.2	99	99	75-125	0	20	
Barium	ug/L	16.6	40	40	53.9	54.2	93	94	75-125	1	20	
Beryllium	ug/L	ND	40	40	28.5	28.7	71	72	75-125	1	20	M1
Cadmium	ug/L	ND	40	40	35.8	35.9	89	90	75-125	0	20	
Chromium	ug/L	ND	40	40	33.6	33.8	83	83	75-125	1	20	
Cobalt	ug/L	1.7	40	40	46.8	46.2	113	111	75-125	1	20	
Lead	ug/L	ND	40	40	29.5	29.9	74	75	75-125	1	20	M1
Molybdenum	ug/L	1.5	40	40	51.0	51.0	124	124	75-125	0	20	
Selenium	ug/L	ND	40	40	38.2	37.7	94	93	75-125	1	20	
Thallium	ug/L	ND	40	40	29.9	30.2	75	76	75-125	1	20	

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REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
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Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

QC Batch: 682625
QC Batch Method: SM 2540C
Analysis Method: SM 2540C
Analysis Description: 2540C Total Dissolved Solids
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350879003

METHOD BLANK: 2759317 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Dissolved Solids	mg/L	ND	5.0	10/14/20 08:57	

LABORATORY CONTROL SAMPLE: 2759318

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Dissolved Solids	mg/L	1000	1050	105	80-120	

SAMPLE DUPLICATE: 2759319

Parameter	Units	60350879003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	4830	4740	2	10	

SAMPLE DUPLICATE: 2759320

Parameter	Units	60350964013 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Dissolved Solids	mg/L	17200	18600	8	10	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

QC Batch: 685060
QC Batch Method: EPA 9056
Analysis Method: EPA 9056
Analysis Description: 9056 IC Anions
Laboratory: Pace Analytical Services - Kansas City
Associated Lab Samples: 60350879003

METHOD BLANK: 2769666 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/26/20 09:13	
Fluoride	mg/L	ND	0.20	10/26/20 09:13	
Sulfate	mg/L	ND	1.0	10/26/20 09:13	

METHOD BLANK: 2770399 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/27/20 09:06	
Fluoride	mg/L	ND	0.20	10/27/20 09:06	
Sulfate	mg/L	ND	1.0	10/27/20 09:06	

METHOD BLANK: 2771511 Matrix: Water
Associated Lab Samples: 60350879003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Chloride	mg/L	ND	1.0	10/28/20 09:04	
Fluoride	mg/L	ND	0.20	10/28/20 09:04	
Sulfate	mg/L	ND	1.0	10/28/20 09:04	

LABORATORY CONTROL SAMPLE: 2769667

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	5.0	99	80-120	
Fluoride	mg/L	2.5	2.5	100	80-120	
Sulfate	mg/L	5	5.2	104	80-120	

LABORATORY CONTROL SAMPLE: 2770400

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	98	80-120	
Fluoride	mg/L	2.5	2.6	103	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

LABORATORY CONTROL SAMPLE: 2771512

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chloride	mg/L	5	4.9	97	80-120	
Fluoride	mg/L	2.5	2.6	102	80-120	
Sulfate	mg/L	5	5.1	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769668 2769669

Parameter	Units	60350879002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	126	50	50	180	179	107	105	80-120	0	15	
Fluoride	mg/L	0.64	2.5	2.5	2.9	3.0	92	95	80-120	3	15	
Sulfate	mg/L	323	250	250	570	565	99	97	80-120	1	15	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2769671 2769672

Parameter	Units	60350879003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chloride	mg/L	21.0	10	10	31.9	32.7	109	117	80-120	2	15	
Fluoride	mg/L	0.22	2.5	2.5	2.1	2.1	77	75	80-120	2	15	M1
Sulfate	mg/L	2610	2500	2500	5210	5260	104	106	80-120	1	15	M1

SAMPLE DUPLICATE: 2769670

Parameter	Units	60350879002 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	126	122	4	15	
Fluoride	mg/L	0.64	0.64	1	15	
Sulfate	mg/L	323	310	4	15	

SAMPLE DUPLICATE: 2769673

Parameter	Units	60350879003 Result	Dup Result	RPD	Max RPD	Qualifiers
Chloride	mg/L	21.0	21.0	0	15	
Fluoride	mg/L	0.22	ND		15	
Sulfate	mg/L	2610	2740	5	15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

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.

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

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353680

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60350879003	**ASH-08-CCR**	EPA 3010	686072	EPA 6010	686255
60350879003	**ASH-08-CCR**	EPA 3010	686073	EPA 6020	686257
60350879003	**ASH-08-CCR**	EPA 7470	682721	EPA 7470	682799
60350879003	**ASH-08-CCR**	SM 2540C	682625		
60350879003	**ASH-08-CCR**	EPA 9056	685060		

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www.pacelabs.com

Sample Condition Upon Receipt
ESI Tech Spec Client

WO# : 60350879

60350879

Client Name: AEcom

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Xroads ☐ Client ☐ Other ☐

Tracking #: 1908 6736 0945 Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☐ No ☒ Seals intact: Yes ☐ No ☒

Packing Material: Bubble Wrap ☐ Bubble Bags ☐ Foam ☐ None ☐ Other ☒ Zplc

Thermometer Used: T299 **Type of Ice:** (Wet) Blue None

Cooler Temperature (°C): **As-read** 4.8 **Corr. Factor** +0.2 **Corrected** 5.0

Date and initials of person examining contents: 10/9/20 SK

Temperature should be above freezing to 6°C

Chain of Custody present:	☒Yes ☐No ☐N/A	
Chain of Custody relinquished:	☒Yes ☐No ☐N/A	
Samples arrived within holding time:	☒Yes ☐No ☐N/A	
Short Hold Time analyses (<72hr):	☐Yes ☒No ☐N/A	
Rush Turn Around Time requested:	☐Yes ☒No ☐N/A	
Sufficient volume:	☒Yes ☐No ☐N/A	
Correct containers used:	☒Yes ☐No ☐N/A	
Pace containers used:	☐Yes ☐No ☐N/A	
Containers intact:	☒Yes ☐No ☐N/A	
Unpreserved 5035A / TX1005/1006 soils frozen in 48hrs?	☐Yes ☐No ☒N/A	
Filtered volume received for dissolved tests?	☐Yes ☐No ☐N/A	
Sample labels match COC: Date / time / ID / analyses	☒Yes ☐No ☐N/A	
Samples contain multiple phases? Matrix: WT	☐Yes ☒No ☐N/A	
Containers requiring pH preservation in compliance? ☒Yes ☐No ☐N/A (HNO_3, H_2SO_4, HCl<2; NaOH>9 Sulfide, NaOH>10 Cyanide) (Exceptions: VOA, Micro, O&G, KS TPH, OK-DRO)		List sample IDs, volumes, lot #'s of preservative and the date/time added.
Cyanide water sample checks: Lead acetate strip turns dark? (Record only) Potassium iodide test strip turns blue/purple? (Preserve)	☐Yes ☐No ☐Yes ☐No	
Trip Blank present:	☐Yes ☐No ☒N/A	
Headspace in VOA vials (>6mm):	☐Yes ☐No ☒N/A	
Samples from USDA Regulated Area: State:	☐Yes ☐No ☒N/A	
Additional labels attached to 5035A / TX1005 vials in the field?	☐Yes ☐No ☒N/A	

Client Notification/ Resolution: Copy COC to Client? Y / N Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

Project Manager Review: _____ Date: _____

Temp Log: Record start and finish times when unpacking cooler, if >20 min, recheck sample temps.

Start:	Start:
End:	End:
Temp:	Temp:

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www.pacelabs.com

CHAIN-OF-CUSTODY / Analytical Request Document

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

Section A Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B Required Project Information:

Report To:	Vasanta Kalluri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	PRPA Rawhide CCR
Project Number:	

Section C Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

NPDES | GROUND WATER | DRINKING WATER

UST | RCRA | OTHER

Site Location STATE: CO

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BAT-10-CCR	WT	G	10/8/20	9:00	—	—		3	2		1						✓	✓	✓	✓	✓	✓		60350879
2	BAT-12-CCR	WT	G	10/8/20	11:15	—	—		7	4		3						✓	✓	✓	✓	✓	✓		MS/MSD collected at
3	ASH-08-CCR	WT	G	10/8/20	13:30	—	—		3	2		1						✓	✓	✓	✓	✓	✓		BAT-12
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	Jeff Dobkowski	10/8/20	16:00	Miller/Pace	10/9/20	0850
**B, Ca, Li						

SAMPLE CONDITIONS			
Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
5.0	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski

DATE Signed (MM/DD/YY): 10/08/2020

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

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Page: of

Section A Required Client Information:		**Section B** Required Project Information:		**Section C** Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone: (303) 740-2614	Fax:	Project Name:	PRPA Rawhide	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location ***STATE:*** CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Analysis Test Y/N	9056 Cl, F, SO4	6020 Total Metals*	6010 Total Metals**	7470 Total Mercury	2540C TDS	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WT	G	10/8/20	13:30	---	---		3	2		1							X	X	X	X	X		
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
*Be, Cr, Co, As, Se, Mo, Cd, Sb, Ba, Tl, Pb	See Original COC	10/8/20	16:00	See Original COC	10/9/20	8:50	
**B, Ca, Li							

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski / Revised by Brian Rothmeyer (11/2/2020)

SIGNATURE of SAMPLER: See Original COC **DATE Signed (MM/DD/YY):** 10/8/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Platte River Power Authority – Rawhide
DATA REVIEW CHECK

Data Package: 60353753
Sampling Event: October 8, 2020
Data Reviewer: Brian Rothmeyer — Date Completed: December 21, 2020
Peer Reviewer: Katie Abbott — Date Completed: January 10, 2021

This report contains the final results of the data validation conducted for the water samples collected October 8th, 2020. The data review was conducted in accordance with method requirements and laboratory limits using guidance from United States Environmental Protection Agency (USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-2017-001 (January 2017).

General Overall Assessment:

_____ Data are usable without qualification.
__X__ Data are usable with qualification (noted below).
_____ Some or all data are unusable for any purpose (detailed below).

Data Review Checklist

Review Parameter	Criteria	Criteria Met?		
Sample-specific Parameters	For each "No" response, list qualified data and bias direction in Table 1 or explain no qualification in comments.	Yes	No	NA
Chain of Custody, Sample Identification, & Sample Receipt	Samples were received intact and the cooler temperature was <6 degree Celsius upon arrival at the laboratory.	X		
Holding Times	The samples were analyzed within the method required holding times.	X		
Method Blanks (MB)	No target analytes reported in the associated MB. **Analyte** / **Concentration** **MB 2026011** Radium-228 / 1.05 ± 0.493 pCi/L ± – Plus or Minus pCi/L – Picocuries Per Liter MB – Method Blank		X[1]	
Quality Control Samples: Laboratory Control Sample (LCS)/ Laboratory Control Sample Duplicate (LCSD)	The LCS/LCSD recoveries were within the laboratory determined acceptance limits.	X		
Matrix Spike / Matrix Spike Duplicate (MS/MSD)	The recoveries and relative percent differences for the matrix spike and matrix spike duplicate analyses were within the laboratory-determined acceptance ranges.			X
Laboratory Duplicate	The laboratory duplicate samples were within the laboratory determined acceptance limits. The following concentration dependent criteria were used to evaluate laboratory duplicates: • The agreement between parent sample results and laboratory duplicate sample results were evaluated. The duplicate error ratios (DER) met the criterion of a DER ≤2.			X

<table>
<tr><th>Review Parameter</th><th>Criteria</th><th colspan="3">Criteria Met?</th></tr>
<tr><td>Sample-specific Parameters</td><td>For each “No” response, list qualified data and bias direction in Table 1 or explain no qualification in comments.</td><td>Yes</td><td>No</td><td>NA</td></tr>
<tr><td>Field Duplicate</td><td>The field duplicate sample results satisfied the evaluation criteria below:
• The agreement between parent sample results and field duplicate sample results were evaluated. The DER met the criterion of a DER ≤2.</td><td></td><td></td><td>X</td></tr>
<tr><td>Equipment Blanks</td><td>No target analytes reported in the associated equipment blank.
<table>
<tr><th>Analyte</th><th>Concentration</th></tr>
<tr><td colspan="2">60351403</td></tr>
<tr><td colspan="2">ERB-04-CCR</td></tr>
<tr><td>Radium-228</td><td>1.41 ± 0.584 pCi/L</td></tr>
<tr><td>Total Radium</td><td>1.53 ± 1.48 pCi/L</td></tr>
</table>
pCi/L – Picocuries Per Liter</td><td></td><td>X[2]</td><td></td></tr>
<tr><td>Detection Limits Mets</td><td>For radiochemical results if the associated uncertainty was greater than the reported result, the 2 sigma (σ) uncertainty multiplied by 1.65 was less than or equal to the specified detection limit.</td><td>X</td><td></td><td></td></tr>
<tr><td>Tracer and/or Carrier Recovery</td><td>The sample specific recoveries were within the laboratory limits.</td><td>X</td><td></td><td></td></tr>
<tr><td>Reporting</td><td>No reporting issues were found and further qualification was not considered necessary.</td><td>X</td><td></td><td></td></tr>
<tr><td>Package Completeness</td><td>No results were qualified as unusable and the data are 100% complete.</td><td>X</td><td></td><td></td></tr>
<tr><th colspan="5">Comments</th></tr>
<tr><td colspan="5">1 – The associated radium-228 result for sample ASH-08-CCR was reported at a concentration greater than the minimum detectable concentration (MDC) and reported at a concentration less than 5x the concentration of the blank contamination and was qualified as estimated (J+ bl) to reflect the potential high bias indicated by the blank contamination.

2 – The associated radium-228 and total radium results for sample ASH-08-CCR were reported at concentrations greater than the MDC and reported at concentrations less than 5x the concentration of the blank contamination and were qualified as estimated (J+ be) to reflect the potential high bias indicated by the blank contamination.</td></tr>
</table>

< – Less Than
pCi/L – Picocuries Per Liter
bl – Laboratory blank Contamination
LCS – Laboratory Control Sample
MDC – Minimum Detectable Concentration
≤ – Less Than or Equal To
± – Plus or Minus/High or Low Bias
DER – Duplicate Error Ratio
LCSD – Laboratory Control Sample Duplicate
MS/MSD – Matrix Spike/Matrix Spike Duplicate
σ – Sigma (Uncertainty)
be – Equipment Blank Contamination
J – Estimated
MB – Method Blank
NA – Not Applicable

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

November 06, 2020

Vasanta Kalluri
AECOM
6200 South Quebec Street
Greenwood Village, CO 80111

RE: Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

Dear Vasanta Kalluri:

Enclosed are the analytical results for sample(s) received by the laboratory on October 09, 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 - Greensburg

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

Sincerely,

Heather Wilson
heather.wilson@pacelabs.com
1(913)563-1407
Project Manager

Enclosures

cc: Ann Cinabro, AECOM
Jeremy Hurshman, AECOM
Brian Rothmeyer, AECOM

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

CERTIFICATIONS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

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
Florida: Cert E871149 SEKS WET
Guam Certification
Hawaii Certification
Idaho Certification
Illinois Certification
Indiana Certification
Iowa Certification #: 391
Kansas/TNI Certification #: E-10358
Kentucky Certification #: KY90133
KY WW Permit #: KY0098221
KY WW Permit #: KY0000221
Louisiana DHH/TNI Certification #: LA180012
Louisiana DEQ/TNI Certification #: 4086
Maine Certification #: 2017020
Maryland Certification #: 308
Massachusetts Certification #: M-PA1457
Michigan/PADEP Certification #: 9991
Missouri Certification #: 235
Montana Certification #: Cert0082
Nebraska Certification #: NE-OS-29-14
Nevada Certification #: PA014572018-1
New Hampshire/TNI Certification #: 297617
New Jersey/TNI Certification #: PA051
New Mexico Certification #: PA01457
New York/TNI Certification #: 10888
North Carolina Certification #: 42706
North Dakota Certification #: R-190
Ohio EPA Rad Approval: #41249
Oregon/TNI Certification #: PA200002-010
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, LLC
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SAMPLE SUMMARY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60351176007	**ASH-08-CCR**	Water	10/08/20 13:30	10/09/20 09:15

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60351176007	**ASH-08-CCR**	EPA 903.1	MK1	1	PASI-PA
		EPA 904.0	VAL	1	PASI-PA
		Total Radium Calculation	CMC	1	PASI-PA

PASI-PA = Pace Analytical Services - Greensburg

Pace Analytical Services, LLC
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ANALYTICAL RESULTS - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

Sample: ASH-08-CCR **Lab ID: 60351176007** Collected: 10/08/20 13:30 Received: 10/09/20 09:15 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 903.1	**0.615 ± 0.523 (0.735) C:NA T:85%**	pCi/L	10/27/20 14:08	13982-63-3	
	Pace Analytical Services - Greensburg					
Radium-228	EPA 904.0	**1.36 ± 0.607 (1.01) C:68% T:70%**	pCi/L	10/30/20 11:59	15262-20-1	
	Pace Analytical Services - Greensburg					
Total Radium	Total Radium Calculation	**1.98 ± 1.13 (1.75)**	pCi/L	11/01/20 12:49	7440-14-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

QC Batch: 419061
QC Batch Method: EPA 904.0
Analysis Method: EPA 904.0
Analysis Description: 904.0 Radium 228
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351176007

METHOD BLANK: 2026011 Matrix: Water
Associated Lab Samples: 60351176007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-228	0.418 ± 0.455 (0.950) C:74% T:69%	pCi/L	10/30/20 11:59	
Radium-228	1.05 ± 0.493 (0.827) C:68% T:80%	pCi/L	10/26/20 15:15	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL - RADIOCHEMISTRY

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

QC Batch: 419060
QC Batch Method: EPA 903.1
Analysis Method: EPA 903.1
Analysis Description: 903.1 Radium-226
Laboratory: Pace Analytical Services - Greensburg
Associated Lab Samples: 60351176007

METHOD BLANK: 2026010 Matrix: Water
Associated Lab Samples: 60351176007

Parameter	Act ± Unc (MDC) Carr Trac	Units	Analyzed	Qualifiers
Radium-226	0.319 ± 0.370 (0.598) C:NA T:92%	pCi/L	10/27/20 13:52	

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

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALIFIERS

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

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.

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.

Pace Analytical Services, LLC
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 60630103.200.0 PRPA CCR
Pace Project No.: 60353753

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60351176007	**ASH-08-CCR**	EPA 903.1	419060		
60351176007	**ASH-08-CCR**	EPA 904.0	419061		
60351176007	**ASH-08-CCR**	Total Radium Calculation	421105		

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: 1 of 1

Section A — Required Client Information:

Company:	AECOM
Address:	6200 South Quebec St
	Greenwood Village, CO 80111
Email To:	brian.rothmeyer@aecom.com
Phone: (303) 740-2614	Fax:
Requested Due Date/TAT:	

Section B — Required Project Information:

Report To:	Vasanta Kailuri
Copy To:	Brian Rothmeyer
Purchase Order No.:	
Project Name:	rev
Project Number:	

Section C — Invoice Information:

Attention:	Accounts Payable
Company Name:	AECOM
Address:	Same as Section A
Pace Quote Reference:	42700
Pace Project Manager:	Heather Wilson
Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☐ OTHER

Site Location STATE: CO

Section D — Required Client Information

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	BAT-09-CCR	WT	G	10/7/20	9:30	—	—		2			2						✓	✓	✓	✓		
2	ERB-02	WT	G	10/7/20	11:00	—	—		2			2						✓	✓	✓	✓		
3	BAT-10-CCR	WT	G	10/8/20	9:00	—	—		2			2						✓	✓	✓	✓		
4	BAT-12-CCR	WT	G	10/8/20	11:15	—	—		2			2						✓	✓	✓	✓		MS/MSD collected at BAT-12
5	ASH-03-CCR	WT	G	10/8/20	13:30	—	—		2			2						✓	✓	✓	✓		
6																							
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	Jeff Dobkowski	10/8/20	16:00		10/9/20	0815	- N Y N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski

SIGNATURE of SAMPLER: Jeff Dobkowski

DATE Signed (MM/DD/YY): 10/08/2020

Temp in °C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Pittsburgh Lab Sample Condition Upon Receipt

Pace Analytical

Client Name: Pace KS Project #

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

Label
LIMS Login

Tracking #: 140367361080

Custody Seal on Cooler/Box Present: ☑ yes ☐ no Seals intact: ☑ yes ☐ no

Thermometer Used – Type of Ice: Wet Blue (None)

Cooler Temperature Observed Temp – °C Correction Factor: – °C Final Temp: – °C

Temp should be above freezing to 6°C

pH paper Lot# 10304401 Date and initials of person examining contents: JSM 10/10/2020

Comments:	Yes	No	N/A	
Chain of Custody Present:	✓			1.
Chain of Custody Filled Out:	✓			2.
Chain of Custody Relinquished:	✓			3.
Sampler Name & Signature on COC:	✓			4.
Sample Labels match COC: -Includes date/time/ID Matrix: WT	✓			5.
Samples Arrived within Hold Time:	✓			6.
Short Hold Time Analysis (<72hr remaining):		✓		7.
Rush Turn Around Time Requested:		✓		8.
Sufficient Volume:	✓			9.
Correct Containers Used: -Pace Containers Used:	✓ ✓			10.
Containers Intact:	✓			11.
Orthophosphate field filtered			✓	12.
Hex Cr Aqueous sample field filtered			✓	13.
Organic Samples checked for dechlorination:			✓	14.
Filtered volume received for Dissolved tests			✓	15.
All containers have been checked for preservation. exceptions: VOA, coliform, TOC, O&G, Phenolics, Radon, Non-aqueous matrix	✓			16. pH<2
All containers meet method preservation requirements.	✓			Initial when completed: JSM Date/time of preservation: Lot # of added preservative:
Headspace in VOA Vials (>6mm):			✓	17.
Trip Blank Present:			✓	18.
Trip Blank Custody Seals Present			✓	
Rad Samples Screened < 0.5 mrem/hr	✓			Initial when completed: JSM Date: 10/10/2020

Client Notification/ Resolution:

Person Contacted: Date/Time: Contacted By:

Comments/ Resolution:

☐ **A check in this box indicates that additional information has been stored in ereports.**

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

***PM review** is documented electronically in LIMS. When the Project Manager closes the SRF Review schedule in LIMS. The review is in the Status section of the Workorder Edit Screen.

CHAIN-OF-CUSTODY / Analytical Request Document

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

REVISED COC

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Page: of

Section A Required Client Information:		**Section B** Required Project Information:		**Section C** Invoice Information:	
Company:	AECOM	Report To:	Vasanta Kalluri	Attention:	Accounts Payable
Address:	6200 South Quebec St	Copy To:	Brian Rothmeyer	Company Name:	AECOM
	Greenwood Village, CO 80111			Address:	Same as Section A
Email To:	brian.rothmeyer@aecom.com	Purchase Order No.:		Pace Quote Reference:	42700
Phone:	(303) 740-2614 Fax:	Project Name:	PRPA Rawhide	Pace Project Manager:	Heather Wilson
Requested Due Date/TAT:		Project Number:		Pace Profile #:	11033, 3

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER

☐ UST ☐ RCRA ☐ OTHER _____

Site Location ***STATE:*** CO

Requested Analysis Filtered (Y/N)

Section D Required Client Information

Valid Matrix Codes

MATRIX	CODE
DRINKING WATER	DW
WATER	WT
WASTE WATER	WW
PRODUCT	P
SOIL/SOLID	SL
OIL	OL
WIPE	WP
AIR	AR
OTHER	OT
TISSUE	TS

SAMPLE ID
(A-Z, 0-9 / ,-)
Sample IDs MUST BE UNIQUE

ITEM #	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED: COMPOSITE START DATE	COLLECTED: COMPOSITE START TIME	COLLECTED: COMPOSITE END/GRAB DATE	COLLECTED: COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	Preservatives: H_2SO_4	Preservatives: HNO_3	Preservatives: HCl	Preservatives: NaOH	Preservatives: $Na_2S_2O_3$	Preservatives: Methanol	Preservatives: Other	Analysis Test Y/N	Radium-226	Radium-228	Total Radium	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D.
1	WT	G	10/8/20	13:30	---	---		2		2								X	X	X		
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	See Original COC	10/8/20	16:00	See Original COC	10/9/20	9:15	

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeff Dobkowski / Revised by Brian Rothmeyer (11/2/2020)

SIGNATURE of SAMPLER: See Original COC **DATE Signed (MM/DD/YY):** 10/8/20

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

Quality Control Sample Performance Assessment

Test: Ra-226
Analyst: MK1
Date: 10/2/2020
Batch ID: 56814
Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026010
MB concentration:	0.319
M/B Counting Uncertainty:	0.368
MB MDC:	0.598
MB Numerical Performance Indicator:	1.70
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56814	LCSD56814
Count Date:	10/27/2020	
Spike I.D.:	20-032	
Spike Concentration (pCi/mL):	32.182	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.656	
Target Conc. (pCi/L, g, F):	4.902	
Uncertainty (Calculated):	0.230	
Result (pCi/L, g, F):	5.792	
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	1.192	
Numerical Performance Indicator:	1.44	
Percent Recovery:	118.14%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	73%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/8/2020	10/8/2020
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Spike I.D.:	20-032	20-032
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	32.183	32.183
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.660	0.659
MS Target Conc.(pCi/L, g, F):	9.751	9.773
MSD Aliquot (L, g, F):	0.653	0.654
MSD Target Conc. (pCi/L, g, F):	9.855	9.840
MS Spike Uncertainty (calculated):	0.458	0.459
MSD Spike Uncertainty (calculated):	0.463	0.462
Sample Result:	0.339	0.119
Sample Result Counting Uncertainty (pCi/L, g, F):	0.367	0.438
Sample Matrix Spike Result:	8.724	10.220
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
Sample Matrix Spike Duplicate Result:	11.463	9.723
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.647	1.330
MS Numerical Performance Indicator:	-1.911	0.406
MSD Numerical Performance Indicator:	1.422	-0.313
MS Percent Recovery:	86.00%	103.36%
MSD Percent Recovery:	112.88%	97.61%
MS Status vs Numerical Indicator:	N/A	N/A
MSD Status vs Numerical Indicator:	N/A	N/A
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	136%	136%
MS/MSD Lower % Recovery Limits:	71%	71%

Duplicate Sample Assessment		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Sample I.D.:		
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result Counting Uncertainty (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Sample Matrix Spike Result:	8.724	10.220
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	1.270	1.450
Sample Matrix Spike Duplicate Result:	11.463	9.723
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.647	1.330
Duplicate Numerical Performance Indicator:	-2.581	0.495
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	27.03%	5.72%
MS/ MSD Duplicate Status vs Numerical Indicator:	N/A	N/A
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	32%	32%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the RL.

Comments:

10/28/2020

Quality Control Sample Performance Assessment

Pace Analytical
www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	10/22/2020
Worklist:	56815
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026011
MB concentration:	1.053
M/B 2 Sigma CSU:	0.493
MB MDC:	0.827
MB Numerical Performance Indicator:	4.19
MB Status vs Numerical Indicator:	Fail*
MB Status vs. MDC:	Fail*

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56815	LCSD56815
Count Date:	10/26/2020	
Spike I.D.:	20-030	
Decay Corrected Spike Concentration (pCi/mL):	37.878	
Volume Used (mL):	0.10	
Aliquot Volume (L, g, F):	0.818	
Target Conc. (pCi/L, g, F):	4.632	
Uncertainty (Calculated):	0.227	
Result (pCi/L, g, F):	5.132	
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	1.196	
Numerical Performance Indicator:	0.81	
Percent Recovery:	110.80%	
Status vs Numerical Indicator:	N/A	
Status vs Recovery:	Pass	
Upper % Recovery Limits:	135%	
Lower % Recovery Limits:	60%	

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:	10/8/2020	10/8/2020
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Spike I.D.:	20-030	20-030
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	38.107	38.107
Spike Volume Used in MS (mL):	0.20	0.20
Spike Volume Used in MSD (mL):	0.20	0.20
MS Aliquot (L, g, F):	0.807	0.810
MS Target Conc.(pCi/L, g, F):	9.447	9.407
MSD Aliquot (L, g, F):	0.811	0.818
MSD Target Conc. (pCi/L, g, F):	9.402	9.317
MS Spike Uncertainty (calculated):	0.463	0.461
MSD Spike Uncertainty (calculated):	0.461	0.457
Sample Result:	2.878	2.094
Sample Result 2 Sigma CSU (pCi/L, g, F):	1.119	0.907
Sample Matrix Spike Result:	10.637	9.649
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.260	2.301
Sample Matrix Spike Duplicate Result:	10.290	9.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.197	2.145
MS Numerical Performance Indicator:	-1.291	-1.443
MSD Numerical Performance Indicator:	-1.555	-1.452
MS Percent Recovery:	82.13%	80.31%
MSD Percent Recovery:	78.83%	81.13%
MS Status vs Numerical Indicator:	Pass	Pass
MSD Status vs Numerical Indicator:	Pass	Pass
MS Status vs Recovery:	Pass	Pass
MSD Status vs Recovery:	Pass	Pass
MS/MSD Upper % Recovery Limits:	135%	135%
MS/MSD Lower % Recovery Limits:	60%	60%

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.	60351179003	60351176004
Sample MS I.D.	60351179004	60351176005
Sample MSD I.D.	60351179005	60351176006
Sample Matrix Spike Result:	10.637	9.649
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):	2.260	2.301
Sample Matrix Spike Duplicate Result:	10.290	9.653
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):	2.197	2.145
Duplicate Numerical Performance Indicator:	0.216	-0.003
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:	4.10%	1.01%
MS/ MSD Duplicate Status vs Numerical Indicator:	Pass	Pass
MS/ MSD Duplicate Status vs RPD:	Pass	Pass
% RPD Limit:	36%	36%

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:
*If the lowest activity sample in this batch is greater than ten times the blank value, the blank is acceptable; otherwise this batch must be re-prepped.

10/27/2020

Quality Control Sample Performance Assessment

Pace Analytical™
www.pacelabs.com

Test:	Ra-228
Analyst:	VAL
Date:	10/22/2020
Worklist:	56815
Matrix:	WT

Analyst Must Manually Enter All Fields Highlighted in Yellow.

Method Blank Assessment	
MB Sample ID	2026011
MB concentration:	0.418
M/B 2 Sigma CSU:	0.455
MB MDC:	0.950
MB Numerical Performance Indicator:	1.80
MB Status vs Numerical Indicator:	Pass
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment	LCSD (Y or N)?	N
	LCS56815	LCSD56815
Count Date:	#N/A	#N/A
Spike I.D.:	#N/A	#N/A
Decay Corrected Spike Concentration (pCi/mL):	#N/A	#N/A
Volume Used (mL):		#N/A
Aliquot Volume (L, g, F):	#N/A	#N/A
Target Conc. (pCi/L, g, F):	#N/A	#N/A
Uncertainty (Calculated):	#N/A	#N/A
Result (pCi/L, g, F):	#N/A	#N/A
LCS/LCSD 2 Sigma CSU (pCi/L, g, F):	#N/A	
Numerical Performance Indicator:	#N/A	#N/A
Percent Recovery:	#N/A	#N/A
Status vs Numerical Indicator:	#N/A	#N/A
Status vs Recovery:	#N/A	#N/A
Upper % Recovery Limits:	#N/A	#N/A
Lower % Recovery Limits:	#N/A	#N/A

Sample Matrix Spike Control Assessment	MS/MSD 1	MS/MSD 2
Sample Collection Date:		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Spike I.D.:		
MS/MSD Decay Corrected Spike Concentration (pCi/mL):		
Spike Volume Used in MS (mL):		
Spike Volume Used in MSD (mL):		
MS Aliquot (L, g, F):		
MS Target Conc.(pCi/L, g, F):		
MSD Aliquot (L, g, F):		
MSD Target Conc. (pCi/L, g, F):		
MS Spike Uncertainty (calculated):		
MSD Spike Uncertainty (calculated):		
Sample Result:		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
MS Numerical Performance Indicator:		
MSD Numerical Performance Indicator:		
MS Percent Recovery:		
MSD Percent Recovery:		
MS Status vs Numerical Indicator:		
MSD Status vs Numerical Indicator:		
MS Status vs Recovery:		
MSD Status vs Recovery:		
MS/MSD Upper % Recovery Limits:		
MS/MSD Lower % Recovery Limits:		

Duplicate Sample Assessment		
Sample I.D.:		Enter Duplicate sample IDs if other than LCS/LCSD in the space below.
Duplicate Sample I.D.		
Sample Result (pCi/L, g, F):		
Sample Result 2 Sigma CSU (pCi/L, g, F):		
Sample Duplicate Result (pCi/L, g, F):		
Sample Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Are sample and/or duplicate results below RL?	See Below ##	
Duplicate Numerical Performance Indicator:		
Duplicate RPD:		
Duplicate Status vs Numerical Indicator:		
Duplicate Status vs RPD:		
% RPD Limit:		

Matrix Spike/Matrix Spike Duplicate Sample Assessment		
Sample I.D.		
Sample MS I.D.		
Sample MSD I.D.		
Sample Matrix Spike Result:		
Matrix Spike Result 2 Sigma CSU (pCi/L, g, F):		
Sample Matrix Spike Duplicate Result:		
Matrix Spike Duplicate Result 2 Sigma CSU (pCi/L, g, F):		
Duplicate Numerical Performance Indicator:		
(Based on the Percent Recoveries) MS/ MSD Duplicate RPD:		
MS/ MSD Duplicate Status vs Numerical Indicator:		
MS/ MSD Duplicate Status vs RPD:		
% RPD Limit:		

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

#N/A

Appendix C

Statistical Analysis Results

1				**Background Statistics for Data Sets with Non-Detects**								
2		**User Selected Options**										
3		Date/Time of Computation		ProUCL 5.11/27/2020 11:02:24 AM								
4		From File		Ash Landfill ProUCL Input 2019_a.xls								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		Different or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	**B**											
12												
13	**General Statistics**											
14				Total Number of Observations		17			Number of Distinct Observations			16
15				Minimum		0.283			First Quartile			0.45
16				Second Largest		0.58			Median			0.471
17				Maximum		0.63			Third Quartile			0.5
18				Mean		0.457			SD			0.0984
19				Coefficient of Variation		0.215			Skewness			-0.488
20				Mean of logged Data		-0.808			SD of logged Data			0.236
21												
22				**Critical Values for Background Threshold Values (BTVs)**								
23				Tolerance Factor K (For UTL)		2.486			d2max (for USL)			2.475
24												
25				**Normal GOF Test**								
26				Shapiro Wilk Test Statistic		0.91			**Shapiro Wilk GOF Test**			
27				5% Shapiro Wilk Critical Value		0.892			Data appear Normal at 5% Significance Level			
28				Lilliefors Test Statistic		0.237			**Lilliefors GOF Test**			
29				5% Lilliefors Critical Value		0.207			Data Not Normal at 5% Significance Level			
30				**Data appear Approximate Normal at 5% Significance Level**								
31												
32				**Background Statistics Assuming Normal Distribution**								
33				95% UTL with 95% Coverage		0.702			90% Percentile (z)			0.583
34				95% UPL (t)		0.634			95% Percentile (z)			0.619
35				95% USL		0.701			99% Percentile (z)			0.686
36												
37				**Gamma GOF Test**								
38				A-D Test Statistic		1.027			**Anderson-Darling Gamma GOF Test**			
39				5% A-D Critical Value		0.738			Data Not Gamma Distributed at 5% Significance Level			
40				K-S Test Statistic		0.267			**Kolmogorov-Smirnov Gamma GOF Test**			
41				5% K-S Critical Value		0.209			Data Not Gamma Distributed at 5% Significance Level			
42				**Data Not Gamma Distributed at 5% Significance Level**								
43												
44				**Gamma Statistics**								
45				k hat (MLE)		20.47			k star (bias corrected MLE)			16.9
46				Theta hat (MLE)		0.0223			Theta star (bias corrected MLE)			0.027
47				nu hat (MLE)		696			nu star (bias corrected)			574.5
48				MLE Mean (bias corrected)		0.457			MLE Sd (bias corrected)			0.111
49												
50				**Background Statistics Assuming Gamma Distribution**								
51				95% Wilson Hilferty (WH) Approx. Gamma UPL		0.661			90% Percentile			0.604
52				95% Hawkins Wixley (HW) Approx. Gamma UPL		0.666			95% Percentile			0.654
53				95% WH Approx. Gamma UTL with 95% Coverage		0.757			99% Percentile			0.754
54				95% HW Approx. Gamma UTL with 95% Coverage		0.767						

55					95% WH USL	0.756					95% HW USL	0.765
56												
57					**Lognormal GOF Test**							
58					Shapiro Wilk Test Statistic	0.865	**Shapiro Wilk Lognormal GOF Test**					
59					5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level					
60					Lilliefors Test Statistic	0.281	**Lilliefors Lognormal GOF Test**					
61					5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level					
62					**Data Not Lognormal at 5% Significance Level**							
63												
64					**Background Statistics assuming Lognormal Distribution**							
65					95% UTL with 95% Coverage	0.802					90% Percentile (z)	0.603
66					95% UPL (t)	0.681					95% Percentile (z)	0.658
67					95% USL	0.8					99% Percentile (z)	0.772
68												
69					**Nonparametric Distribution Free Background Statistics**							
70					**Data appear Approximate Normal at 5% Significance Level**							
71												
72					**Nonparametric Upper Limits for Background Threshold Values**							
73					Order of Statistic, r	17					95% UTL with 95% Coverage	0.63
74					Approx, f used to compute achieved CC	0.895					Approximate Actual Confidence Coefficient achieved by UTL	0.582
75											Approximate Sample Size needed to achieve specified CC	59
76					95% Percentile Bootstrap UTL with 95% Coverage	0.63					95% BCA Bootstrap UTL with 95% Coverage	0.63
77					95% UPL	0.63					90% Percentile	0.556
78					90% Chebyshev UPL	0.761					95% Percentile	0.59
79					95% Chebyshev UPL	0.898					99% Percentile	0.622
80					95% USL	0.63						
81												
82					Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.							
83					Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers							
84					and consists of observations collected from clean unimpacted locations.							
85					The use of USL tends to provide a balance between false positives and false negatives provided the data							
86					represents a background data set and when many onsite observations need to be compared with the BTV.							
87												
88	**Ca**											
89												
90	**General Statistics**											
91					Total Number of Observations	17					Number of Distinct Observations	15
92					Minimum	26.7					First Quartile	320
93					Second Largest	375					Median	346
94					Maximum	380					Third Quartile	363
95					Mean	276.9					SD	143.5
96					Coefficient of Variation	0.518					Skewness	-1.326
97					Mean of logged Data	5.266					SD of logged Data	1.118
98												
99					**Critical Values for Background Threshold Values (BTVs)**							
100					Tolerance Factor K (For UTL)	2.486					d2max (for USL)	2.475
101												
102					**Normal GOF Test**							
103					Shapiro Wilk Test Statistic	0.63	**Shapiro Wilk GOF Test**					
104					5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level					
105					Lilliefors Test Statistic	0.383	**Lilliefors GOF Test**					
106					5% Lilliefors Critical Value	0.207	Data Not Normal at 5% Significance Level					
107					**Data Not Normal at 5% Significance Level**							
108												

109	**Background Statistics Assuming Normal Distribution**											
110				95% UTL with	95% Coverage	633.7				90% Percentile (z)		460.9
111					95% UPL (t)	534.8				95% Percentile (z)		513
112					95% USL	632.1				99% Percentile (z)		610.8
113												
114	**Gamma GOF Test**											
115					A-D Test Statistic	3.686	**Anderson-Darling Gamma GOF Test**					
116					5% A-D Critical Value	0.755	Data Not Gamma Distributed at 5% Significance Level					
117					K-S Test Statistic	0.439	**Kolmogorov-Smirnov Gamma GOF Test**					
118					5% K-S Critical Value	0.213	Data Not Gamma Distributed at 5% Significance Level					
119	**Data Not Gamma Distributed at 5% Significance Level**											
120												
121	**Gamma Statistics**											
122					k hat (MLE)	1.543				k star (bias corrected MLE)		1.31
123					Theta hat (MLE)	179.5				Theta star (bias corrected MLE)		211.4
124					nu hat (MLE)	52.46				nu star (bias corrected)		44.53
125					MLE Mean (bias corrected)	276.9				MLE Sd (bias corrected)		242
126												
127	**Background Statistics Assuming Gamma Distribution**											
128				95% Wilson Hilferty (WH) Approx. Gamma UPL		806				90% Percentile		596.6
129				95% Hawkins Wixley (HW) Approx. Gamma UPL		891.6				95% Percentile		755.2
130				95% WH Approx. Gamma UTL with	95% Coverage	1168				99% Percentile		1117
131				95% HW Approx. Gamma UTL with	95% Coverage	1369						
132					95% WH USL	1161				95% HW USL		1360
133												
134	**Lognormal GOF Test**											
135					Shapiro Wilk Test Statistic	0.572	**Shapiro Wilk Lognormal GOF Test**					
136					5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level					
137					Lilliefors Test Statistic	0.438	**Lilliefors Lognormal GOF Test**					
138					5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level					
139	**Data Not Lognormal at 5% Significance Level**											
140												
141	**Background Statistics assuming Lognormal Distribution**											
142				95% UTL with	95% Coverage	3121				90% Percentile (z)		811.7
143					95% UPL (t)	1444				95% Percentile (z)		1219
144					95% USL	3083				99% Percentile (z)		2611
145												
146	**Nonparametric Distribution Free Background Statistics**											
147	**Data do not follow a Discernible Distribution (0.05)**											
148												
149	**Nonparametric Upper Limits for Background Threshold Values**											
150					Order of Statistic, r	17				95% UTL with	95% Coverage	380
151					Approx, f used to compute achieved CC	0.895				Approximate Actual Confidence Coefficient achieved by UTL		0.582
152										Approximate Sample Size needed to achieve specified CC		59
153				95% Percentile Bootstrap UTL with	95% Coverage	380				95% BCA Bootstrap UTL with	95% Coverage	380
154					95% UPL	380				90% Percentile		372
155					90% Chebyshev UPL	720				95% Percentile		376
156					95% Chebyshev UPL	920.6				99% Percentile		379.2
157					95% USL	380						
158												
159	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
160	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
161	and consists of observations collected from clean unimpacted locations.											
162	The use of USL tends to provide a balance between false positives and false negatives provided the data											

	A	B	C	D	E	F	G	H	I	J	K	L
163	represents a background data set and when many onsite observations need to be compared with the BTV.											
164												
165	**CI**											
166												
167	**General Statistics**											
168					Total Number of Observations	15			Number of Distinct Observations			12
169									Number of Missing Observations			1
170					Minimum	7.8			First Quartile			19.2
171					Second Largest	25			Median			20.2
172					Maximum	29			Third Quartile			24.5
173					Mean	19.63			SD			6.438
174					Coefficient of Variation	0.328			Skewness			-0.899
175					Mean of logged Data	2.907			SD of logged Data			0.424
176												
177	**Critical Values for Background Threshold Values (BTVs)**											
178					Tolerance Factor K (For UTL)	2.566			d2max (for USL)			2.409
179												
180	**Normal GOF Test**											
181					Shapiro Wilk Test Statistic	0.867			**Shapiro Wilk GOF Test**			
182					5% Shapiro Wilk Critical Value	0.881			Data Not Normal at 5% Significance Level			
183					Lilliefors Test Statistic	0.261			**Lilliefors GOF Test**			
184					5% Lilliefors Critical Value	0.22			Data Not Normal at 5% Significance Level			
185	**Data Not Normal at 5% Significance Level**											
186												
187	**Background Statistics Assuming Normal Distribution**											
188					95% UTL with 95% Coverage	36.15			90% Percentile (z)			27.88
189					95% UPL (t)	31.34			95% Percentile (z)			30.22
190					95% USL	35.14			99% Percentile (z)			34.61
191												
192	**Gamma GOF Test**											
193					A-D Test Statistic	1.37			**Anderson-Darling Gamma GOF Test**			
194					5% A-D Critical Value	0.738			Data Not Gamma Distributed at 5% Significance Level			
195					K-S Test Statistic	0.314			**Kolmogorov-Smirnov Gamma GOF Test**			
196					5% K-S Critical Value	0.222			Data Not Gamma Distributed at 5% Significance Level			
197	**Data Not Gamma Distributed at 5% Significance Level**											
198												
199	**Gamma Statistics**											
200					k hat (MLE)	7.279			k star (bias corrected MLE)			5.868
201					Theta hat (MLE)	2.697			Theta star (bias corrected MLE)			3.346
202					nu hat (MLE)	218.4			nu star (bias corrected)			176
203					MLE Mean (bias corrected)	19.63			MLE Sd (bias corrected)			8.105
204												
205	**Background Statistics Assuming Gamma Distribution**											
206					95% Wilson Hilferty (WH) Approx. Gamma UPL	35.46			90% Percentile			30.47
207					95% Hawkins Wixley (HW) Approx. Gamma UPL	36.29			95% Percentile			34.58
208					95% WH Approx. Gamma UTL with 95% Coverage	44.47			99% Percentile			43.2
209					95% HW Approx. Gamma UTL with 95% Coverage	46.31						
210					95% WH USL	42.46			95% HW USL			44.05
211												
212	**Lognormal GOF Test**											
213					Shapiro Wilk Test Statistic	0.768			**Shapiro Wilk Lognormal GOF Test**			
214					5% Shapiro Wilk Critical Value	0.881			Data Not Lognormal at 5% Significance Level			
215					Lilliefors Test Statistic	0.335			**Lilliefors Lognormal GOF Test**			
216					5% Lilliefors Critical Value	0.22			Data Not Lognormal at 5% Significance Level			

217	**Data Not Lognormal at 5% Significance Level**											
218												
219	**Background Statistics assuming Lognormal Distribution**											
220					95% UTL with 95% Coverage	54.3			90% Percentile (z)	31.5		
221					95% UPL (t)	39.57			95% Percentile (z)	36.75		
222					95% USL	50.81			99% Percentile (z)	49.06		
223												
224	**Nonparametric Distribution Free Background Statistics**											
225	**Data do not follow a Discernible Distribution (0.05)**											
226												
227	**Nonparametric Upper Limits for Background Threshold Values**											
228					Order of Statistic, r	15			95% UTL with 95% Coverage	29		
229					Approx, f used to compute achieved CC	0.789			Approximate Actual Confidence Coefficient achieved by UTL	0.537		
230									Approximate Sample Size needed to achieve specified CC	59		
231					95% Percentile Bootstrap UTL with 95% Coverage	29			95% BCA Bootstrap UTL with 95% Coverage	29		
232					95% UPL	29			90% Percentile	25		
233					90% Chebyshev UPL	39.58			95% Percentile	26.2		
234					95% Chebyshev UPL	48.62			99% Percentile	28.44		
235					95% USL	29						
236												
237	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
238	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
239	and consists of observations collected from clean unimpacted locations.											
240	The use of USL tends to provide a balance between false positives and false negatives provided the data											
241	represents a background data set and when many onsite observations need to be compared with the BTV.											
242												
243	F											
244												
245	**General Statistics**											
246					Total Number of Observations	17			Number of Missing Observations	0		
247					Number of Distinct Observations	12						
248					Number of Detects	12			Number of Non-Detects	5		
249					Number of Distinct Detects	12			Number of Distinct Non-Detects	1		
250					Minimum Detect	0.12			Minimum Non-Detect	0.2		
251					Maximum Detect	1.65			Maximum Non-Detect	0.2		
252					Variance Detected	0.172			Percent Non-Detects	29.41%		
253					Mean Detected	0.593			SD Detected	0.415		
254					Mean of Detected Logged Data	-0.743			SD of Detected Logged Data	0.719		
255												
256	**Critical Values for Background Threshold Values (BTVs)**											
257					Tolerance Factor K (For UTL)	2.486			d2max (for USL)	2.475		
258												
259	**Normal GOF Test on Detects Only**											
260					Shapiro Wilk Test Statistic	0.866			**Shapiro Wilk GOF Test**			
261					5% Shapiro Wilk Critical Value	0.859			Detected Data appear Normal at 5% Significance Level			
262					Lilliefors Test Statistic	0.193			**Lilliefors GOF Test**			
263					5% Lilliefors Critical Value	0.243			Detected Data appear Normal at 5% Significance Level			
264	**Detected Data appear Normal at 5% Significance Level**											
265												
266	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
267					KM Mean	0.454			KM SD	0.397		
268					95% UTL95% Coverage	1.442			95% KM UPL (t)	1.168		
269					90% KM Percentile (z)	0.963			95% KM Percentile (z)	1.107		
270					99% KM Percentile (z)	1.378			95% KM USL	1.437		

271												
272	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
273					Mean	0.448				SD		0.415
274					95% UTL95% Coverage	1.479				95% UPL (t)		1.193
275					90% Percentile (z)	0.98				95% Percentile (z)		1.13
276					99% Percentile (z)	1.413				95% USL		1.474
277	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
278												
279	**Gamma GOF Tests on Detected Observations Only**											
280					A-D Test Statistic	0.214				**Anderson-Darling GOF Test**		
281					5% A-D Critical Value	0.74				Detected data appear Gamma Distributed at 5% Significance Level		
282					K-S Test Statistic	0.133				**Kolmogorov-Smirnov GOF**		
283					5% K-S Critical Value	0.248				Detected data appear Gamma Distributed at 5% Significance Level		
284	**Detected data appear Gamma Distributed at 5% Significance Level**											
285												
286	**Gamma Statistics on Detected Data Only**											
287					k hat (MLE)	2.418				k star (bias corrected MLE)		1.869
288					Theta hat (MLE)	0.245				Theta star (bias corrected MLE)		0.317
289					nu hat (MLE)	58.03				nu star (bias corrected)		44.86
290					MLE Mean (bias corrected)	0.593						
291					MLE Sd (bias corrected)	0.434				95% Percentile of Chisquare (2kstar)		9.06
292												
293	**Gamma ROS Statistics using Imputed Non-Detects**											
294	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
295	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
296	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
297	This is especially true when the sample size is small.											
298	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
299					Minimum	0.01				Mean		0.429
300					Maximum	1.65				Median		0.33
301					SD	0.433				CV		1.008
302					k hat (MLE)	0.743				k star (bias corrected MLE)		0.651
303					Theta hat (MLE)	0.578				Theta star (bias corrected MLE)		0.66
304					nu hat (MLE)	25.25				nu star (bias corrected)		22.12
305					MLE Mean (bias corrected)	0.429				MLE Sd (bias corrected)		0.532
306					95% Percentile of Chisquare (2kstar)	4.548				90% Percentile		1.096
307					95% Percentile	1.501				99% Percentile		2.472
308	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
309	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
310						WH	HW				WH	HW
311					95% Approx. Gamma UTL with 95% Coverage	2.591	3.163			95% Approx. Gamma UPL	1.616	1.817
312					95% Gamma USL	2.573	3.137					
313												
314	**Estimates of Gamma Parameters using KM Estimates**											
315					Mean (KM)	0.454				SD (KM)		0.397
316					Variance (KM)	0.158				SE of Mean (KM)		0.101
317					k hat (KM)	1.307				k star (KM)		1.116
318					nu hat (KM)	44.44				nu star (KM)		37.93
319					theta hat (KM)	0.347				theta star (KM)		0.407
320					80% gamma percentile (KM)	0.724				90% gamma percentile (KM)		1.018
321					95% gamma percentile (KM)	1.309				99% gamma percentile (KM)		1.98
322												
323	**The following statistics are computed using gamma distribution and KM estimates**											
324	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											

325					WH	HW					WH	HW
326	95% Approx. Gamma UTL with 95% Coverage				1.829	1.952	95% Approx. Gamma UPL				1.263	1.297
327	95% KM Gamma Percentile				1.156	1.179	95% Gamma USL				1.819	1.94
328												
329	**Lognormal GOF Test on Detected Observations Only**											
330	Shapiro Wilk Test Statistic				0.976		**Shapiro Wilk GOF Test**					
331	5% Shapiro Wilk Critical Value				0.859		Detected Data appear Lognormal at 5% Significance Level					
332	Lilliefors Test Statistic				0.134		**Lilliefors GOF Test**					
333	5% Lilliefors Critical Value				0.243		Detected Data appear Lognormal at 5% Significance Level					
334	**Detected Data appear Lognormal at 5% Significance Level**											
335												
336	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
337	Mean in Original Scale				0.455		Mean in Log Scale				-1.162	
338	SD in Original Scale				0.41		SD in Log Scale				0.919	
339	95% UTL95% Coverage				3.076		95% BCA UTL95% Coverage				1.65	
340	95% Bootstrap (%) UTL95% Coverage				1.65		95% UPL (t)				1.632	
341	90% Percentile (z)				1.016		95% Percentile (z)				1.42	
342	99% Percentile (z)				2.656		95% USL				3.045	
343												
344	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
345	KM Mean of Logged Data				-1.148		95% KM UTL (Lognormal)95% Coverage				2.649	
346	KM SD of Logged Data				0.854		95% KM UPL (Lognormal)				1.47	
347	95% KM Percentile Lognormal (z)				1.292		95% KM USL (Lognormal)				2.624	
348												
349	**Background DL/2 Statistics Assuming Lognormal Distribution**											
350	Mean in Original Scale				0.448		Mean in Log Scale				-1.202	
351	SD in Original Scale				0.415		SD in Log Scale				0.945	
352	95% UTL95% Coverage				3.148		95% UPL (t)				1.641	
353	90% Percentile (z)				1.009		95% Percentile (z)				1.422	
354	99% Percentile (z)				2.707		95% USL				3.115	
355	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
356												
357	**Nonparametric Distribution Free Background Statistics**											
358	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
359												
360	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
361	Order of Statistic, r				17		95% UTL with95% Coverage				1.65	
362	Approx, f used to compute achieved CC				0.895		Approximate Actual Confidence Coefficient achieved by UTL				0.582	
363	Approximate Sample Size needed to achieve specified CC				59		95% UPL				1.65	
364	95% USL				1.65		95% KM Chebyshev UPL				2.236	
365												
366	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
367	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
368	and consists of observations collected from clean unimpacted locations.											
369	The use of USL tends to provide a balance between false positives and false negatives provided the data											
370	represents a background data set and when many onsite observations need to be compared with the BTV.											
371												
372	**pH**											
373												
374	**General Statistics**											
375	Total Number of Observations				15		Number of Distinct Observations				15	
376							Number of Missing Observations				2	
377	Minimum				6.55		First Quartile				6.985	
378	Second Largest				9.25		Median				7.24	

379					Maximum	9.63				Third Quartile		8.13
380					Mean	7.591				SD		0.909
381					Coefficient of Variation	0.12				Skewness		1.209
382					Mean of logged Data	2.021				SD of logged Data		0.114
383												
384	**Critical Values for Background Threshold Values (BTVs)**											
385					Tolerance Factor K (For UTL)	2.566				d2max (for USL)		2.409
386												
387	**Normal GOF Test**											
388					Shapiro Wilk Test Statistic	0.856	**Shapiro Wilk GOF Test**					
389					5% Shapiro Wilk Critical Value	0.881	Data Not Normal at 5% Significance Level					
390					Lilliefors Test Statistic	0.288	**Lilliefors GOF Test**					
391					5% Lilliefors Critical Value	0.22	Data Not Normal at 5% Significance Level					
392	**Data Not Normal at 5% Significance Level**											
393												
394	**Background Statistics Assuming Normal Distribution**											
395					95% UTL with 95% Coverage	9.924				90% Percentile (z)		8.757
396					95% UPL (t)	9.245				95% Percentile (z)		9.087
397					95% USL	9.782				99% Percentile (z)		9.706
398												
399	**Gamma GOF Test**											
400					A-D Test Statistic	0.856	**Anderson-Darling Gamma GOF Test**					
401					5% A-D Critical Value	0.734	Data Not Gamma Distributed at 5% Significance Level					
402					K-S Test Statistic	0.284	**Kolmogorov-Smirnov Gamma GOF Test**					
403					5% K-S Critical Value	0.221	Data Not Gamma Distributed at 5% Significance Level					
404	**Data Not Gamma Distributed at 5% Significance Level**											
405												
406	**Gamma Statistics**											
407					k hat (MLE)	80.13				k star (bias corrected MLE)		64.15
408					Theta hat (MLE)	0.0947				Theta star (bias corrected MLE)		0.118
409					nu hat (MLE)	2404				nu star (bias corrected)		1925
410					MLE Mean (bias corrected)	7.591				MLE Sd (bias corrected)		0.948
411												
412	**Background Statistics Assuming Gamma Distribution**											
413					95% Wilson Hilferty (WH) Approx. Gamma UPL	9.266				90% Percentile		8.828
414					95% Hawkins Wixley (HW) Approx. Gamma UPL	9.269				95% Percentile		9.215
415					95% WH Approx. Gamma UTL with 95% Coverage	10.04				99% Percentile		9.969
416					95% HW Approx. Gamma UTL with 95% Coverage	10.05						
417					95% WH USL	9.87				95% HW USL		9.883
418												
419	**Lognormal GOF Test**											
420					Shapiro Wilk Test Statistic	0.882	**Shapiro Wilk Lognormal GOF Test**					
421					5% Shapiro Wilk Critical Value	0.881	Data appear Lognormal at 5% Significance Level					
422					Lilliefors Test Statistic	0.276	**Lilliefors Lognormal GOF Test**					
423					5% Lilliefors Critical Value	0.22	Data Not Lognormal at 5% Significance Level					
424	**Data appear Approximate Lognormal at 5% Significance Level**											
425												
426	**Background Statistics assuming Lognormal Distribution**											
427					95% UTL with 95% Coverage	10.1				90% Percentile (z)		8.729
428					95% UPL (t)	9.28				95% Percentile (z)		9.098
429					95% USL	9.924				99% Percentile (z)		9.831
430												
431	**Nonparametric Distribution Free Background Statistics**											
432	**Data appear Approximate Lognormal at 5% Significance Level**											

433												
434	**Nonparametric Upper Limits for Background Threshold Values**											
435					Order of Statistic, r	15				95% UTL with 95% Coverage		9.63
436					Approx, f used to compute achieved CC	0.789				Approximate Actual Confidence Coefficient achieved by UTL		0.537
437										Approximate Sample Size needed to achieve specified CC		59
438				95% Percentile Bootstrap UTL with 95% Coverage		9.63				95% BCA Bootstrap UTL with 95% Coverage		9.63
439					95% UPL	9.63				90% Percentile		8.862
440					90% Chebyshev UPL	10.41				95% Percentile		9.364
441					95% Chebyshev UPL	11.68				99% Percentile		9.577
442					95% USL	9.63						
443												
444	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
445	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
446	and consists of observations collected from clean unimpacted locations.											
447	The use of USL tends to provide a balance between false positives and false negatives provided the data											
448	represents a background data set and when many onsite observations need to be compared with the BTV.											
449												
450	**SO4**											
451												
452	**General Statistics**											
453					Total Number of Observations	15				Number of Missing Observations		1
454					Number of Distinct Observations	10						
455					Number of Detects	14				Number of Non-Detects		1
456					Number of Distinct Detects	9				Number of Distinct Non-Detects		1
457					Minimum Detect	75.7				Minimum Non-Detect		1
458					Maximum Detect	2740				Maximum Non-Detect		1
459					Variance Detected	794198				Percent Non-Detects		6.667%
460					Mean Detected	1717				SD Detected		891.2
461					Mean of Detected Logged Data	7.043				SD of Detected Logged Data		1.26
462												
463	**Critical Values for Background Threshold Values (BTVs)**											
464					Tolerance Factor K (For UTL)	2.566				d2max (for USL)		2.409
465												
466	**Normal GOF Test on Detects Only**											
467					Shapiro Wilk Test Statistic	0.732				**Shapiro Wilk GOF Test**		
468					5% Shapiro Wilk Critical Value	0.874				Data Not Normal at 5% Significance Level		
469					Lilliefors Test Statistic	0.367				**Lilliefors GOF Test**		
470					5% Lilliefors Critical Value	0.226				Data Not Normal at 5% Significance Level		
471	**Data Not Normal at 5% Significance Level**											
472												
473	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
474					KM Mean	1603				KM SD		933.5
475					95% UTL95% Coverage	3998				95% KM UPL (t)		3301
476					90% KM Percentile (z)	2799				95% KM Percentile (z)		3138
477					99% KM Percentile (z)	3774				95% KM USL		3851
478												
479	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
480					Mean	1602				SD		966.4
481					95% UTL95% Coverage	4082				95% UPL (t)		3360
482					90% Percentile (z)	2841				95% Percentile (z)		3192
483					99% Percentile (z)	3851				95% USL		3931
484	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
485												
486	**Gamma GOF Tests on Detected Observations Only**											

	A	B	C	D	E	F	G	H	I	J	K	L
487					A-D Test Statistic	2.687	**Anderson-Darling GOF Test**					
488					5% A-D Critical Value	0.753	Data Not Gamma Distributed at 5% Significance Level					
489					K-S Test Statistic	0.443	**Kolmogorov-Smirnov GOF**					
490					5% K-S Critical Value	0.233	Data Not Gamma Distributed at 5% Significance Level					
491	**Data Not Gamma Distributed at 5% Significance Level**											
492												
493	**Gamma Statistics on Detected Data Only**											
494					k hat (MLE)	1.376				k star (bias corrected MLE)		1.129
495					Theta hat (MLE)	1248				Theta star (bias corrected MLE)		1521
496					nu hat (MLE)	38.54				nu star (bias corrected)		31.61
497					MLE Mean (bias corrected)	1717						
498					MLE Sd (bias corrected)	1616				95% Percentile of Chisquare (2kstar)		6.482
499												
500	**Gamma ROS Statistics using Imputed Non-Detects**											
501	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
502	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
503	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
504	This is especially true when the sample size is small.											
505	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
506					Minimum	75.7				Mean		1656
507					Maximum	2740				Median		2000
508					SD	890.3				CV		0.538
509					k hat (MLE)	1.417				k star (bias corrected MLE)		1.178
510					Theta hat (MLE)	1169				Theta star (bias corrected MLE)		1406
511					nu hat (MLE)	42.51				nu star (bias corrected)		35.34
512					MLE Mean (bias corrected)	1656				MLE Sd (bias corrected)		1526
513					95% Percentile of Chisquare (2kstar)	6.664				90% Percentile		3663
514					95% Percentile	4685				99% Percentile		7032
515	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
516	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
517						WH	HW				WH	HW
518					95% Approx. Gamma UTL with 95% Coverage	7584	9109			95% Approx. Gamma UPL	5041	5659
519					95% Gamma USL	6991	8280					
520												
521	**Estimates of Gamma Parameters using KM Estimates**											
522					Mean (KM)	1603				SD (KM)		933.5
523					Variance (KM)	871508				SE of Mean (KM)		250.1
524					k hat (KM)	2.947				k star (KM)		2.402
525					nu hat (KM)	88.4				nu star (KM)		72.05
526					theta hat (KM)	543.8				theta star (KM)		667.2
527					80% gamma percentile (KM)	2347				90% gamma percentile (KM)		2987
528					95% gamma percentile (KM)	3591				99% gamma percentile (KM)		4917
529												
530	**The following statistics are computed using gamma distribution and KM estimates**											
531	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
532						WH	HW				WH	HW
533					95% Approx. Gamma UTL with 95% Coverage	9244	12436			95% Approx. Gamma UPL	5770	7008
534					95% KM Gamma Percentile	5110	6054			95% Gamma USL	8422	11098
535												
536	**Lognormal GOF Test on Detected Observations Only**											
537					Shapiro Wilk Test Statistic	0.615	**Shapiro Wilk GOF Test**					
538					5% Shapiro Wilk Critical Value	0.874	Data Not Lognormal at 5% Significance Level					
539					Lilliefors Test Statistic	0.442	**Lilliefors GOF Test**					
540					5% Lilliefors Critical Value	0.226	Data Not Lognormal at 5% Significance Level					

541	**Data Not Lognormal at 5% Significance Level**											
542												
543	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
544					Mean in Original Scale	1610				Mean in Log Scale	6.885	
545					SD in Original Scale	954.1				SD in Log Scale	1.36	
546					95% UTL95% Coverage	32012				95% BCA UTL95% Coverage	2740	
547					95% Bootstrap (%) UTL95% Coverage	2740				95% UPL (t)	11595	
548					90% Percentile (z)	5583				95% Percentile (z)	9149	
549					99% Percentile (z)	23110				95% USL	25860	
550												
551	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
552					KM Mean of Logged Data	6.573				95% KM UTL (Lognormal)95% Coverage	161793	
553					KM SD of Logged Data	2.113				95% KM UPL (Lognormal)	33396	
554					95% KM Percentile Lognormal (z)	23113				95% KM USL (Lognormal)	116133	
555												
556	**Background DL/2 Statistics Assuming Lognormal Distribution**											
557					Mean in Original Scale	1602				Mean in Log Scale	6.527	
558					SD in Original Scale	966.4				SD in Log Scale	2.338	
559					95% UTL95% Coverage	275256				95% UPL (t)	48023	
560					90% Percentile (z)	13670				95% Percentile (z)	31958	
561					99% Percentile (z)	157195				95% USL	190716	
562	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
563												
564	**Nonparametric Distribution Free Background Statistics**											
565	**Data do not follow a Discernible Distribution (0.05)**											
566												
567	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
568					Order of Statistic, r	15				95% UTL with95% Coverage	2740	
569					Approx, f used to compute achieved CC	0.789				Approximate Actual Confidence Coefficient achieved by UTL	0.537	
570					Approximate Sample Size needed to achieve specified CC	59				95% UPL	2740	
571					95% USL	2740				95% KM Chebyshev UPL	5805	
572												
573	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
574	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
575	and consists of observations collected from clean unimpacted locations.											
576	The use of USL tends to provide a balance between false positives and false negatives provided the data											
577	represents a background data set and when many onsite observations need to be compared with the BTV.											
578												
579	**TDS**											
580												
581	**General Statistics**											
582					Total Number of Observations	17				Number of Distinct Observations	13	
583					Minimum	384				First Quartile	3250	
584					Second Largest	3600				Median	3400	
585					Maximum	3900				Third Quartile	3600	
586					Mean	2788				SD	1315	
587					Coefficient of Variation	0.472				Skewness	-1.324	
588					Mean of logged Data	7.698				SD of logged Data	0.857	
589												
590	**Critical Values for Background Threshold Values (BTVs)**											
591					Tolerance Factor K (For UTL)	2.486				d2max (for USL)	2.475	
592												
593	**Normal GOF Test**											
594					Shapiro Wilk Test Statistic	0.647				**Shapiro Wilk GOF Test**		

	A	B	C	D	E	F	G	H	I	J	K	L
595					5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level					
596					Lilliefors Test Statistic	0.402	**Lilliefors GOF Test**					
597					5% Lilliefors Critical Value	0.207	Data Not Normal at 5% Significance Level					
598	**Data Not Normal at 5% Significance Level**											
599												
600	**Background Statistics Assuming Normal Distribution**											
601				95% UTL with	95% Coverage	6056				90% Percentile (z)		4473
602					95% UPL (t)	5150				95% Percentile (z)		4950
603					95% USL	6041				99% Percentile (z)		5846
604												
605	**Gamma GOF Test**											
606					A-D Test Statistic	3.421	**Anderson-Darling Gamma GOF Test**					
607					5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level					
608					K-S Test Statistic	0.441	**Kolmogorov-Smirnov Gamma GOF Test**					
609					5% K-S Critical Value	0.211	Data Not Gamma Distributed at 5% Significance Level					
610	**Data Not Gamma Distributed at 5% Significance Level**											
611												
612	**Gamma Statistics**											
613					k hat (MLE)	2.283				k star (bias corrected MLE)		1.919
614					Theta hat (MLE)	1221				Theta star (bias corrected MLE)		1452
615					nu hat (MLE)	77.62				nu star (bias corrected)		65.25
616					MLE Mean (bias corrected)	2788				MLE Sd (bias corrected)		2012
617												
618	**Background Statistics Assuming Gamma Distribution**											
619				95% Wilson Hilferty (WH) Approx. Gamma UPL		7046				90% Percentile		5475
620				95% Hawkins Wixley (HW) Approx. Gamma UPL		7559				95% Percentile		6699
621				95% WH Approx. Gamma UTL with	95% Coverage	9748				99% Percentile		9422
622				95% HW Approx. Gamma UTL with	95% Coverage	10913						
623					95% WH USL	9699				95% HW USL		10851
624												
625	**Lognormal GOF Test**											
626					Shapiro Wilk Test Statistic	0.607	**Shapiro Wilk Lognormal GOF Test**					
627					5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level					
628					Lilliefors Test Statistic	0.439	**Lilliefors Lognormal GOF Test**					
629					5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level					
630	**Data Not Lognormal at 5% Significance Level**											
631												
632	**Background Statistics assuming Lognormal Distribution**											
633				95% UTL with	95% Coverage	18576				90% Percentile (z)		6614
634					95% UPL (t)	10285				95% Percentile (z)		9031
635					95% USL	18399				99% Percentile (z)		16200
636												
637	**Nonparametric Distribution Free Background Statistics**											
638	**Data do not follow a Discernible Distribution (0.05)**											
639												
640	**Nonparametric Upper Limits for Background Threshold Values**											
641					Order of Statistic, r	17				95% UTL with	95% Coverage	3900
642					Approx, f used to compute achieved CC	0.895				Approximate Actual Confidence Coefficient achieved by UTL		0.582
643										Approximate Sample Size needed to achieve specified CC		59
644				95% Percentile Bootstrap UTL with	95% Coverage	3900				95% BCA Bootstrap UTL with	95% Coverage	3900
645					95% UPL	3900				90% Percentile		3600
646					90% Chebyshev UPL	6846				95% Percentile		3660
647					95% Chebyshev UPL	8685				99% Percentile		3852
648					95% USL	3900						

	A	B	C	D	E	F	G	H	I	J	K	L
649												
650	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
651	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
652	and consists of observations collected from clean unimpacted locations.											
653	The use of USL tends to provide a balance between false positives and false negatives provided the data											
654	represents a background data set and when many onsite observations need to be compared with the BTV.											
655												

1				Background Statistics for Data Sets with Non-Detects								
2		User Selected Options										
3		Date/Time of Computation		ProUCL 5.11/27/2020 11:03:25 AM								
4		From File		Ash Landfill ProUCL Input 2019.xls								
5		Full Precision		OFF								
6		Confidence Coefficient		95%								
7		Coverage		95%								
8		Different or Future K Observations		1								
9		Number of Bootstrap Operations		2000								
10												
11	As											
12												
13					General Statistics							
14				Total Number of Observations	17			Number of Missing Observations	0			
15				Number of Distinct Observations	3							
16				Number of Detects	3			Number of Non-Detects	14			
17				Number of Distinct Detects	1			Number of Distinct Non-Detects	3			
18				Minimum Detect	0.001			Minimum Non-Detect	0.001			
19				Maximum Detect	0.001			Maximum Non-Detect	0.004			
20				Variance Detected	0			Percent Non-Detects	82.35%			
21				Mean Detected	0.001			SD Detected	0			
22				Mean of Detected Logged Data	-6.908			SD of Detected Logged Data	0			
23												
24				Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
25				It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
26												
27				The data set for variable As was not processed!								
28												
29												
30	Ba											
31												
32	General Statistics											
33				Total Number of Observations	17			Number of Distinct Observations	8			
34				Minimum	0.008			First Quartile	0.009			
35				Second Largest	0.067			Median	0.01			
36				Maximum	0.072			Third Quartile	0.012			
37				Mean	0.0232			SD	0.025			
38				Coefficient of Variation	1.079			Skewness	1.389			
39				Mean of logged Data	-4.182			SD of logged Data	0.849			
40												
41					Critical Values for Background Threshold Values (BTVs)							
42				Tolerance Factor K (For UTL)	2.486			d2max (for USL)	2.475			
43												
44					Normal GOF Test							
45				Shapiro Wilk Test Statistic	0.59			Shapiro Wilk GOF Test				
46				5% Shapiro Wilk Critical Value	0.892			Data Not Normal at 5% Significance Level				
47				Lilliefors Test Statistic	0.437			Lilliefors GOF Test				
48				5% Lilliefors Critical Value	0.207			Data Not Normal at 5% Significance Level				
49					Data Not Normal at 5% Significance Level							
50												
51					Background Statistics Assuming Normal Distribution							
52				95% UTL with 95% Coverage	0.0854			90% Percentile (z)	0.0552			
53				95% UPL (t)	0.0681			95% Percentile (z)	0.0643			
54				95% USL	0.0851			99% Percentile (z)	0.0814			

55												
56	**Gamma GOF Test**											
57					A-D Test Statistic	3.26	**Anderson-Darling Gamma GOF Test**					
58					5% A-D Critical Value	0.759	Data Not Gamma Distributed at 5% Significance Level					
59					K-S Test Statistic	0.414	**Kolmogorov-Smirnov Gamma GOF Test**					
60					5% K-S Critical Value	0.214	Data Not Gamma Distributed at 5% Significance Level					
61	**Data Not Gamma Distributed at 5% Significance Level**											
62												
63	**Gamma Statistics**											
64					k hat (MLE)	1.341			k star (bias corrected MLE)	1.143		
65					Theta hat (MLE)	0.0173			Theta star (bias corrected MLE)	0.0203		
66					nu hat (MLE)	45.58			nu star (bias corrected)	38.87		
67					MLE Mean (bias corrected)	0.0232			MLE Sd (bias corrected)	0.0217		
68												
69	**Background Statistics Assuming Gamma Distribution**											
70					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.069			90% Percentile	0.0516		
71					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.0693			95% Percentile	0.0662		
72					95% WH Approx. Gamma UTL with 95% Coverage	0.103			99% Percentile	0.0998		
73					95% HW Approx. Gamma UTL with 95% Coverage	0.107						
74					95% WH USL	0.102			95% HW USL	0.106		
75												
76	**Lognormal GOF Test**											
77					Shapiro Wilk Test Statistic	0.65	**Shapiro Wilk Lognormal GOF Test**					
78					5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level					
79					Lilliefors Test Statistic	0.376	**Lilliefors Lognormal GOF Test**					
80					5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level					
81	**Data Not Lognormal at 5% Significance Level**											
82												
83	**Background Statistics assuming Lognormal Distribution**											
84					95% UTL with 95% Coverage	0.126			90% Percentile (z)	0.0453		
85					95% UPL (t)	0.0702			95% Percentile (z)	0.0617		
86					95% USL	0.125			99% Percentile (z)	0.11		
87												
88	**Nonparametric Distribution Free Background Statistics**											
89	**Data do not follow a Discernible Distribution (0.05)**											
90												
91	**Nonparametric Upper Limits for Background Threshold Values**											
92					Order of Statistic, r	17			95% UTL with 95% Coverage	0.072		
93					Approx, f used to compute achieved CC	0.895			Approximate Actual Confidence Coefficient achieved by UTL	0.582		
94									Approximate Sample Size needed to achieve specified CC	59		
95					95% Percentile Bootstrap UTL with 95% Coverage	0.072			95% BCA Bootstrap UTL with 95% Coverage	0.072		
96					95% UPL	0.072			90% Percentile	0.067		
97					90% Chebyshev UPL	0.1			95% Percentile	0.068		
98					95% Chebyshev UPL	0.135			99% Percentile	0.0712		
99					95% USL	0.072						
100												
101	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
102	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
103	and consists of observations collected from clean unimpacted locations.											
104	The use of USL tends to provide a balance between false positives and false negatives provided the data											
105	represents a background data set and when many onsite observations need to be compared with the BTV.											
106												
107	**Be**											
108												

	A	B	C	D	E	F	G	H	I	J	K	L
109	**General Statistics**											
110					Total Number of Observations	17			Number of Missing Observations			0
111					Number of Distinct Observations	2						
112					Number of Detects	0			Number of Non-Detects			17
113					Number of Distinct Detects	0			Number of Distinct Non-Detects			2
114					Minimum Detect	N/A			Minimum Non-Detect			0.001
115					Maximum Detect	N/A			Maximum Non-Detect			0.002
116					Variance Detected	N/A			Percent Non-Detects			100%
117					Mean Detected	N/A			SD Detected			N/A
118					Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A
119												
120	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
121	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
122	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
123												
124	**The data set for variable Be was not processed!**											
125												
126												
127	**Cd**											
128												
129	**General Statistics**											
130					Total Number of Observations	17			Number of Missing Observations			0
131					Number of Distinct Observations	4						
132					Number of Detects	0			Number of Non-Detects			17
133					Number of Distinct Detects	0			Number of Distinct Non-Detects			4
134					Minimum Detect	N/A			Minimum Non-Detect			1.0000E-4
135					Maximum Detect	N/A			Maximum Non-Detect			0.002
136					Variance Detected	N/A			Percent Non-Detects			100%
137					Mean Detected	N/A			SD Detected			N/A
138					Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A
139												
140	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
141	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
142	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
143												
144	**The data set for variable Cd was not processed!**											
145												
146												
147	**Co**											
148												
149	**General Statistics**											
150					Total Number of Observations	17			Number of Missing Observations			0
151					Number of Distinct Observations	3						
152					Number of Detects	0			Number of Non-Detects			17
153					Number of Distinct Detects	0			Number of Distinct Non-Detects			3
154					Minimum Detect	N/A			Minimum Non-Detect			0.001
155					Maximum Detect	N/A			Maximum Non-Detect			0.004
156					Variance Detected	N/A			Percent Non-Detects			100%
157					Mean Detected	N/A			SD Detected			N/A
158					Mean of Detected Logged Data	N/A			SD of Detected Logged Data			N/A
159												
160	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
161	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
162	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											

163												
164	**The data set for variable Co was not processed!**											
165												
166												
167	**Cr**											
168												
169	**General Statistics**											
170						Total Number of Observations	17			Number of Missing Observations	0	
171						Number of Distinct Observations	5					
172						Number of Detects	4			Number of Non-Detects	13	
173						Number of Distinct Detects	3			Number of Distinct Non-Detects	3	
174						Minimum Detect	0.002			Minimum Non-Detect	0.001	
175						Maximum Detect	0.042			Maximum Non-Detect	0.004	
176						Variance Detected	3.9358E-4			Percent Non-Detects	76.47%	
177						Mean Detected	0.0123			SD Detected	0.0198	
178						Mean of Detected Logged Data	-5.352			SD of Detected Logged Data	1.467	
179												
180	**Critical Values for Background Threshold Values (BTVs)**											
181						Tolerance Factor K (For UTL)	2.486			d2max (for USL)	2.475	
182												
183	**Normal GOF Test on Detects Only**											
184						Shapiro Wilk Test Statistic	0.648			**Shapiro Wilk GOF Test**		
185						5% Shapiro Wilk Critical Value	0.748			Data Not Normal at 5% Significance Level		
186						Lilliefors Test Statistic	0.429			**Lilliefors GOF Test**		
187						5% Lilliefors Critical Value	0.375			Data Not Normal at 5% Significance Level		
188	**Data Not Normal at 5% Significance Level**											
189												
190	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
191						KM Mean	0.00367			KM SD	0.0096	
192						95% UTL95% Coverage	0.0275			95% KM UPL (t)	0.0209	
193						90% KM Percentile (z)	0.016			95% KM Percentile (z)	0.0195	
194						99% KM Percentile (z)	0.026			95% KM USL	0.0274	
195												
196	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
197						Mean	0.00341			SD	0.00998	
198						95% UTL95% Coverage	0.0282			95% UPL (t)	0.0213	
199						90% Percentile (z)	0.0162			95% Percentile (z)	0.0198	
200						99% Percentile (z)	0.0266			95% USL	0.0281	
201	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
202												
203	**Gamma GOF Tests on Detected Observations Only**											
204						A-D Test Statistic	0.797			**Anderson-Darling GOF Test**		
205						5% A-D Critical Value	0.675			Data Not Gamma Distributed at 5% Significance Level		
206						K-S Test Statistic	0.431			**Kolmogorov-Smirnov GOF**		
207						5% K-S Critical Value	0.407			Data Not Gamma Distributed at 5% Significance Level		
208	**Data Not Gamma Distributed at 5% Significance Level**											
209												
210	**Gamma Statistics on Detected Data Only**											
211						k hat (MLE)	0.644			k star (bias corrected MLE)	0.328	
212						Theta hat (MLE)	0.019			Theta star (bias corrected MLE)	0.0374	
213						nu hat (MLE)	5.151			nu star (bias corrected)	2.621	
214						MLE Mean (bias corrected)	0.0123					
215						MLE Sd (bias corrected)	0.0214			95% Percentile of Chisquare (2kstar)	2.913	
216												

	A	B	C	D	E	F	G	H	I	J	K	L
217	**Gamma ROS Statistics using Imputed Non-Detects**											
218	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
219	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
220	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
221	This is especially true when the sample size is small.											
222	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
223					Minimum	0.002				Mean	0.0105	
224					Maximum	0.042				Median	0.01	
225					SD	0.00865				CV	0.821	
226					k hat (MLE)	2.353				k star (bias corrected MLE)	1.977	
227					Theta hat (MLE)	0.00448				Theta star (bias corrected MLE)	0.00533	
228					nu hat (MLE)	79.99				nu star (bias corrected)	67.21	
229					MLE Mean (bias corrected)	0.0105				MLE Sd (bias corrected)	0.00749	
230					95% Percentile of Chisquare (2kstar)	9.412				90% Percentile	0.0205	
231					95% Percentile	0.0251				99% Percentile	0.0351	
232	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
233	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
234					WH	HW				WH	HW	
235				95% Approx. Gamma UTL with 95% Coverage	0.0357	0.0376			95% Approx. Gamma UPL	0.0259	0.0265	
236				95% Gamma USL	0.0355	0.0374						
237												
238	**Estimates of Gamma Parameters using KM Estimates**											
239					Mean (KM)	0.00367				SD (KM)	0.0096	
240					Variance (KM)	9.2127E-5				SE of Mean (KM)	0.00269	
241					k hat (KM)	0.146				k star (KM)	0.16	
242					nu hat (KM)	4.977				nu star (KM)	5.432	
243					theta hat (KM)	0.0251				theta star (KM)	0.023	
244					80% gamma percentile (KM)	0.0042				90% gamma percentile (KM)	0.011	
245					95% gamma percentile (KM)	0.02				99% gamma percentile (KM)	0.0457	
246												
247	**The following statistics are computed using gamma distribution and KM estimates**											
248	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
249					WH	HW				WH	HW	
250				95% Approx. Gamma UTL with 95% Coverage	0.0187	0.0174			95% Approx. Gamma UPL	0.0114	0.0103	
251				95% KM Gamma Percentile	0.0102	0.00909			95% Gamma USL	0.0186	0.0173	
252												
253	**Lognormal GOF Test on Detected Observations Only**											
254					Shapiro Wilk Test Statistic	0.723			**Shapiro Wilk GOF Test**			
255					5% Shapiro Wilk Critical Value	0.748			Data Not Lognormal at 5% Significance Level			
256					Lilliefors Test Statistic	0.372			**Lilliefors GOF Test**			
257					5% Lilliefors Critical Value	0.375			Detected Data appear Lognormal at 5% Significance Level			
258	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
259												
260	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
261					Mean in Original Scale	0.00298				Mean in Log Scale	-8.833	
262					SD in Original Scale	0.0101				SD in Log Scale	2.537	
263					95% UTL95% Coverage	0.0799				95% BCA UTL95% Coverage	0.042	
264					95% Bootstrap (%) UTL95% Coverage	0.042				95% UPL (t)	0.0139	
265					90% Percentile (z)	0.00376				95% Percentile (z)	0.00946	
266					99% Percentile (z)	0.0533				95% USL	0.0777	
267												
268	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
269					KM Mean of Logged Data	-6.525				95% KM UTL (Lognormal)95% Coverage	0.0139	
270					KM SD of Logged Data	0.903				95% KM UPL (Lognormal)	0.00743	

271	95% KM Percentile Lognormal (z)					0.00648	95% KM USL (Lognormal)					0.0137
272												
273	**Background DL/2 Statistics Assuming Lognormal Distribution**											
274	Mean in Original Scale					0.00341	Mean in Log Scale					-6.926
275	SD in Original Scale					0.00998	SD in Log Scale					1.174
276	95% UTL95% Coverage					0.0182	95% UPL (t)					0.0081
277	90% Percentile (z)					0.00442	95% Percentile (z)					0.00678
278	99% Percentile (z)					0.0151	95% USL					0.018
279	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
280												
281	**Nonparametric Distribution Free Background Statistics**											
282	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
283												
284	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
285	Order of Statistic, r					17	95% UTL with95% Coverage					0.042
286	Approx, f used to compute achieved CC					0.895	Approximate Actual Confidence Coefficient achieved by UTL					0.582
287	Approximate Sample Size needed to achieve specified CC					59	95% UPL					0.042
288	95% USL					0.042	95% KM Chebyshev UPL					0.0467
289												
290	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
291	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
292	and consists of observations collected from clean unimpacted locations.											
293	The use of USL tends to provide a balance between false positives and false negatives provided the data											
294	represents a background data set and when many onsite observations need to be compared with the BTV.											
295												
296	F											
297												
298	**General Statistics**											
299	Total Number of Observations					17	Number of Missing Observations					0
300	Number of Distinct Observations					12						
301	Number of Detects					12	Number of Non-Detects					5
302	Number of Distinct Detects					12	Number of Distinct Non-Detects					1
303	Minimum Detect					0.12	Minimum Non-Detect					0.2
304	Maximum Detect					1.65	Maximum Non-Detect					0.2
305	Variance Detected					0.172	Percent Non-Detects					29.41%
306	Mean Detected					0.593	SD Detected					0.415
307	Mean of Detected Logged Data					-0.743	SD of Detected Logged Data					0.719
308												
309	**Critical Values for Background Threshold Values (BTVs)**											
310	Tolerance Factor K (For UTL)					2.486	d2max (for USL)					2.475
311												
312	**Normal GOF Test on Detects Only**											
313	Shapiro Wilk Test Statistic					0.866	**Shapiro Wilk GOF Test**					
314	5% Shapiro Wilk Critical Value					0.859	Detected Data appear Normal at 5% Significance Level					
315	Lilliefors Test Statistic					0.193	**Lilliefors GOF Test**					
316	5% Lilliefors Critical Value					0.243	Detected Data appear Normal at 5% Significance Level					
317	**Detected Data appear Normal at 5% Significance Level**											
318												
319	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
320	KM Mean					0.454	KM SD					0.397
321	95% UTL95% Coverage					1.442	95% KM UPL (t)					1.168
322	90% KM Percentile (z)					0.963	95% KM Percentile (z)					1.107
323	99% KM Percentile (z)					1.378	95% KM USL					1.437
324												

	A	B	C	D	E	F	G	H	I	J	K	L
325	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
326					Mean	0.448				SD		0.415
327					95% UTL95% Coverage	1.479				95% UPL (t)		1.193
328					90% Percentile (z)	0.98				95% Percentile (z)		1.13
329					99% Percentile (z)	1.413				95% USL		1.474
330	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
331												
332	**Gamma GOF Tests on Detected Observations Only**											
333					A-D Test Statistic	0.214		**Anderson-Darling GOF Test**				
334					5% A-D Critical Value	0.74		Detected data appear Gamma Distributed at 5% Significance Level				
335					K-S Test Statistic	0.133		**Kolmogorov-Smirnov GOF**				
336					5% K-S Critical Value	0.248		Detected data appear Gamma Distributed at 5% Significance Level				
337	**Detected data appear Gamma Distributed at 5% Significance Level**											
338												
339	**Gamma Statistics on Detected Data Only**											
340					k hat (MLE)	2.418				k star (bias corrected MLE)		1.869
341					Theta hat (MLE)	0.245				Theta star (bias corrected MLE)		0.317
342					nu hat (MLE)	58.03				nu star (bias corrected)		44.86
343					MLE Mean (bias corrected)	0.593						
344					MLE Sd (bias corrected)	0.434				95% Percentile of Chisquare (2kstar)		9.06
345												
346	**Gamma ROS Statistics using Imputed Non-Detects**											
347	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
348	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
349	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
350	This is especially true when the sample size is small.											
351	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
352					Minimum	0.01				Mean		0.429
353					Maximum	1.65				Median		0.33
354					SD	0.433				CV		1.008
355					k hat (MLE)	0.743				k star (bias corrected MLE)		0.651
356					Theta hat (MLE)	0.578				Theta star (bias corrected MLE)		0.66
357					nu hat (MLE)	25.25				nu star (bias corrected)		22.12
358					MLE Mean (bias corrected)	0.429				MLE Sd (bias corrected)		0.532
359					95% Percentile of Chisquare (2kstar)	4.548				90% Percentile		1.096
360					95% Percentile	1.501				99% Percentile		2.472
361	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
362	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
363					WH	HW					WH	HW
364				95% Approx. Gamma UTL with 95% Coverage	2.591	3.163				95% Approx. Gamma UPL	1.616	1.817
365				95% Gamma USL	2.573	3.137						
366												
367	**Estimates of Gamma Parameters using KM Estimates**											
368					Mean (KM)	0.454				SD (KM)		0.397
369					Variance (KM)	0.158				SE of Mean (KM)		0.101
370					k hat (KM)	1.307				k star (KM)		1.116
371					nu hat (KM)	44.44				nu star (KM)		37.93
372					theta hat (KM)	0.347				theta star (KM)		0.407
373					80% gamma percentile (KM)	0.724				90% gamma percentile (KM)		1.018
374					95% gamma percentile (KM)	1.309				99% gamma percentile (KM)		1.98
375												
376	**The following statistics are computed using gamma distribution and KM estimates**											
377	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
378					WH	HW					WH	HW

	A	B	C	D	E	F	G	H	I	J	K	L
379	95% Approx. Gamma UTL with 95% Coverage				1.829	1.952	95% Approx. Gamma UPL				1.263	1.297
380	95% KM Gamma Percentile				1.156	1.179	95% Gamma USL				1.819	1.94
381												
382	**Lognormal GOF Test on Detected Observations Only**											
383	Shapiro Wilk Test Statistic					0.976	**Shapiro Wilk GOF Test**					
384	5% Shapiro Wilk Critical Value					0.859	Detected Data appear Lognormal at 5% Significance Level					
385	Lilliefors Test Statistic					0.134	**Lilliefors GOF Test**					
386	5% Lilliefors Critical Value					0.243	Detected Data appear Lognormal at 5% Significance Level					
387	**Detected Data appear Lognormal at 5% Significance Level**											
388												
389	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
390	Mean in Original Scale					0.455	Mean in Log Scale					-1.162
391	SD in Original Scale					0.41	SD in Log Scale					0.919
392	95% UTL95% Coverage					3.076	95% BCA UTL95% Coverage					1.65
393	95% Bootstrap (%) UTL95% Coverage					1.65	95% UPL (t)					1.632
394	90% Percentile (z)					1.016	95% Percentile (z)					1.42
395	99% Percentile (z)					2.656	95% USL					3.045
396												
397	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
398	KM Mean of Logged Data					-1.148	95% KM UTL (Lognormal)95% Coverage					2.649
399	KM SD of Logged Data					0.854	95% KM UPL (Lognormal)					1.47
400	95% KM Percentile Lognormal (z)					1.292	95% KM USL (Lognormal)					2.624
401												
402	**Background DL/2 Statistics Assuming Lognormal Distribution**											
403	Mean in Original Scale					0.448	Mean in Log Scale					-1.202
404	SD in Original Scale					0.415	SD in Log Scale					0.945
405	95% UTL95% Coverage					3.148	95% UPL (t)					1.641
406	90% Percentile (z)					1.009	95% Percentile (z)					1.422
407	99% Percentile (z)					2.707	95% USL					3.115
408	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
409												
410	**Nonparametric Distribution Free Background Statistics**											
411	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
412												
413	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
414	Order of Statistic, r					17	95% UTL with95% Coverage					1.65
415	Approx, f used to compute achieved CC					0.895	Approximate Actual Confidence Coefficient achieved by UTL					0.582
416	Approximate Sample Size needed to achieve specified CC					59	95% UPL					1.65
417	95% USL					1.65	95% KM Chebyshev UPL					2.236
418												
419	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
420	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
421	and consists of observations collected from clean unimpacted locations.											
422	The use of USL tends to provide a balance between false positives and false negatives provided the data											
423	represents a background data set and when many onsite observations need to be compared with the BTV.											
424												
425	**Hg**											
426												
427	**General Statistics**											
428	Total Number of Observations					17	Number of Missing Observations					0
429	Number of Distinct Observations					2						
430	Number of Detects					0	Number of Non-Detects					17
431	Number of Distinct Detects					0	Number of Distinct Non-Detects					2
432	Minimum Detect					N/A	Minimum Non-Detect					1.0000E-4

433					Maximum Detect	N/A					Maximum Non-Detect	2.0000E-4
434					Variance Detected	N/A					Percent Non-Detects	100%
435					Mean Detected	N/A					SD Detected	N/A
436					Mean of Detected Logged Data	N/A					SD of Detected Logged Data	N/A
437												
438	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
439	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
440	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
441												
442	**The data set for variable Hg was not processed!**											
443												
444												
445	**Li**											
446												
447	**General Statistics**											
448					Total Number of Observations	17					Number of Distinct Observations	16
449					Minimum	0.052					First Quartile	0.387
450					Second Largest	0.525					Median	0.402
451					Maximum	0.57					Third Quartile	0.41
452					Mean	0.344					SD	0.166
453					Coefficient of Variation	0.484					Skewness	-1.018
454					Mean of logged Data	-1.298					SD of logged Data	0.842
455												
456	**Critical Values for Background Threshold Values (BTVs)**											
457					Tolerance Factor K (For UTL)	2.486					d2max (for USL)	2.475
458												
459	**Normal GOF Test**											
460					Shapiro Wilk Test Statistic	0.76	**Shapiro Wilk GOF Test**					
461					5% Shapiro Wilk Critical Value	0.892	Data Not Normal at 5% Significance Level					
462					Lilliefors Test Statistic	0.367	**Lilliefors GOF Test**					
463					5% Lilliefors Critical Value	0.207	Data Not Normal at 5% Significance Level					
464	**Data Not Normal at 5% Significance Level**											
465												
466	**Background Statistics Assuming Normal Distribution**											
467					95% UTL with 95% Coverage	0.757					90% Percentile (z)	0.557
468					95% UPL (t)	0.643					95% Percentile (z)	0.617
469					95% USL	0.755					99% Percentile (z)	0.731
470												
471	**Gamma GOF Test**											
472					A-D Test Statistic	2.796	**Anderson-Darling Gamma GOF Test**					
473					5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level					
474					K-S Test Statistic	0.421	**Kolmogorov-Smirnov Gamma GOF Test**					
475					5% K-S Critical Value	0.211	Data Not Gamma Distributed at 5% Significance Level					
476	**Data Not Gamma Distributed at 5% Significance Level**											
477												
478	**Gamma Statistics**											
479					k hat (MLE)	2.321					k star (bias corrected MLE)	1.95
480					Theta hat (MLE)	0.148					Theta star (bias corrected MLE)	0.176
481					nu hat (MLE)	78.9					nu star (bias corrected)	66.31
482					MLE Mean (bias corrected)	0.344					MLE Sd (bias corrected)	0.246
483												
484	**Background Statistics Assuming Gamma Distribution**											
485					95% Wilson Hilferty (WH) Approx. Gamma UPL	0.864					90% Percentile	0.673
486					95% Hawkins Wixley (HW) Approx. Gamma UPL	0.924					95% Percentile	0.822

487	95% WH Approx. Gamma UTL with 95% Coverage					1.193					99% Percentile	1.154
488	95% HW Approx. Gamma UTL with 95% Coverage					1.33						
489					95% WH USL	1.187					95% HW USL	1.323
490												
491	**Lognormal GOF Test**											
492					Shapiro Wilk Test Statistic	0.66	**Shapiro Wilk Lognormal GOF Test**					
493					5% Shapiro Wilk Critical Value	0.892	Data Not Lognormal at 5% Significance Level					
494					Lilliefors Test Statistic	0.425	**Lilliefors Lognormal GOF Test**					
495					5% Lilliefors Critical Value	0.207	Data Not Lognormal at 5% Significance Level					
496	**Data Not Lognormal at 5% Significance Level**											
497												
498	**Background Statistics assuming Lognormal Distribution**											
499					95% UTL with 95% Coverage	2.216					90% Percentile (z)	0.804
500					95% UPL (t)	1.24					95% Percentile (z)	1.091
501					95% USL	2.195					99% Percentile (z)	1.937
502												
503	**Nonparametric Distribution Free Background Statistics**											
504	**Data do not follow a Discernible Distribution (0.05)**											
505												
506	**Nonparametric Upper Limits for Background Threshold Values**											
507					Order of Statistic, r	17					95% UTL with 95% Coverage	0.57
508					Approx, f used to compute achieved CC	0.895	Approximate Actual Confidence Coefficient achieved by UTL					0.582
509							Approximate Sample Size needed to achieve specified CC					59
510	95% Percentile Bootstrap UTL with 95% Coverage					0.57					95% BCA Bootstrap UTL with 95% Coverage	0.57
511					95% UPL	0.57					90% Percentile	0.474
512					90% Chebyshev UPL	0.857					95% Percentile	0.534
513					95% Chebyshev UPL	1.09					99% Percentile	0.563
514					95% USL	0.57						
515												
516	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample starts exceeding 20.											
517	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
518	and consists of observations collected from clean unimpacted locations.											
519	The use of USL tends to provide a balance between false positives and false negatives provided the data											
520	represents a background data set and when many onsite observations need to be compared with the BTV.											
521												
522	**Mo**											
523												
524	**General Statistics**											
525					Total Number of Observations	17					Number of Missing Observations	0
526					Number of Distinct Observations	8						
527					Number of Detects	5					Number of Non-Detects	12
528					Number of Distinct Detects	5					Number of Distinct Non-Detects	3
529					Minimum Detect	0.002					Minimum Non-Detect	0.001
530					Maximum Detect	0.056					Maximum Non-Detect	0.004
531					Variance Detected	4.4270E-4					Percent Non-Detects	70.59%
532					Mean Detected	0.0352					SD Detected	0.021
533					Mean of Detected Logged Data	-3.774					SD of Detected Logged Data	1.386
534												
535	**Critical Values for Background Threshold Values (BTVs)**											
536					Tolerance Factor K (For UTL)	2.486					d2max (for USL)	2.475
537												
538	**Normal GOF Test on Detects Only**											
539					Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**					
540					5% Shapiro Wilk Critical Value	0.762	Detected Data appear Normal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
541					Lilliefors Test Statistic	0.209	**Lilliefors GOF Test**					
542					5% Lilliefors Critical Value	0.343	Detected Data appear Normal at 5% Significance Level					
543	**Detected Data appear Normal at 5% Significance Level**											
544												
545	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
546					KM Mean	0.0111				KM SD	0.0186	
547					95% UTL95% Coverage	0.0574				95% KM UPL (t)	0.0445	
548					90% KM Percentile (z)	0.0349				95% KM Percentile (z)	0.0417	
549					99% KM Percentile (z)	0.0544				95% KM USL	0.0572	
550												
551	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
552					Mean	0.0109				SD	0.0193	
553					95% UTL95% Coverage	0.0589				95% UPL (t)	0.0456	
554					90% Percentile (z)	0.0356				95% Percentile (z)	0.0426	
555					99% Percentile (z)	0.0558				95% USL	0.0587	
556	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
557												
558	**Gamma GOF Tests on Detected Observations Only**											
559					A-D Test Statistic	0.692	**Anderson-Darling GOF Test**					
560					5% A-D Critical Value	0.688	Data Not Gamma Distributed at 5% Significance Level					
561					K-S Test Statistic	0.333	**Kolmogorov-Smirnov GOF**					
562					5% K-S Critical Value	0.363	Detected data appear Gamma Distributed at 5% Significance Level					
563	**Detected data follow Appr. Gamma Distribution at 5% Significance Level**											
564												
565	**Gamma Statistics on Detected Data Only**											
566					k hat (MLE)	1.313				k star (bias corrected MLE)	0.658	
567					Theta hat (MLE)	0.0268				Theta star (bias corrected MLE)	0.0535	
568					nu hat (MLE)	13.13				nu star (bias corrected)	6.585	
569					MLE Mean (bias corrected)	0.0352						
570					MLE Sd (bias corrected)	0.0434				95% Percentile of Chisquare (2kstar)	4.582	
571												
572	**Gamma ROS Statistics using Imputed Non-Detects**											
573	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
574	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
575	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
576	This is especially true when the sample size is small.											
577	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
578					Minimum	0.002				Mean	0.0174	
579					Maximum	0.056				Median	0.01	
580					SD	0.0158				CV	0.909	
581					k hat (MLE)	1.761				k star (bias corrected MLE)	1.49	
582					Theta hat (MLE)	0.00989				Theta star (bias corrected MLE)	0.0117	
583					nu hat (MLE)	59.88				nu star (bias corrected)	50.65	
584					MLE Mean (bias corrected)	0.0174				MLE Sd (bias corrected)	0.0143	
585					95% Percentile of Chisquare (2kstar)	7.779				90% Percentile	0.0363	
586					95% Percentile	0.0455				99% Percentile	0.0661	
587	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
588	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
589					WH	HW				WH	HW	
590	95% Approx. Gamma UTL with 95% Coverage				0.0677	0.0712	95% Approx. Gamma UPL			0.0473	0.0481	
591	95% Gamma USL				0.0674	0.0708						
592												
593	**Estimates of Gamma Parameters using KM Estimates**											
594					Mean (KM)	0.0111				SD (KM)	0.0186	

	A	B	C	D	E	F	G	H	I	J	K	L
595					Variance (KM)	3.4679E-4				SE of Mean (KM)		0.00505
596					k hat (KM)	0.353				k star (KM)		0.33
597					nu hat (KM)	12.01				nu star (KM)		11.23
598					theta hat (KM)	0.0313				theta star (KM)		0.0335
599					80% gamma percentile (KM)	0.0173				90% gamma percentile (KM)		0.0322
600					95% gamma percentile (KM)	0.0491				99% gamma percentile (KM)		0.0923
601												
602	**The following statistics are computed using gamma distribution and KM estimates**											
603	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
604					WH	HW					WH	HW
605	95% Approx. Gamma UTL with 95% Coverage				0.0761	0.0826	95% Approx. Gamma UPL				0.0432	0.043
606	95% KM Gamma Percentile				0.0375	0.0367	95% Gamma USL				0.0755	0.0818
607												
608	**Lognormal GOF Test on Detected Observations Only**											
609	Shapiro Wilk Test Statistic					0.71	**Shapiro Wilk GOF Test**					
610	5% Shapiro Wilk Critical Value					0.762	Data Not Lognormal at 5% Significance Level					
611	Lilliefors Test Statistic					0.367	**Lilliefors GOF Test**					
612	5% Lilliefors Critical Value					0.343	Data Not Lognormal at 5% Significance Level					
613	**Data Not Lognormal at 5% Significance Level**											
614												
615	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
616	Mean in Original Scale					0.0109	Mean in Log Scale					-6.746
617	SD in Original Scale					0.0193	SD in Log Scale					2.428
618	95% UTL95% Coverage					0.492	95% BCA UTL95% Coverage					0.056
619	95% Bootstrap (%) UTL95% Coverage					0.056	95% UPL (t)					0.0923
620	90% Percentile (z)					0.0264	95% Percentile (z)					0.0638
621	99% Percentile (z)					0.334	95% USL					0.479
622												
623	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
624	KM Mean of Logged Data					-5.979	95% KM UTL (Lognormal)95% Coverage					0.127
625	KM SD of Logged Data					1.576	95% KM UPL (Lognormal)					0.0429
626	95% KM Percentile Lognormal (z)					0.0338	95% KM USL (Lognormal)					0.125
627												
628	**Background DL/2 Statistics Assuming Lognormal Distribution**											
629	Mean in Original Scale					0.0109	Mean in Log Scale					-6.329
630	SD in Original Scale					0.0193	SD in Log Scale					1.88
631	95% UTL95% Coverage					0.191	95% UPL (t)					0.0523
632	90% Percentile (z)					0.0198	95% Percentile (z)					0.0393
633	99% Percentile (z)					0.142	95% USL					0.187
634	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
635												
636	**Nonparametric Distribution Free Background Statistics**											
637	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
638												
639	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
640	Order of Statistic, r					17	95% UTL with95% Coverage					0.056
641	Approx, f used to compute achieved CC					0.895	Approximate Actual Confidence Coefficient achieved by UTL					0.582
642	Approximate Sample Size needed to achieve specified CC					59	95% UPL					0.056
643	95% USL					0.056	95% KM Chebyshev UPL					0.0946
644												
645	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
646	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
647	and consists of observations collected from clean unimpacted locations.											
648	The use of USL tends to provide a balance between false positives and false negatives provided the data											

represents a background data set and when many onsite observations need to be compared with the BTV.

Pb

General Statistics

Total Number of Observations	17	Number of Missing Observations	0
Number of Distinct Observations	4		
Number of Detects	2	Number of Non-Detects	15
Number of Distinct Detects	2	Number of Distinct Non-Detects	3
Minimum Detect	0.001	Minimum Non-Detect	0.001
Maximum Detect	0.002	Maximum Non-Detect	0.004
Variance Detected	5.0000E-7	Percent Non-Detects	88.24%
Mean Detected	0.0015	SD Detected	7.0711E-4
Mean of Detected Logged Data	-6.561	SD of Detected Logged Data	0.49

Warning: Data set has only 2 Detected Values.

This is not enough to compute meaningful or reliable statistics and estimates.

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.486	d2max (for USL)	2.475

Normal GOF Test on Detects Only

Not Enough Data to Perform GOF Test

Kaplan Meier (KM) Background Statistics Assuming Normal Distribution

KM Mean	0.00107	KM SD	2.4944E-4
95% UTL95% Coverage	0.00169	95% KM UPL (t)	0.00151
90% KM Percentile (z)	0.00139	95% KM Percentile (z)	0.00148
99% KM Percentile (z)	0.00165	95% KM USL	0.00168

DL/2 Substitution Background Statistics Assuming Normal Distribution

Mean	7.6471E-4	SD	5.3379E-4
95% UTL95% Coverage	0.00209	95% UPL (t)	0.00172
90% Percentile (z)	0.00145	95% Percentile (z)	0.00164
99% Percentile (z)	0.00201	95% USL	0.00209

DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons

Gamma GOF Tests on Detected Observations Only

Not Enough Data to Perform GOF Test

Gamma Statistics on Detected Data Only

k hat (MLE)	8.653	k star (bias corrected MLE)	N/A
Theta hat (MLE)	1.7334E-4	Theta star (bias corrected MLE)	N/A
nu hat (MLE)	34.61	nu star (bias corrected)	N/A
MLE Mean (bias corrected)	N/A		
MLE Sd (bias corrected)	N/A	95% Percentile of Chisquare (2kstar)	N/A

Estimates of Gamma Parameters using KM Estimates

Mean (KM)	0.00107	SD (KM)	2.4944E-4
Variance (KM)	6.2222E-8	SE of Mean (KM)	9.1084E-5
k hat (KM)	18.29	k star (KM)	15.1
nu hat (KM)	621.7	nu star (KM)	513.3
theta hat (KM)	5.8333E-5	theta star (KM)	7.0649E-5

703				80% gamma percentile (KM)		0.00129				90% gamma percentile (KM)		0.00143
704				95% gamma percentile (KM)		0.00155				99% gamma percentile (KM)		0.00181
705												
706	**The following statistics are computed using gamma distribution and KM estimates**											
707	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
708					WH	HW					WH	HW
709	95% Approx. Gamma UTL with 95% Coverage				0.00164	0.00163	95% Approx. Gamma UPL				0.00146	0.00145
710	95% KM Gamma Percentile				0.00142	0.00141	95% Gamma USL				0.00163	0.00163
711												
712	**Lognormal GOF Test on Detected Observations Only**											
713	**Not Enough Data to Perform GOF Test**											
714												
715	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
716	Mean in Original Scale				2.5953E-4		Mean in Log Scale				-9.526	
717	SD in Original Scale				5.0902E-4		SD in Log Scale				1.666	
718	95% UTL95% Coverage				0.00459		95% BCA UTL95% Coverage				0.002	
719	95% Bootstrap (%) UTL95% Coverage				0.002		95% UPL (t)				0.00145	
720	90% Percentile (z)				6.1669E-4		95% Percentile (z)				0.00113	
721	99% Percentile (z)				0.00351		95% USL				0.0045	
722												
723	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
724	KM Mean of Logged Data				-6.862		95% KM UTL (Lognormal)95% Coverage				0.00161	
725	KM SD of Logged Data				0.173		95% KM UPL (Lognormal)				0.00143	
726	95% KM Percentile Lognormal (z)				0.00139		95% KM USL (Lognormal)				0.00161	
727												
728	**Background DL/2 Statistics Assuming Lognormal Distribution**											
729	Mean in Original Scale				7.6471E-4		Mean in Log Scale				-7.332	
730	SD in Original Scale				5.3379E-4		SD in Log Scale				0.519	
731	95% UTL95% Coverage				0.00237		95% UPL (t)				0.00166	
732	90% Percentile (z)				0.00127		95% Percentile (z)				0.00154	
733	99% Percentile (z)				0.00219		95% USL				0.00236	
734	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
735												
736	**Nonparametric Distribution Free Background Statistics**											
737	**Data do not follow a Discernible Distribution (0.05)**											
738												
739	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
740	Order of Statistic, r				17		95% UTL with95% Coverage				0.004	
741	Approx, f used to compute achieved CC				0.895		Approximate Actual Confidence Coefficient achieved by UTL				0.582	
742	Approximate Sample Size needed to achieve specified CC				59		95% UPL				0.004	
743	95% USL				0.004		95% KM Chebyshev UPL				0.00219	
744												
745	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
746	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
747	and consists of observations collected from clean unimpacted locations.											
748	The use of USL tends to provide a balance between false positives and false negatives provided the data											
749	represents a background data set and when many onsite observations need to be compared with the BTV.											
750												
751	**Ra**											
752												
753	**General Statistics**											
754	Total Number of Observations				15		Number of Missing Observations				2	
755	Number of Distinct Observations				15							
756	Number of Detects				12		Number of Non-Detects				3	

	A	B	C	D	E	F	G	H	I	J	K	L
757					Number of Distinct Detects	12				Number of Distinct Non-Detects		3
758					Minimum Detect	0.797				Minimum Non-Detect		0.48
759					Maximum Detect	3				Maximum Non-Detect		1.66
760					Variance Detected	0.544				Percent Non-Detects		20%
761					Mean Detected	1.473				SD Detected		0.738
762					Mean of Detected Logged Data	0.289				SD of Detected Logged Data		0.447
763												
764	**Critical Values for Background Threshold Values (BTVs)**											
765					Tolerance Factor K (For UTL)	2.566				d2max (for USL)		2.409
766												
767	**Normal GOF Test on Detects Only**											
768					Shapiro Wilk Test Statistic	0.824	**Shapiro Wilk GOF Test**					
769					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
770					Lilliefors Test Statistic	0.228	**Lilliefors GOF Test**					
771					5% Lilliefors Critical Value	0.243	Detected Data appear Normal at 5% Significance Level					
772	**Detected Data appear Approximate Normal at 5% Significance Level**											
773												
774	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
775					KM Mean	1.309				KM SD		0.726
776					95% UTL95% Coverage	3.172				95% KM UPL (t)		2.63
777					90% KM Percentile (z)	2.24				95% KM Percentile (z)		2.504
778					99% KM Percentile (z)	2.998				95% KM USL		3.058
779												
780	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
781					Mean	1.274				SD		0.783
782					95% UTL95% Coverage	3.282				95% UPL (t)		2.697
783					90% Percentile (z)	2.277				95% Percentile (z)		2.561
784					99% Percentile (z)	3.094				95% USL		3.159
785	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
786												
787	**Gamma GOF Tests on Detected Observations Only**											
788					A-D Test Statistic	0.625	**Anderson-Darling GOF Test**					
789					5% A-D Critical Value	0.732	Detected data appear Gamma Distributed at 5% Significance Level					
790					K-S Test Statistic	0.203	**Kolmogorov-Smirnov GOF**					
791					5% K-S Critical Value	0.246	Detected data appear Gamma Distributed at 5% Significance Level					
792	**Detected data appear Gamma Distributed at 5% Significance Level**											
793												
794	**Gamma Statistics on Detected Data Only**											
795					k hat (MLE)	5.236				k star (bias corrected MLE)		3.982
796					Theta hat (MLE)	0.281				Theta star (bias corrected MLE)		0.37
797					nu hat (MLE)	125.7				nu star (bias corrected)		95.58
798					MLE Mean (bias corrected)	1.473						
799					MLE Sd (bias corrected)	0.738				95% Percentile of Chisquare (2kstar)		15.46
800												
801	**Gamma ROS Statistics using Imputed Non-Detects**											
802	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
803	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
804	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
805	This is especially true when the sample size is small.											
806	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
807					Minimum	0.214				Mean		1.272
808					Maximum	3				Median		1
809					SD	0.793				CV		0.624
810					k hat (MLE)	2.456				k star (bias corrected MLE)		2.01

811					Theta hat (MLE)	0.518				Theta star (bias corrected MLE)		0.633
812					nu hat (MLE)	73.69				nu star (bias corrected)		60.29
813					MLE Mean (bias corrected)	1.272				MLE Sd (bias corrected)		0.897
814					95% Percentile of Chisquare (2kstar)	9.519				90% Percentile		2.47
815					95% Percentile	3.012				99% Percentile		4.212
816	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
817	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
818					WH	HW					WH	HW
819	95% Approx. Gamma UTL with 95% Coverage				4.446	4.815				95% Approx. Gamma UPL	3.159	3.297
820					95% Gamma USL	4.151	4.459					
821												
822	**Estimates of Gamma Parameters using KM Estimates**											
823					Mean (KM)	1.309				SD (KM)		0.726
824					Variance (KM)	0.527				SE of Mean (KM)		0.197
825					k hat (KM)	3.253				k star (KM)		2.646
826					nu hat (KM)	97.58				nu star (KM)		79.39
827					theta hat (KM)	0.403				theta star (KM)		0.495
828					80% gamma percentile (KM)	1.896				90% gamma percentile (KM)		2.388
829					95% gamma percentile (KM)	2.85				99% gamma percentile (KM)		3.859
830												
831	**The following statistics are computed using gamma distribution and KM estimates**											
832	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
833					WH	HW					WH	HW
834	95% Approx. Gamma UTL with 95% Coverage				3.696	3.824				95% Approx. Gamma UPL	2.771	2.809
835					95% KM Gamma Percentile	2.581	2.604			95% Gamma USL	3.487	3.591
836												
837	**Lognormal GOF Test on Detected Observations Only**											
838					Shapiro Wilk Test Statistic	0.9	**Shapiro Wilk GOF Test**					
839					5% Shapiro Wilk Critical Value	0.859	Detected Data appear Lognormal at 5% Significance Level					
840					Lilliefors Test Statistic	0.178	**Lilliefors GOF Test**					
841					5% Lilliefors Critical Value	0.243	Detected Data appear Lognormal at 5% Significance Level					
842	**Detected Data appear Lognormal at 5% Significance Level**											
843												
844	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
845					Mean in Original Scale	1.31				Mean in Log Scale		0.136
846					SD in Original Scale	0.744				SD in Log Scale		0.529
847					95% UTL95% Coverage	4.452				95% BCA UTL95% Coverage		3
848					95% Bootstrap (%) UTL95% Coverage	3				95% UPL (t)		2.999
849					90% Percentile (z)	2.257				95% Percentile (z)		2.735
850					99% Percentile (z)	3.922				95% USL		4.097
851												
852	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
853					KM Mean of Logged Data	0.129				95% KM UTL (Lognormal)95% Coverage		4.406
854					KM SD of Logged Data	0.528				95% KM UPL (Lognormal)		2.971
855					95% KM Percentile Lognormal (z)	2.71				95% KM USL (Lognormal)		4.056
856												
857	**Background DL/2 Statistics Assuming Lognormal Distribution**											
858					Mean in Original Scale	1.274				Mean in Log Scale		0.0546
859					SD in Original Scale	0.783				SD in Log Scale		0.671
860					95% UTL95% Coverage	5.905				95% UPL (t)		3.578
861					90% Percentile (z)	2.495				95% Percentile (z)		3.183
862					99% Percentile (z)	5.028				95% USL		5.315
863	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
864												

865	**Nonparametric Distribution Free Background Statistics**											
866	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
867												
868	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
869					Order of Statistic, r	15			95% UTL with95% Coverage	3		
870					Approx, f used to compute achieved CC	0.789			Approximate Actual Confidence Coefficient achieved by UTL	0.537		
871					Approximate Sample Size needed to achieve specified CC	59			95% UPL	3		
872					95% USL	3			95% KM Chebyshev UPL	4.578		
873												
874	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
875	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
876	and consists of observations collected from clean unimpacted locations.											
877	The use of USL tends to provide a balance between false positives and false negatives provided the data											
878	represents a background data set and when many onsite observations need to be compared with the BTV.											
879												
880	**Sb**											
881												
882	**General Statistics**											
883					Total Number of Observations	17			Number of Missing Observations	0		
884					Number of Distinct Observations	3						
885					Number of Detects	0			Number of Non-Detects	17		
886					Number of Distinct Detects	0			Number of Distinct Non-Detects	3		
887					Minimum Detect	N/A			Minimum Non-Detect	0.001		
888					Maximum Detect	N/A			Maximum Non-Detect	0.004		
889					Variance Detected	N/A			Percent Non-Detects	100%		
890					Mean Detected	N/A			SD Detected	N/A		
891					Mean of Detected Logged Data	N/A			SD of Detected Logged Data	N/A		
892												
893	**Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!**											
894	**Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!**											
895	**The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).**											
896												
897	**The data set for variable Sb was not processed!**											
898												
899												
900	**Se**											
901												
902	**General Statistics**											
903					Total Number of Observations	17			Number of Missing Observations	0		
904					Number of Distinct Observations	8						
905					Number of Detects	11			Number of Non-Detects	6		
906					Number of Distinct Detects	7			Number of Distinct Non-Detects	3		
907					Minimum Detect	0.001			Minimum Non-Detect	0.001		
908					Maximum Detect	0.034			Maximum Non-Detect	0.004		
909					Variance Detected	1.5976E-4			Percent Non-Detects	35.29%		
910					Mean Detected	0.0108			SD Detected	0.0126		
911					Mean of Detected Logged Data	-5.311			SD of Detected Logged Data	1.34		
912												
913	**Critical Values for Background Threshold Values (BTVs)**											
914					Tolerance Factor K (For UTL)	2.486			d2max (for USL)	2.475		
915												
916	**Normal GOF Test on Detects Only**											
917					Shapiro Wilk Test Statistic	0.736			**Shapiro Wilk GOF Test**			
918					5% Shapiro Wilk Critical Value	0.85			Data Not Normal at 5% Significance Level			

919					Lilliefors Test Statistic	0.368	**Lilliefors GOF Test**					
920					5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level					
921	**Data Not Normal at 5% Significance Level**											
922												
923	**Kaplan Meier (KM) Background Statistics Assuming Normal Distribution**											
924					KM Mean	0.00742				KM SD	0.0107	
925					95% UTL95% Coverage	0.0341				95% KM UPL (t)	0.0267	
926					90% KM Percentile (z)	0.0212				95% KM Percentile (z)	0.0251	
927					99% KM Percentile (z)	0.0324				95% KM USL	0.034	
928												
929	**DL/2 Substitution Background Statistics Assuming Normal Distribution**											
930					Mean	0.00732				SD	0.0111	
931					95% UTL95% Coverage	0.035				95% UPL (t)	0.0273	
932					90% Percentile (z)	0.0216				95% Percentile (z)	0.0256	
933					99% Percentile (z)	0.0332				95% USL	0.0349	
934	**DL/2 is not a recommended method. DL/2 provided for comparisons and historical reasons**											
935												
936	**Gamma GOF Tests on Detected Observations Only**											
937					A-D Test Statistic	1.372	**Anderson-Darling GOF Test**					
938					5% A-D Critical Value	0.762	Data Not Gamma Distributed at 5% Significance Level					
939					K-S Test Statistic	0.333	**Kolmogorov-Smirnov GOF**					
940					5% K-S Critical Value	0.265	Data Not Gamma Distributed at 5% Significance Level					
941	**Data Not Gamma Distributed at 5% Significance Level**											
942												
943	**Gamma Statistics on Detected Data Only**											
944					k hat (MLE)	0.762				k star (bias corrected MLE)	0.615	
945					Theta hat (MLE)	0.0142				Theta star (bias corrected MLE)	0.0176	
946					nu hat (MLE)	16.76				nu star (bias corrected)	13.52	
947					MLE Mean (bias corrected)	0.0108						
948					MLE Sd (bias corrected)	0.0138				95% Percentile of Chisquare (2kstar)	4.385	
949												
950	**Gamma ROS Statistics using Imputed Non-Detects**											
951	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
952	GROS may not be used when kstar of detects is small such as <1.0, especially when the sample size is small (e.g., <15-20)											
953	For such situations, GROS method may yield incorrect values of UCLs and BTVs											
954	This is especially true when the sample size is small.											
955	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
956					Minimum	0.001				Mean	0.0105	
957					Maximum	0.034				Median	0.01	
958					SD	0.01				CV	0.95	
959					k hat (MLE)	1.121				k star (bias corrected MLE)	0.963	
960					Theta hat (MLE)	0.00939				Theta star (bias corrected MLE)	0.0109	
961					nu hat (MLE)	38.12				nu star (bias corrected)	32.73	
962					MLE Mean (bias corrected)	0.0105				MLE Sd (bias corrected)	0.0107	
963					95% Percentile of Chisquare (2kstar)	5.846				90% Percentile	0.0245	
964					95% Percentile	0.032				99% Percentile	0.0494	
965	**The following statistics are computed using Gamma ROS Statistics on Imputed Data**											
966	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
967						WH	HW				WH	HW
968					95% Approx. Gamma UTL with 95% Coverage	0.0519	0.0578			95% Approx. Gamma UPL	0.0341	0.036
969					95% Gamma USL	0.0515	0.0574					
970												
971	**Estimates of Gamma Parameters using KM Estimates**											
972					Mean (KM)	0.00742				SD (KM)	0.0107	

	A	B	C	D	E	F	G	H	I	J	K	L
973					Variance (KM)	1.1522E-4				SE of Mean (KM)		0.00273
974					k hat (KM)	0.478				k star (KM)		0.433
975					nu hat (KM)	16.24				nu star (KM)		14.71
976					theta hat (KM)	0.0155				theta star (KM)		0.0171
977					80% gamma percentile (KM)	0.0121				90% gamma percentile (KM)		0.0207
978					95% gamma percentile (KM)	0.03				99% gamma percentile (KM)		0.0533
979												
980	**The following statistics are computed using gamma distribution and KM estimates**											
981	**Upper Limits using Wilson Hilferty (WH) and Hawkins Wixley (HW) Methods**											
982					WH	HW					WH	HW
983	95% Approx. Gamma UTL with 95% Coverage				0.0438	0.0469	95% Approx. Gamma UPL				0.0266	0.0268
984	95% KM Gamma Percentile				0.0236	0.0234	95% Gamma USL				0.0435	0.0465
985												
986	**Lognormal GOF Test on Detected Observations Only**											
987	Shapiro Wilk Test Statistic					0.785	**Shapiro Wilk GOF Test**					
988	5% Shapiro Wilk Critical Value					0.85	Data Not Lognormal at 5% Significance Level					
989	Lilliefors Test Statistic					0.295	**Lilliefors GOF Test**					
990	5% Lilliefors Critical Value					0.251	Data Not Lognormal at 5% Significance Level					
991	**Data Not Lognormal at 5% Significance Level**											
992												
993	**Background Lognormal ROS Statistics Assuming Lognormal Distribution Using Imputed Non-Detects**											
994	Mean in Original Scale					0.00719	Mean in Log Scale					-6.199
995	SD in Original Scale					0.0112	SD in Log Scale					1.709
996	95% UTL95% Coverage					0.142	95% BCA UTL95% Coverage					0.034
997	95% Bootstrap (%) UTL95% Coverage					0.034	95% UPL (t)					0.0437
998	90% Percentile (z)					0.0181	95% Percentile (z)					0.0338
999	99% Percentile (z)					0.108	95% USL					0.139
1000												
1001	**Statistics using KM estimates on Logged Data and Assuming Lognormal Distribution**											
1002	KM Mean of Logged Data					-5.83	95% KM UTL (Lognormal)95% Coverage					0.0667
1003	KM SD of Logged Data					1.256	95% KM UPL (Lognormal)					0.0281
1004	95% KM Percentile Lognormal (z)					0.0232	95% KM USL (Lognormal)					0.0658
1005												
1006	**Background DL/2 Statistics Assuming Lognormal Distribution**											
1007	Mean in Original Scale					0.00732	Mean in Log Scale					-5.973
1008	SD in Original Scale					0.0111	SD in Log Scale					1.452
1009	95% UTL95% Coverage					0.094	95% UPL (t)					0.0346
1010	90% Percentile (z)					0.0164	95% Percentile (z)					0.0277
1011	99% Percentile (z)					0.0746	95% USL					0.0925
1012	**DL/2 is not a Recommended Method. DL/2 provided for comparisons and historical reasons.**											
1013												
1014	**Nonparametric Distribution Free Background Statistics**											
1015	**Data do not follow a Discernible Distribution (0.05)**											
1016												
1017	**Nonparametric Upper Limits for BTVs(no distinction made between detects and nondetects)**											
1018	Order of Statistic, r					17	95% UTL with95% Coverage					0.034
1019	Approx, f used to compute achieved CC					0.895	Approximate Actual Confidence Coefficient achieved by UTL					0.582
1020	Approximate Sample Size needed to achieve specified CC					59	95% UPL					0.034
1021	95% USL					0.034	95% KM Chebyshev UPL					0.0556
1022												
1023	Note: The use of USL tends to yield a conservative estimate of BTV, especially when the sample size starts exceeding 20.											
1024	Therefore, one may use USL to estimate a BTV only when the data set represents a background data set free of outliers											
1025	and consists of observations collected from clean unimpacted locations.											
1026	The use of USL tends to provide a balance between false positives and false negatives provided the data											

represents a background data set and when many onsite observations need to be compared with the BTV.

TI

General Statistics

Total Number of Observations	17	Number of Missing Observations	0
Number of Distinct Observations	3		
Number of Detects	0	Number of Non-Detects	17
Number of Distinct Detects	0	Number of Distinct Non-Detects	3
Minimum Detect	N/A	Minimum Non-Detect	0.001
Maximum Detect	N/A	Maximum Non-Detect	0.004
Variance Detected	N/A	Percent Non-Detects	100%
Mean Detected	N/A	SD Detected	N/A
Mean of Detected Logged Data	N/A	SD of Detected Logged Data	N/A

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable TI was not processed!

▼File: Untitled1.syz

IMPORT successfully completed.

▼Descriptive Statistics reporting units in ug/L

	CO_BAT_5	SE_ASH_3	SE_ASH_4	SE_ASH_5	SE_ASH_7	LI_ASH_7
95.0% Lower Confidence Limit	8.1418	55.6848	34.8530	80.1236	81.4292	516.7096
95.0% Upper Confidence Limit	13.3515	87.0152	65.0898	98.6764	177.7458	565.7904